United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with West Virginia Agricultural and Forestry Experiment Station; United States Department of Agriculture, Forest Service; and Pocahontas County Commission

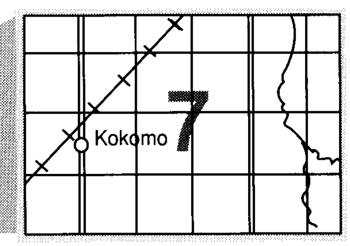
Soil Survey of Pocahontas County, West Virginia

How to Use This Soil Survey

General Soil Map

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

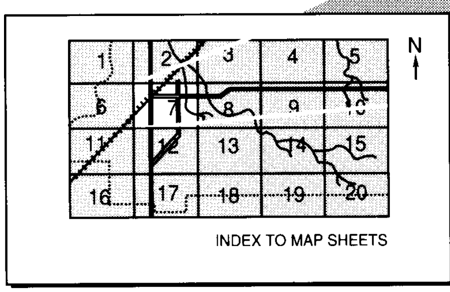
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.



MAP SHEET

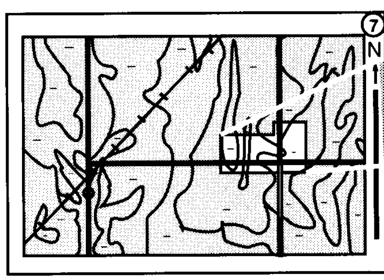
Detailed Soil Maps

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



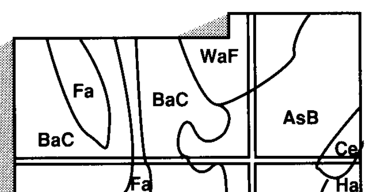
INDEX TO MAP SHEETS

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



MAP SHEET

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.



AREA OF INTEREST

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

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

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

Major fieldwork for this soil survey was completed in 1990. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1992. This survey was made cooperatively by the Natural Resources Conservation Service; the West Virginia Agricultural and Forestry Experiment Station; the United States Department of Agriculture, Forest Service; and the Pocahontas County Commission. The survey is part of the technical assistance furnished to the Greenbrier Valley Soil 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.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250 or call 1-800-245-6340 (voice) or 202-720-1127 (TDD). USDA is an equal employment opportunity employer.

Cover: A variety of landforms and land uses in the vicinity of Hillsboro, looking northeastward from the lookout tower at Droop Mountain Battlefield State Park.

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

Contents

Issued 1998

Foreword

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

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

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

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

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

William J. Hartman
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Pocahontas County, West Virginia

By Donald G. Flegel, Natural Resources Conservation Service

Soils surveyed by Donald G. Flegel[1], Mary Ellen Cook, Douglas A. Adamo, James W. Bell, and Quintin R. Johnson, Natural Resources Conservation Service; and Nancy Burt, Linton Wright, Jr., and Nancy Schlachter, Forest Service

Map finishing by D. Paul Amick, Debra Barnette, Linda Handley, and Denise Donelson, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
the West Virginia Agricultural and Forestry Experiment Station; the United States Department of Agriculture, Forest Service; and the Pocahontas County Commission

Pocahontas County is in the southeastern part of West Virginia (fig. 1). It has a total area of nearly 942 square miles, or 602,600 acres. The rugged mountainous terrain, where eight rivers find their source, lends the county its nickname “birthplace of rivers.” The Greenbrier River is the major river in the county. The population of Pocahontas County in 1990 was 8,973. The major enterprises in the county are agriculture, wood industries, small factories, and the tourism industry.

The transportation needs of Pocahontas County are served by Federal and State highways. U.S. Route 250 runs east-west in the northern part of the county, and U.S. Route 219 runs north-south through the center of the county. West Virginia Routes 92 and 28 run north-south in the eastern part of the county, and West Virginia Route 39 runs east-west through the center of the county.

This soil survey updates the survey of Pocahontas County, West Virginia, published in 1938 (Williams and Fridley 1938). It provides additional information and has larger maps, which show the soils in greater detail.

[1] Donald G. Flegel also surveyed soils as a volunteer for the Forest Service.

General Nature of the County

This section provides information about some of the natural and cultural factors that affect land use in the county. It describes settlement; farming; physiography, relief, and drainage; climate; and geology.

Settlement

Pocahontas County was formed in 1821 from parts of Bath, Pendleton, and Randolph Counties. In 1825, part of Greenbrier County was also added to Pocahontas County.

In 1749, Jacob Marlin and Steven Sewell settled in what is present day Marlinton. Marlin and Sewell, who were the first English settlers west of the Alleghenies, built their cabin on the low divide between Marlin Run and Knapp’s Creek.

In 1800, about 150 families lived in what is now Pocahontas County according to the census taken that year. The original county seat was designated as Huntersville in 1822. A special election was held in 1891 to authorize moving the location of the county seat to its present day location of Marlinton (Pocahontas County Historical Society, Inc. 1981).

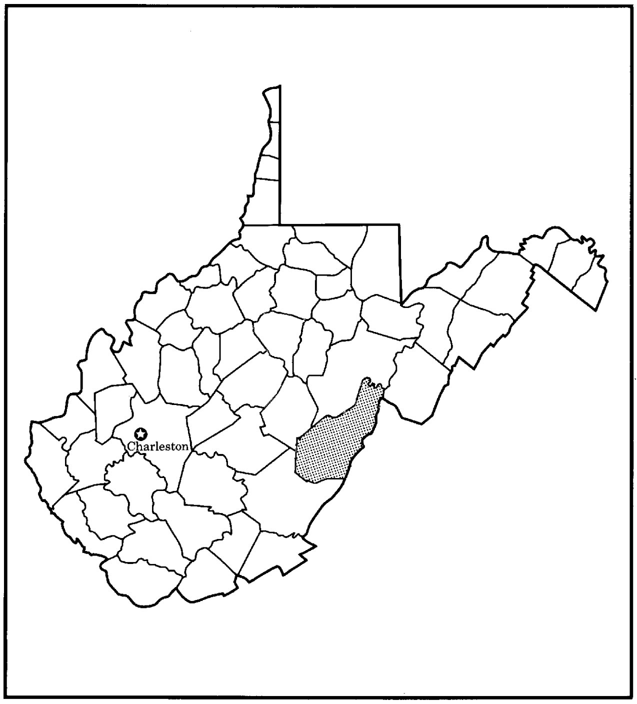


Figure 1.—Location of Pocahontas County in West Virginia.

Farming

In 1987, the county had 379 farms and a total of 118,540 acres of farmland (Colyer and Ferrise 1989). Between 1982 and 1987, the total acreage of farmland in the county decreased by 11,177 acres, but the average size of farms increased from 302 acres to 313 acres.

The main agricultural enterprises in the county are raising beef cattle and sheep and producing corn, oats, pasture, and hay. Raising cattle provides the greatest source of farm income. Most farms are operated on a part-time basis.

Physiography, Relief, and Drainage

Pocahontas County lies in both the Eastern Allegheny Plateau and Mountains and the Southern Appalachian Ridges and Valleys Major Land Resource Areas. The dividing line between these areas roughly follows the west side of the Greenbrier River.

The landforms of the county show the effects of orogenic movement coupled with erosional forces. Elevation, kind and position of rock, position of drainage courses, and climate are factors that also affect the type of topography in the county. The plateau and mountain area has nearly horizontal rocks that contain many resistant layers at the higher elevations with more weatherable rock below. This results in a dendritic drainage pattern. The ridge and valley area is slightly to strongly folded with resistant layers separated by large expanses of more weatherable rock. This results in a trellis drainage pattern.

The western part of the county, or plateau and mountain area, is generally higher in elevation and lower in temperature and has a greater amount of precipitation than that of the eastern part of the county, or ridge and valley area. As a result of these factors, a rugged and complicated relief exists (Price 1929). The highest and lowest elevations in the survey area are 4,842 feet at Bald Knob on Back Allegheny Mountain and 1,952 feet where the Greenbrier River flows out of the county.

Climate

Winters are cold and snowy at the higher elevations in Pocahontas County. They are also cold in the valleys, but intermittent thaws preclude a long-lasting snow cover. Summers are fairly warm on mountain slopes and very warm with occasional very hot days in the valleys. Rainfall is evenly distributed during the year, but it is appreciably heavier on the windward, west-facing slopes than in the valleys. Normal annual precipitation is adequate for all crops, although summer temperatures and the length of the growing season, particularly at the higher elevations, may be inadequate.

The divide of the Allegheny Mountains, the main topographic barrier of the Eastern Allegheny Plateau and Mountains, runs through the center of the county and forms a “rain shadow” that shelters the eastern half of the county from the prevailing storm systems that move from northwest to southeast. For this reason, climatic data recorded at Snowshoe in the western part of the county shows lower average temperatures and higher average precipitation than the data recorded at Buckeye in the eastern part of the county shows.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Buckeye in the period 1961 to 1990 and at Snowshoe in the period 1976 to 1992. Although the 16-year data record at Snowshoe is not long enough to generate a normal, it does indicate the effects of elevation in the county and adequately represents the contrasting climate. 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 29 degrees F at Buckeye and 23 degrees at Snowshoe. The average daily minimum temperature in winter is 17 degrees at

Buckeye and 15 degrees at Snowshoe. The lowest temperature on record, which occurred at Buckeye on January 21, 1985, is -26 degrees. In summer, the average temperature is 68 degrees at Buckeye and 62 degrees at Snowshoe. The average daily maximum temperature in summer is 81 degrees at Buckeye and 70 degrees at Snowshoe. The highest recorded temperature, which occurred at Buckeye on August 22, 1983, is 95 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 about 45 inches at Buckeye. Of this, about 23 inches, or nearly 52 percent, usually falls in April through September. The growing season for most crops falls within this period. The total annual precipitation is about 57 inches at Snowshoe. The heaviest 1-day rainfall during the period of record was 3.68 inches at Buckeye on November 5, 1985. Thunderstorms occur on about 44 days each year, and most occur in summer. Periods of heavy rainfall, which can occur throughout the year, and severe thunderstorms in summer can cause flash floods, particularly in narrow valleys.

The average seasonal snowfall is about 39 inches at Buckeye and about 156 inches at Snowshoe. The greatest snow depth at Buckeye at any one time during the period of record was 25 inches. On the average, 24 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 8 miles per hour, in spring.

Geology

Gordon Bayles, geologist, Natural Resources Conservation Service, and Linda Tracy, geologist, Forest Service, helped to prepare this section.

The surface rocks in the county are of sedimentary origin. The county can be divided into four areas that have somewhat different geologic features.

The area in the headwaters of the Cherry, Cranberry, Williams, Gauley, Elk, and Tygart Valley Rivers and Shavers Fork of the Cheat River is an eroded plateau where the ridgetops and upper side slopes are comprised of the Kanawha and New River Formations of the Pottsville Group of Pennsylvanian age. The middle and lower side slopes consist of the Bluestone, Princeton, Hinton, and Bluefield Formations of the Mauch Chunk Group of Mississippian age. The Pottsville Group on ridgetops usually consists of sandstone and conglomerate. The Gauley and Leatherbark soils are on this position. The Pottsville Group also includes yellow and brown shale and siltstone. With the Bluestone and Princeton Formations of the Mauch Chunk Group, Mandy soils are on the upper and middle side slopes and Snowdog and Trussel soils are on the foot slopes. The Gilbert, Hughes Ferry, and Sewell coals are the dominant minable seams in the Pottsville Group. Areas in the vicinity of Briery and Sharp Knobs have been stripmined. Briery soils are in these disturbed areas. The lower side slopes that are in the Hinton and Bluefield Formations of the Mauch Chunk Group are comprised mainly of red siltstone and shale. Cateache soils are on the side slopes, and Shouns soils are on the foot slopes.

The west-central part of the county includes the flats along the Greenbrier River to the area previously described. In the northern part of the county, the area west of the West Fork of the Greenbrier River and the area in the vicinity of the head of the East Fork of the Greenbrier River are also included. This area is comprised, in part, by the Bluefield Formation of the Mauch Chunk Group, which in the vicinity of Lobelia and Jacox exists as olive brown siltstone and shale. Culleoka soils are in this area of the county. Also in the areas of Droop and Woodrow, a massive sandstone exists that forms large flats having Lily, Dekalb, and Berks soils on them. The Greenbrier Group, which occurs directly below the Bluefield Formation, consists of limestone and calcareous shale. The Greenbrier reaches its maximum exposure in the Hillsboro area, also known as Little Levels. Belmont soils are on the side slopes, and Shouns soils are on foot slopes and benches. Lodi and Duffield soils are in the rolling area of Little Levels. The Maccrady Series consists primarily of red shale and siltstone and some thin-bedded sandstone. Cateache and Shouns soils are in areas of this geologic deposit. The Pocono Group consists of several hard sandstone members that form many of the ridges and flats near the Greenbrier River. It also includes some shale and siltstone. Berks and Dekalb soils are generally on the side slopes, and Lily soils are in the more level areas. This is especially evident in the area of the Brownsburg and Airport Roads. The area near the head of the East Fork of the

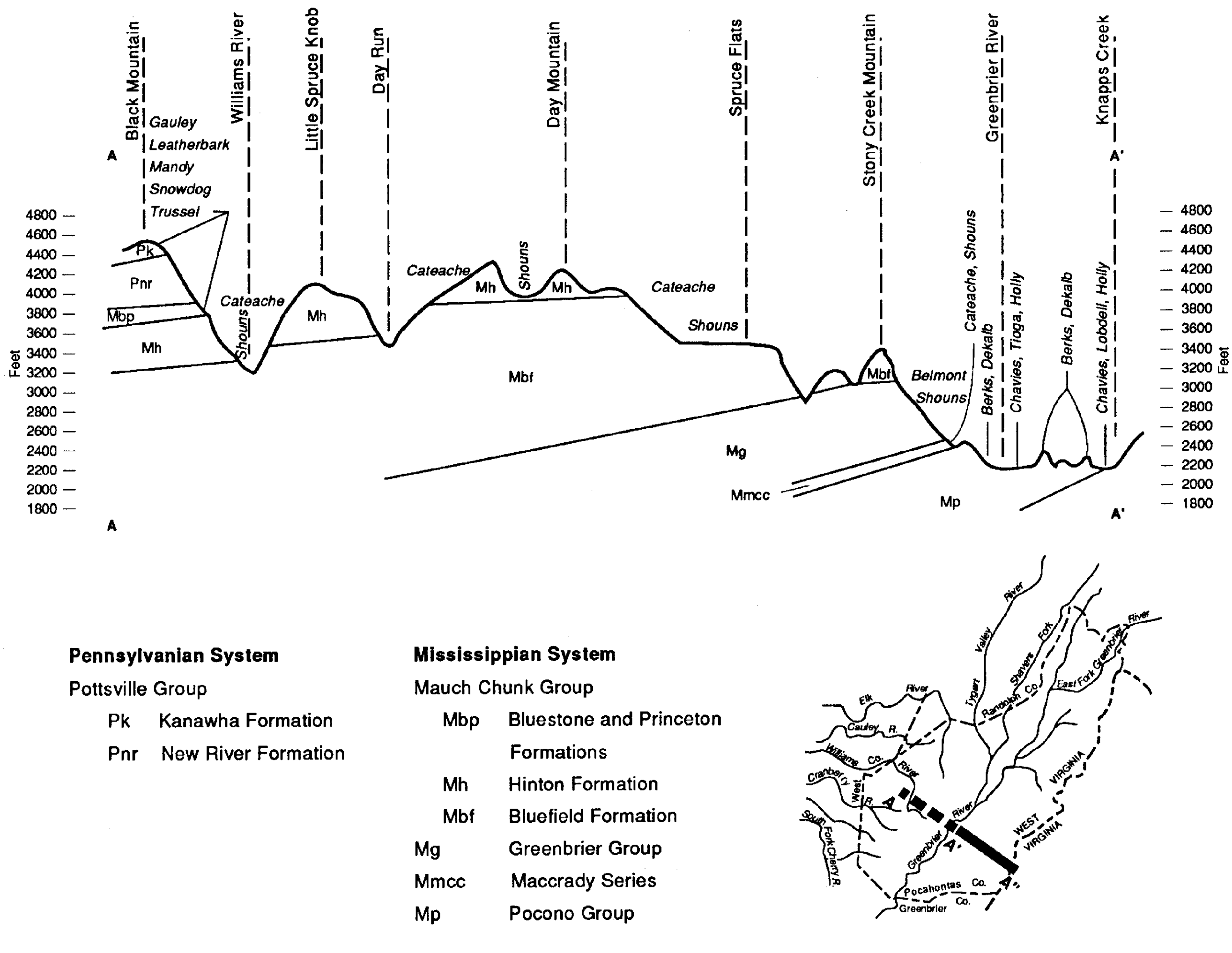


Figure 2.—Schematic cross section of the major geologic strata and dominant soils in Pocahontas County (A-A´).

Greenbrier River is a Pocono bench. The Mandy, Snowdog, and Trussel soils are in this area.

The remaining two areas are in the eastern half of the county. The area containing the oldest rock in the county starts at Green Bank and extends southwestward generally staying between West Virginia Routes 28 and 92 and extending down into Greenbrier County. This area is highly folded and is comprised of lower Devonian, Silurian, and Ordovician aged rocks. The Huntersville Chert and the Oriskany Formation, which is comprised of massive sandstone, form the flanks of this area and occasionally outcrop in the Browns Mountain area because of the extensive folding that has taken place. Elliber, Dekalb, and Hazleton soils are in areas of these geologic deposits. The Helderberg Group is comprised primarily of limestone. The dominant soil is Faywood. Blackthorn soils are in areas where the limestone has been blanketed by coarse colluvial material. The Silurian age materials are made up of the Cayugan Series, the McKenzie Formation, the Clinton Group, and the Tuscarora Sandstone. The Cayugan Series is comprised of thin-bedded, platy limestone, shale, and a sandstone member. Soils are Faywood, Blackthorn, Berks, and Dekalb. The McKenzie Formation consists of limestone. Faywood and Blackthorn soils are in this area. The Clinton Group and the Tuscarora Sandstone, combined with the Ordovician aged Juniata Formation, form the rugged landscape that is mainly on Michael, Brushy, and Beaver Lick Mountains. The Clinton Group is comprised of shale, sandstone, and what has been called “iron stone.” The Tuscarora is a white quartzitic sandstone that carries a siliceous cement, which makes it the most weather resistant rock in the county (Price 1929). The Juniata Formation, which is comprised of red shale and sandstone, is the oldest deposit exposed in the county. It outcrops in a few small areas. Calvin, Dekalb, and Berks soils are on this rugged landscape.

The last area includes everything east of the

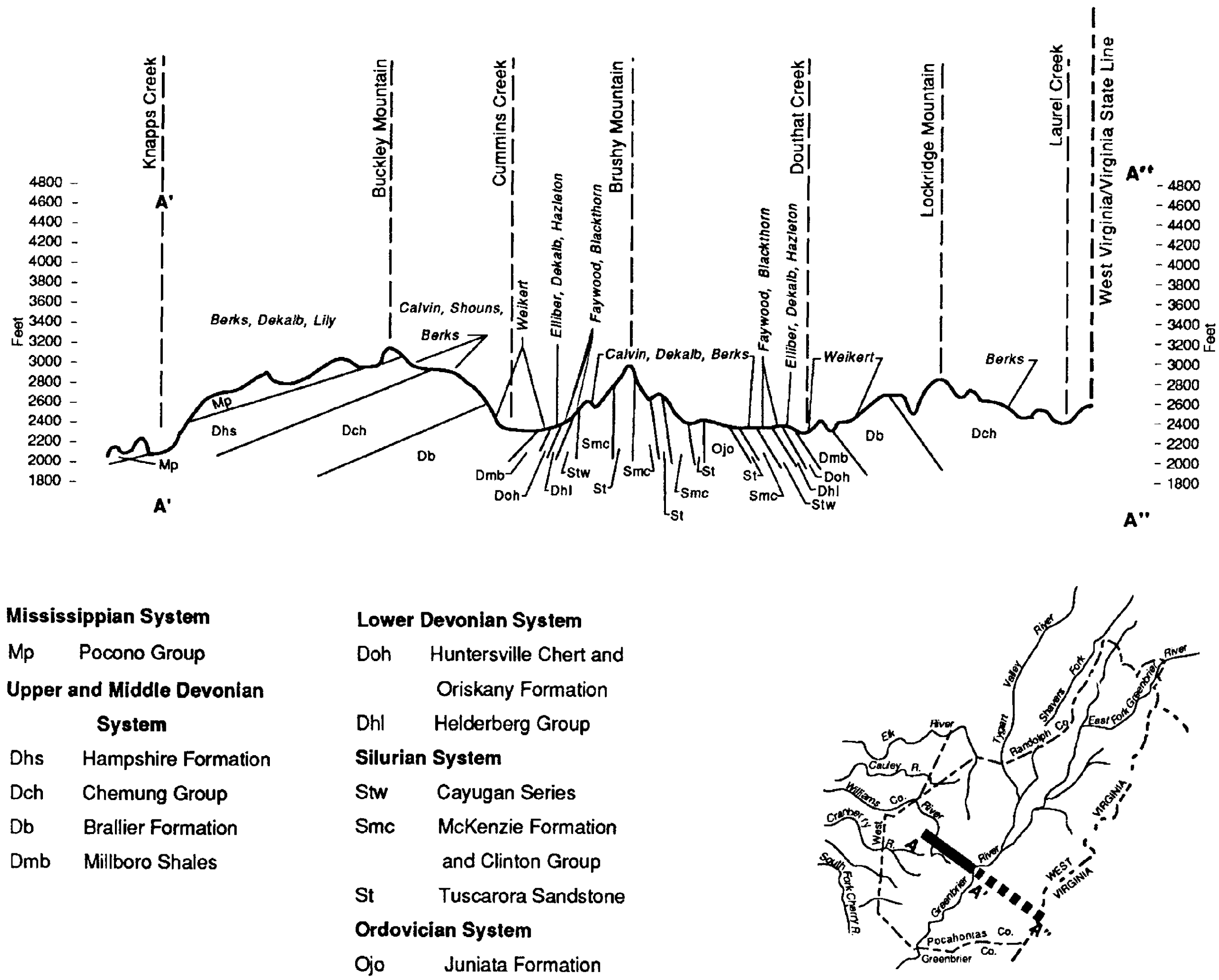


Figure 3.—Schematic cross section of the major geologic strata and dominant soils in Pocahontas County (A´-A´´).

Greenbrier River except for the area that extends from Green Bank southwestward into Greenbrier County. The material here is of upper and middle Devonian age. It is comprised of the Hampshire Formation, the Chemung Group, the Brallier Formation, and the Millboro Shales.

The Hampshire Formation is made up of shale, siltstone, and sandstone. In the central part of the county, in the vicinity of Cass, the formation is dominated by red layers, but as the formation extends to the northeast and southwest from this area, yellowish brown layers dominate. Calvin, Berks, Dekalb, Shouns, and Macove soils are on this formation. Mandy, Snowdog, and Trussel soils are in the northeastern section of the county where this formation occurs.

The Chemung Group is the largest expanse of geologic material exposed in the county. It consists of yellowish brown interbedded sandstone and shale. The sandstone ranges from lenses to massive ledges. Berks, Weikert, and Macove soils are on this formation. Mandy, Snowdog, and Trussel soils are at the higher elevations in the northeastern section of the county where the Chemung Group outcrops.

The Brallier Formation is comprised mainly of gray shale, but it includes some siltstone and fine grained sandstone. This formation weathers to form low, rounded hills that parallel the major drains. Weikert soils are on the residual portions of this geologic formation, and Macove and Allegheny soils are on foot slopes and stream terraces, respectively.

The Millboro Shales are comprised of black and greenish gray fissile shales, some of which are the most erodible rocks in the county. These areas are frequently covered by alluvial soils, such as Orrville, Lobdell, Tioga, and Potomac soils, and terrace soils, such as Allegheny and Chavies soils. They are in the main valleys east of the Greenbrier River, along creeks such as Knapps Creek, North Fork of Anthony Creek, Browns Creek, and Deer Creek. Weikert soils are in the residual areas, which are usually low and rolling hills. Many of these areas are also covered with colluvial material, originating in the lower Devonian, Silurian, and Ordovician Systems. Mertz soils are in these areas. This is especially evident in the areas east of Beaver Creek and Cummings Creek Roads and east of West Virginia Route 28, between Dilley's Mill and Dunmore.

The relationship between soils, geology, and topography (Price 1929; West Virginia Geological and Economic Survey 1968) in Pocahontas County is shown in cross sections A-A´ and A´-A´´ (figs. 2 and 3).

How This Survey Was Made

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

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

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

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

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

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

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

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey 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 or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map 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 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.

Dominantly Mesic Soils Formed in Alluvium Derived From Sandstone, Siltstone, Shale, Limestone, or Chert

1. Potomac-Tioga-Holly

Nearly level, very deep, somewhat excessively drained, well drained, and poorly drained loamy soils formed in alluvium derived from sandstone, siltstone, shale, limestone, or chert uplands; on flood plains

The landscape is characterized by broad, nearly level flood plains that parallel streams in the survey area. Some areas are cut by stream channels that flow only during periods of high water. Cobbles occur mainly along streams and old stream channels. The better drained soils are mainly parallel and adjacent to the streams; the wetter soils are mainly farther from the streams. The native vegetation is dominantly hardwoods with some conifers.

This map unit makes up about 3 percent of the survey area. It is about 28 percent Potomac soils, 14 percent Tioga soils, 13 percent Holly soils, and 45 percent soils of minor extent.

The Potomac soils are somewhat excessively drained and nearly level. They are on flood plains and are subject to frequent flooding. They formed in alluvial material washed from acid and limy soils on uplands. They have a dark brown, medium textured surface layer and a brown, coarse textured substratum.

The Tioga soils are well drained and nearly level. They are on flood plains and are subject to occasional flooding. They formed in alluvial material washed from acid and limy soils on uplands. They have a dark yellowish brown, medium textured surface layer and a brown, medium textured subsoil.

The Holly soils are poorly drained and nearly level. They are on flood plains and are subject to frequent flooding. They formed in alluvial material washed from acid and limy soils on uplands. They have a very dark gray, medium textured surface layer and a dark gray, grayish brown, and light brownish gray, medium textured subsoil.

The minor soils in this map unit are the well drained Sensabaugh, moderately well drained Lobdell, and somewhat poorly drained Orrville soils on flood plains and the well drained Allegheny and Chavies soils on terraces.

About 95 percent of this unit is cleared and used intensively for row crops, hay, or pasture. The wooded areas are generally small in size and parallel the streams. The main limitation of these soils for most uses is the flooding.

2. Allegheny-Atkins

Nearly level to strongly sloping, very deep, well drained and poorly drained loamy soils formed in alluvium of varying age derived from sandstone, siltstone, and shale uplands; on terraces, foot slopes, alluvial fans, and flood plains

The landscape is characterized by broad terraces that “stairstep” down to narrow flood plains. Some areas are cut by stream channels that flow only during periods of high water. The native vegetation is dominantly hardwoods with some conifers.

This map unit makes up about 2 percent of the survey area. It is about 40 percent Allegheny soils, 15 percent Atkins soils, and 45 percent soils of minor extent.

The Allegheny soils are well drained and are gently sloping or strongly sloping. They are on terraces, foot slopes, and alluvial fans. They formed in old alluvial material washed from acid soils on uplands. They have a dark brown, medium textured surface layer and a dark yellowish brown, strong brown, and dark brown, medium textured subsoil.

The Atkins soils are poorly drained and nearly level. They are on flood plains and are subject to frequent flooding. They formed in alluvial material washed from acid soils on uplands. They have a dark yellowish brown, medium textured surface layer and an olive gray and light olive gray, medium textured subsoil.

The minor soils in this map unit are the somewhat excessively drained Potomac, moderately well drained Philo and Lobdell, and somewhat poorly drained Orrville soils on flood plains and the well drained Chavies and poorly drained Purdy soils on terraces.

About 90 percent of this unit is cleared and used intensively for row crops, hay, or pasture or for homesite or community development. Housing and community development can be conveniently located in areas of the unit that are not subject to flooding. The wooded areas are generally on the steeper slopes between the gently sloping terraces and the flood plains. The main limitation of these soils for most uses is the flooding.

Dominantly Mesic Soils Formed in Material Derived From Level-Bedded Sandstone, Siltstone, Shale, Limestone, or Chert

3. Duffield-Lodi-Belmont

Gently sloping to very steep, deep and very deep, well drained clayey and loamy soils formed in limestone and some sandstone, siltstone, shale, and chert; on uplands

The landscape is characterized by its relatively vast expanse of rolling farmland. The map unit is mainly a broad rolling plateau with scattered sinkholes. All of the surface drains in the unit become subsurface drains before leaving the unit. Rock outcrops and stones are on some of the steeper side slopes. The native vegetation is dominantly hardwoods.

This map unit makes up about 1 percent of the survey area. It is about 30 percent Duffield soils, 29 percent Lodi soils, 19 percent Belmont soils, and 22 percent soils of minor extent.

The Duffield soils are deep and well drained. These gently sloping and strongly sloping soils are on rolling hills. They formed in material weathered mainly from limestone that includes layers of siltstone and chert. They have a brown, medium textured surface layer and a yellowish brown and strong brown, fine textured subsoil.

The Lodi soils are very deep and well drained. These gently sloping and strongly sloping soils are on rolling hills. They formed in material weathered from limestone. They have a dark brown, medium textured surface layer and a reddish brown and yellowish red, fine textured subsoil.

The Belmont soils are deep and well drained. These gently sloping to very steep soils are on benches and side slopes. They formed in material weathered mainly from limestone with some interbedding of sandstone, siltstone, and shale. They have a very dark grayish brown, medium textured surface layer and a dark yellowish brown and dark brown, medium textured subsoil.

The minor soils in this map unit are the well drained Shouns soils on foot slopes and the moderately well drained Sees soils in upland depressions.

About 95 percent of this unit is cleared and used for general livestock farming with the production of winter forage and cash crops. The unit is also used for homesite or community development. The wooded areas are small, scattered farm woodlots. The main limitations of these soils for most uses are the slope, a shrink-swell potential, slow permeability, and the depth to bedrock.

4. Cateache-Shouns-Belmont

Gently sloping to extremely steep, moderately deep, very deep, and deep, well drained loamy soils formed in siltstone, limestone, shale, and some sandstone; on mountainous uplands and foot slopes

The landscape is characterized by broad, strongly sloping ridgetops; very steep side slopes broken by long, narrow, moderately steep benches; and gently sloping to steep foot slopes. Drainageways have cut into the side slopes forming very steep coves. Stones and boulders are common in this unit. Sandstone and limestone outcrops are in bands across some of the slopes. The native vegetation is dominantly northern hardwoods.

This map unit makes up about 24 percent of the survey area. It is about 54 percent Cateache soils, 23 percent Shouns soils, 19 percent Belmont soils, and 4 percent soils of minor extent.

The Cateache soils are moderately deep and well drained. These gently sloping to extremely steep soils are on ridgetops and side slopes. They formed in material weathered from dark reddish brown siltstone, shale, and fine grained sandstone. They have a very dark brown, medium textured surface layer and a dark reddish brown and reddish brown, medium textured subsoil.

The Shouns soils are very deep and well drained. The gently sloping to very steep soils are on foot slopes and benches and in coves. They formed in colluvial or alluvial material derived from sandstone, siltstone, shale, and limestone. They have a very dark grayish brown, medium textured surface layer and a brown, reddish brown, and dark reddish brown, medium textured subsoil.

The Belmont soils are deep and well drained. These gently sloping to very steep soils are on benches and side slopes. They formed in material weathered mainly from limestone with some interbedding of sandstone, siltstone, and shale. They have a very dark grayish brown, medium textured surface layer and a dark yellowish brown and dark brown, medium textured subsoil.

The minor soils in this map unit are the well drained Culleoka soils on uplands and the well drained Udorthents in areas that have been disturbed by road construction and urban development.

About 75 percent of this unit is wooded and used for timber production, recreational activities, or wildlife habitat. Sugar maple, American beech, black cherry, northern red oak, and a few red spruce are on the upper two-thirds of the landscape, and black locust, black walnut, and shagbark hickory are on the lower third of the landscape. Cleared areas of the unit generally follow the limestone geology. Most of the cleared areas are used for pasture with the less sloping areas being used for the production of winter feed. A few limestone quarries are in the unit. The main limitations of these soils for most uses are the slope, the stones on the surface, and downslope soil movement.

Dominantly Mesic Soils Formed in Material Derived From Folded Sandstone, Siltstone, Shale, Limestone, or Chert

5. Blackthorn-Faywood-Berks

Gently sloping to very steep, very deep and moderately deep, well drained loamy and clayey soils formed in siltstone, shale, limestone, and sandstone; on mountainous uplands and foot slopes

The landscape is characterized by rolling hills that grade to low, sharp ridges or very steep side slopes (fig. 4). Drainageways in this map unit generally sink below the surface because of the cavernous bedrock that underlies sections of the unit. Limestone outcrops are common on the steep side slopes, and stones are on the foot slopes. The native vegetation consists of hardwoods and some conifers.

This map unit makes up about 3 percent of the survey area. It is about 47 percent Blackthorn soils, 24 percent Faywood soils, 15 percent Berks soils, and 14 percent soils of minor extent.

The Blackthorn soils are very deep and well drained. These strongly sloping to very steep soils are on foot slopes, benches, and side slopes. They formed in colluvial material derived from sandstone and shale and in the underlying residuum of limestone and limy shales. They have a dark brown, medium textured surface layer. The upper part of the subsoil is yellowish brown and is medium textured, and the lower part of the subsoil is strong brown and is fine textured.

The Faywood soils are moderately deep and well drained. These strongly sloping to very steep soils are on upland flats and side slopes. They formed in material weathered from limestone with some interbedding of shale and siltstone. Rock outcrops are common on these soils. The soils have a brown, medium textured surface layer and a yellowish brown and strong brown, fine textured subsoil.

The Berks soils are moderately deep and well drained. These gently sloping to very steep soils are on ridgetops and side slopes. They formed in material weathered from interbedded siltstone, shale, and fine grained sandstone. They have a dark brown, medium textured surface layer and a yellowish brown, medium textured subsoil.

The minor soils in this map unit are the well drained Dekalb soils on ridgetops and side slopes.

About 45 percent of this map unit is wooded and used for timber production or as wildlife habitat. The dominant tree species are white, chestnut, and scarlet oaks; bitternut, mockernut, shagbark, and pignut hickories; and eastern white pine. Eastern redcedar is in areas of the Faywood soils. Cleared areas of the unit generally follow the limestone geology. The unit is used mainly as pasture or for hay production. Building livestock watering facilities is necessary because of the lack of surface water. The main limitations of these soils for most uses are the slope, the stones on the surface, the rock outcrops, and the depth to bedrock.

6. Calvin-Shouns

Gently sloping to extremely steep, moderately deep and very deep, well drained loamy soils formed in siltstone, shale, and sandstone; on mountainous uplands and foot slopes

The landscape is characterized by rugged mountainous topography. The mountains have been dissected and have strongly contrasting local relief. Very steep side slopes separate long, narrow, strongly

Figure 4.—Typical landscape in an area of the Blackthorn-Faywood-Berks general soil map unit, east of Dilley's Mill.

sloping ridgetops that lie parallel to the Greenbrier River. Stones and sandstone outcrops are common in this unit. The outcrops generally are on the eastern side of the mountains, directly below the ridgetops. The native vegetation is dominantly hardwoods with some conifers.

This map unit makes up about 5 percent of the survey area. It is about 76 percent Calvin soils, 19 percent Shouns soils, and 5 percent soils of minor extent.

The Calvin soils are moderately deep and well drained. These strongly sloping to extremely steep soils are on ridgetops and side slopes. They formed in material weathered from dark reddish brown siltstone, shale, and fine grained sandstone. They have a dark reddish brown, medium textured surface layer and a reddish brown, medium textured subsoil.

The Shouns soils are very deep and well drained. These gently sloping to very steep soils are on foot slopes and benches and in coves. They formed in colluvial or alluvial material derived from sandstone, siltstone, and shale. They have a very dark grayish brown, medium textured surface layer and a brown, reddish brown, and dark reddish brown, medium textured subsoil.

The minor soils in this map unit are the well drained Berks soils on uplands.

About 90 percent of this unit is wooded and used for timber production, recreational activities, or wildlife habitat. Oaks and hickories dominate the unit. Chestnut oak and hickories dominate ridgetops and the upper side slopes that have south aspects. White oak dominates the middle side slopes. Yellow-poplar, red maple, white ash, northern red oak, and eastern white pine are on north aspects and foot slopes. Cleared areas of the unit are used for pasture, production of winter feed, and community development. The main limitations of these soils for most uses are the slope, the depth to bedrock, and the stones on the surface.

7. Berks-Weikert

Gently sloping to extremely steep, moderately deep and shallow, well drained loamy soils formed in siltstone, shale, and sandstone; on mountainous uplands

The landscape is characterized by highly dissected topography. The mountains have sharp, strongly sloping ridgetops that separate very steep, smooth side slopes. Spur ridges from the mountain area descend to form lower hills having narrow ridges and very steep side slopes that generally plunge to broad flood plains. The native vegetation is dominantly hardwoods on the upper slopes and conifers on the lower slopes.

This map unit makes up about 30 percent of the survey area. It is about 52 percent Berks soils, 32 percent Weikert soils, and 16 percent soils of minor extent.

The Berks soils are moderately deep and well drained. These gently sloping to extremely steep soils are on ridgetops and side slopes in the more mountainous areas. They formed in material weathered from interbedded siltstone, shale, and fine grained sandstone. They have a dark brown, medium textured surface layer and a yellowish brown, medium textured subsoil.

The Weikert soils are shallow and well drained. These strongly sloping to extremely steep soils are on ridgetops and side slopes of the hills. They formed in material weathered from shale, siltstone, and fine grained sandstone. They have a dark brown, medium textured surface layer and a yellowish brown, medium textured subsoil.

The minor soils in this map unit are the well drained Dekalb and Lily and moderately well drained Blairton soils on uplands; the well drained Macove soils on foot slopes, benches, and alluvial fans; and the well drained Udorthents in areas that have been disturbed by road construction or community development.

The majority of this map unit is within Monongahela National Forest. About 85 percent of the unit is wooded and used for timber production, recreational activities, or wildlife habitat. The Berks soils produce a more valuable stand of timber, dominated by white oak, white ash, and eastern white pine. The Weikert soils produce a less desirable stand of timber, dominated by chestnut oak, white oak, hickories, pitch pine, and, on the lower slopes, eastern white pine. Cleared areas are used for pasture, and areas adjacent to large expanses of bottom land are being developed for homesites. The main limitations of these soils for most uses are the slope and the depth to bedrock.

8. Dekalb-Calvin-Mertz-Elliber

Gently sloping to very steep, moderately deep and very deep, well drained loamy soils formed in sandstone, siltstone, shale, and chert; on mountainous uplands, benches, and foot slopes

The landscape is characterized by rugged mountainous topography. A very narrow, high ridge is the center of this map unit. Very steep side slopes are met at a lower elevation by knobs that are along both the western and eastern sides of the high ridge. Stones are in most areas of the unit. Sandstone outcrops are along the ridgetops and on the northern and southern side slopes of the knobs. The native vegetation consists mainly of hardwoods and some conifers. The understory is a very dense growth of mountain laurel and huckleberry.

This map unit makes up about 4 percent of the survey area. It is about 25 percent Dekalb soils, 18 percent Calvin soils, 14 percent Mertz soils, 14 percent Elliber soils, and 29 percent soils on minor extent.

The Dekalb soils are moderately deep and well drained. These strongly sloping to very steep soils are on ridgetops and side slopes. They formed in material weathered mainly from sandstone. They have a very dark grayish brown, medium textured surface layer and a yellowish brown, medium textured subsoil.

The Calvin soils are moderately deep and well drained. These strongly sloping to very steep soils are on ridgetops and side slopes. They formed in material weathered from dark reddish brown siltstone, shale, and fine grained sandstone. They have a dark reddish brown, medium textured surface layer and a reddish brown, medium textured subsoil.

The Mertz soils are very deep and well drained. These gently sloping to steep soils are on foot slopes and benches. They formed in cherty colluvium that contains varying amounts of sandstone, siltstone, and shale. They have a very dark grayish brown, medium textured surface layer and a dark yellowish brown and yellowish brown, medium textured subsoil.

The Elliber soils are very deep and well drained. These very steep soils are on side slopes. They formed in material weathered from chert with some interbedding of sandstone and shale. They have a very dark grayish brown, medium textured surface layer and a yellowish brown, medium textured subsoil.

The minor soils in this map unit are the well drained

Berks and Hazleton soils on ridgetops and side slopes.

About 95 percent of this unit is wooded and used for timber production, recreational activities, or wildlife habitat. Oaks and hickories dominate the unit. Chestnut oak and hickories dominate ridgetops and the upper side slopes that have south aspects. White oak dominates the middle side slopes. Yellow-poplar, red maple, white ash, northern red oak, and eastern white pine are on north aspects and foot slopes. Cleared areas of the unit are used for pasture. Several chert quarries and a few small sand pits are in areas of the unit. The main limitations of these soils for most uses are the slope, the stones on the surface, and the depth to bedrock.

Dominantly Frigid Soils Formed in Material Derived From Level-Bedded Sandstone, Siltstone, and Shale

9. Mandy-Snowdog-Gauley

Strongly sloping to extremely steep, moderately deep and very deep, well drained and moderately well drained loamy soils formed in sandstone, siltstone, and shale; on mountainous uplands and foot slopes

The landscape is characterized by rough, rugged mountainous topography. It is a greatly dissected, high plateau that has broad, gently sloping ridgetops and knobs and very steep side slopes. It generally is at elevations of more than 4,000 feet. Several major streams have their sources in this map unit. Sandstone outcrops and stones and boulders on the surface are common. The native vegetation is dominantly red spruce, red maple, yellow birch, and American beech. Also “heath barrens” that are dominated by mountain laurel, huckleberry, blueberry, and great rhododendron are in scattered areas of the unit.

This map unit makes up about 16 percent of the survey area. It is about 59 percent Mandy soils, 19 percent Snowdog soils, 11 percent Gauley soils, and 11 percent soils of minor extent.

The Mandy soils are moderately deep and well drained. These strongly sloping to extremely steep soils are on ridgetops and the upper side slopes. They formed in material weathered from interbedded siltstone, shale, and fine grained sandstone. They have a very dark brown, medium textured surface layer and a dark yellowish brown and yellowish brown, medium textured subsoil.

The Snowdog soils are very deep and moderately well drained. These steep soils are on the lower side slopes, foot slopes, and benches. They formed in colluvium derived from shale, siltstone, and sandstone. They have a very dark brown, medium textured surface layer and a dark brown and yellowish brown, medium textured subsoil that is very firm and brittle in the lower part.

The Gauley soils are moderately deep and well drained. These strongly sloping to steep soils are on broad ridgetops under dense stands of red spruce. They formed in material weathered from sandstone. They have a black, coarse textured surface layer and a dark reddish brown and strong brown, medium textured subsoil.

The minor soils in this map unit are the well drained Briery soils and Udorthents in disturbed areas, the somewhat poorly drained Leatherbark soils on broad ridgetops, the very poorly drained Medihemists in depressions on broad flats, the poorly drained Trussel soils on foot slopes and benches, and the well drained to poorly drained Udifluvents and Fluvaquents on flood plains.

The majority of this map unit is within Monongahela National Forest. About 95 percent of the unit is wooded and used for timber production, recreational activities, or wildlife habitat. Red spruce is the dominant species on the ridgetops, knobs, and the upper sides slopes that have west aspects. It is used by rustic fence industries in Pocahontas County and the surrounding area. Hardwoods are in the more protected areas of the unit. Cleared areas are used for ski resorts, scenic overlooks, and the production of hay. The main limitations of these soils for most uses are the slope, the stones on the surface, the depth to bedrock, and a seasonal high water table.

10. Mandy

Gently sloping to extremely steep, moderately deep, well drained loamy soils formed in interbedded siltstone, shale, and sandstone; on mountainous uplands

The landscape is characterized by mountainous topography. It is a greatly dissected high plateau that has gently sloping ridgetops and knobs and very steep side slopes. The map unit generally is at elevations of more than 3,000 feet. The Greenbrier River has its source in the unit. The native vegetation is northern hardwoods.

This map unit makes up about 12 percent of the survey area. It is about 93 percent Mandy soils and 7 percent soils of minor extent.

The Mandy soils are moderately deep and well drained. These strongly sloping to extremely steep soils are on ridgetops and the upper side slopes. They formed in material weathered from interbedded siltstone, shale, and fine grained sandstone. They have a very dark brown, medium textured surface layer and a dark yellowish brown and yellowish brown, medium textured subsoil.

The minor soils in this map unit are the moderately well drained Snowdog soils on the lower side slopes, foot slopes, and benches; the poorly drained Trussel soils on foot slopes and benches; and the well drained to poorly drained Udifluvents and Fluvaquents on flood plains.

The majority of this map unit is within Monongahela National Forest. About 90 percent of the unit is wooded and used for timber production, recreational activities, or wildlife habitat. The dominant timber species is American beech. Other species in the unit are sugar maple, red maple, yellow birch, and black cherry. Several plantations of red pine, Norway spruce, and red spruce are in the unit. The main limitations of these soils for most uses are the slope, the stones on the surface, and the depth to bedrock.

Detailed Soil Map Units

Dr. John Sencindiver, professor of agronomy, West Virginia Agricultural and Forestry Experiment Station, helped to prepare this section. Robert J. Hunsucker, naturalist, assisted in the preparation of the paragraph describing the dominant forest plant communities in each of the map units. The common plant names given in the paragraph and the corresponding scientific names can be found in the publication “Flora of West Virginia” (Strausbaugh and Core n.d.).

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

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

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Berks channery silt loam, 35 to 55 percent slopes, very stony, is a phase of the Berks series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Berks-Dekalb complex, 35 to 55 percent slopes, very stony, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Berks, Weikert, and Calvin soils, 55 to 80 percent slopes, very stony, is an undifferentiated group in this survey area.

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

Soil Descriptions

AlB—Allegheny loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and well drained. It is typically on stream terraces, foot slopes, and alluvial fans along the major rivers of the county.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil is about 32 inches thick. The upper 13 inches is dark yellowish brown loam, the next 9 inches is dark yellowish brown gravelly silt loam, the next 4 inches is strong brown gravelly loam, and the lower 6 inches is dark brown very gravelly fine sandy loam. The substratum to a depth of 60 inches or more is strong brown extremely gravelly fine sandy loam.

Included with this soil in mapping are small areas of the well drained Macove soils and the poorly drained Purdy soils. Also included are areas of soils that are moderately well drained, areas of soils that have a gravelly surface layer, and areas of soils that have slopes of less than 3 percent or more than 8 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate to high in the Allegheny soil. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. Depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are used for urban development, especially in the area of Green Bank.

This soil is suited to cultivated crops, hay, and pasture. It is used mainly for cultivated crops or hay. The hazard of erosion is moderate in unprotected areas. It is a management concern. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are management needs in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, eastern white pine, and white oak. The dominant plant communities in the understory are red maple, white oak, mountain laurel, witch hazel, hawthorn, and eastern white pine, and those in the ground cover are ferns, ground pine, teaberry, asters, violets, cinquefoil, and grasses.

Small stones and the slope are the main limitations on sites for playgrounds. The other recreational development activities are not limited by these features.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

Few restrictive features affect urban development in areas of this soil. Maintaining a plant cover on construction sites, establishing a plant cover in unprotected areas, and properly disposing of surface water help to control erosion and sedimentation.

The capability subclass is IIe. The woodland ordination symbol is 4A.

AlC—Allegheny loam, 8 to 15 percent slopes

This soil is very deep, strongly sloping, and well drained. It is typically on stream terraces, foot slopes, and alluvial fans along the major rivers of the county.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil is about 32 inches thick. The upper 13 inches is dark yellowish brown loam, the next 9 inches is dark yellowish brown gravelly silt loam, the next 4 inches is strong brown gravelly loam, and the lower 6 inches is dark brown very gravelly fine sandy loam. The substratum to a depth of 60 inches or more is strong brown extremely gravelly fine sandy loam.

Included with this soil in mapping are small areas of the well drained Macove and Weikert soils and the poorly drained Purdy soils. Also included are areas of soils that are moderately well drained, areas of soils that have a gravelly surface layer, and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Allegheny soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. Depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are used for urban development, especially in the area of Green Bank.

This soil is suited to cultivated crops, hay, and pasture. It is used mainly for cultivated crops or hay. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are management needs in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, eastern white pine, and white oak. The dominant plant communities in the understory are red maple, white oak, mountain laurel, witch hazel, hawthorn, and eastern white pine, and those in the ground cover are ferns, ground pine, teaberry, asters, violets, cinquefoil, and grasses.

The slope is the main limitation affecting recreational development in areas of this soil. Excavating the soil in areas used for camping or picnicking or as playgrounds, establishing paths and trails on a gentle grade across the slope, and installing devices to help control surface water reduce the hazard of erosion.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The slope is the main limitation affecting most urban uses. The effects of the slope can be minimized by designing dwellings so that they conform to the natural slope of the land and to the setting; land shaping or installing distribution lines for septic tank absorption fields across the slope; and constructing roads and streets on a gentle grade across the slope. Maintaining a plant cover on construction sites, establishing a plant cover in unprotected areas, and properly disposing of surface water help to control erosion and sedimentation.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

At—Atkins silt loam

This soil is very deep, nearly level, and poorly drained. It is typically on flood plains of the Deer Creek watershed in the northeastern part of the county and is subject to frequent flooding. Slope ranges from 0 to 3 percent.

Typically, the surface layer is dark yellowish brown silt loam about 4 inches thick. The subsoil is about 21 inches thick. The upper 7 inches is olive gray silt loam that has dark yellowish brown and yellowish brown mottles. The lower 14 inches is light olive gray silt loam that has light brownish gray and yellowish brown mottles. The substratum extends to a depth of 60 inches or more. The upper 8 inches is gray silt loam that has light yellowish brown, dark yellowish brown, and yellowish brown mottles. The lower part is gray very gravelly silt loam that has yellowish brown mottles. In some areas the subsoil has olive mottles. In other areas the solum is thinner.

Included with this soil in mapping are small areas of the moderately well drained Philo soils and the well drained Macove soils. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Atkins soil. Permeability is slow to moderate in the subsoil. Runoff is slow, and natural fertility is medium. In unlimed areas reaction is very strongly acid or strongly acid. The seasonal high water table is within a depth of 1 foot. It restricts the root zone of many types of plants. Depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees. Most of the acreage is pasture or idle land.

This soil is suited to cultivated crops but is better suited to hay or pasture plants that tolerate wetness. The hazard of erosion is slight. The wetness restricts the use of most types of farm machinery. If the soil is cultivated, minimizing tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Proper stocking rates, a rotation grazing system, and deferment of grazing until the soil is firm are the major management needs in pastured areas.

The potential productivity for trees that tolerate wetness is moderately high on this soil, but only a small acreage is wooded. The wetness and the flooding are the major management concerns. Logging should be deferred during wet periods until the soil is reasonably firm. Using conventional skidder/tractor logging equipment is not recommended. Haul roads and landings should be built in adjacent areas of well drained soils. Constructing haul roads is difficult because this soil often is intersected by intermittent stream channels. If haul roads are built in areas of the soil, some gravel surfacing may be needed. Skidding equipment should not be operated on this soil. Intermittent stream channels should not be crossed unless proper crossings have been developed. Planting filter strips along streams and seeding bare areas are recommended. Plant competition also is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are pin oak, American sycamore, river birch, red maple, and eastern white pine. The dominant plant communities in the understory are brookside alder, black willow, ninebark, Glade St. John's-wort, winterberry, and swamp rose, and those in the ground cover are grasses, sedges, reeds, mosses, false hellebore, and skunk cabbage.

The flooding and the wetness are limitations affecting recreational development in areas of this soil. Areas of the included Macove soils have fewer restrictive features affecting recreational development.

This soil has fair potential for woodland, openland, and wetland wildlife habitat. It can provide habitat for small populations of wetland wildlife species, such as red-winged blackbirds, amphibians, and insects.

The flooding and the wetness are the main limitations affecting most urban uses. The potential for frost action is an additional limitation on sites for local roads and streets, and the slow permeability is an additional limitation on sites for septic tank absorption fields. Areas of the included Macove soils have fewer restrictive features affecting most urban uses.

The capability subclass is IIIw. The woodland ordination symbol is 4W.

BaB—Belmont silt loam, 3 to 8 percent slopes

This soil is deep, gently sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils on ridgetops and the very deep Shouns soils on benches. Also included are areas of soils that contain more clay in the subsoil, areas of soils that have slopes of more than 8 percent, and areas of exposed bedrock. Inclusions make up about 15 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum. Depth to bedrock ranges from 40 to 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of underground channels. Developing springs and building ponds help to overcome this limitation in some areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistles.

The slope and small stones are the main limitations on sites for playgrounds. The effects of these limitations can be minimized by land shaping to create level areas and by removing the stones. The other recreational development activities are not limited by these features.

This soil has good potential for openland and woodland wildlife habitat. Some areas support a moderate population of large game species, such as white-tailed deer and wild turkey, as well as small game species, such as mourning dove and ruffed grouse.

The depth to bedrock and the shrink-swell potential are the main limitations affecting urban uses. Areas of the included Shouns soils have fewer restrictive features affecting most urban uses.

The depth to bedrock and the shrink-swell potential are the main limitations on sites for dwellings with basements. The shrink-swell potential is the main limitation on sites for dwellings without basements. Building above the bedrock and adding fill material when landscaping minimize the effects of the restrictions caused by the depth to bedrock. Adding extra reinforcement to footings and backfilling with sandy material minimize the damage caused by shrinking and swelling.

The depth to bedrock is a limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

Erosion is a management concern in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 4A.

BaC—Belmont silt loam, 8 to 15 percent slopes

This soil is deep, strongly sloping, and well drained. It is typically on benches and ridgetops west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils on side slopes and the very deep Shouns soils on benches. Also included are areas of soils that contain more clay in the subsoil, areas of soils that have slopes of less than 8 percent or more than 15 percent, and areas of exposed bedrock. Inclusions make up about 15 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum. Depth to bedrock ranges from 40 to 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of underground channels. Developing springs and building ponds help to overcome this limitation in some areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistles.

The slope is the main limitation affecting most recreational development in areas of this soil. Selecting areas of the included soils that are less sloping for use as sites or land shaping to create less sloping areas minimizes the effects of the slope.

This soil has good potential for openland and woodland wildlife habitat. Some areas support a moderate population of large game species, such as white-tailed deer and wild turkey, as well as small game species, such as mourning dove and ruffed grouse.

The depth to bedrock, the slope, and the shrink-swell potential are the main limitations affecting most urban uses. Areas of the included Shouns soils and areas of included soils that are less sloping have fewer restrictive features affecting most urban uses.

The depth to bedrock, the shrink-swell potential, and the slope are the main limitations on sites for dwellings with basements. The shrink-swell potential and the slope are the main limitations on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. Adding extra reinforcement to footings and backfilling with sandy material minimize the damage caused by shrinking and swelling.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Land shaping, installing distribution lines across the slope, or installing an alternate system minimizes the effects of the restrictions caused by the slope and the depth to bedrock.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

BaD—Belmont silt loam, 15 to 25 percent slopes

This soil is deep, moderately steep, and well drained. It is typically on benches and side slopes west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils on side slopes and the very deep Shouns soils on foot slopes. Also included are areas of soils that contain more clay in the subsoil, areas of soils that have slopes of less than 15 percent or more than 25 percent, and some areas of exposed bedrock. Inclusions make up about 15 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum.

Most areas of this soil have been cleared of trees and are used as pasture. A few are wooded.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Erosion and overgrazing are the major management concerns in pastured areas. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistle.

The major limitation affecting recreational development is the slope. Laying out hiking trails on a gentle grade across the slope helps to overcome the slope and control surface runoff. Land shaping to create areas that are less sloping minimizes the effects of the slope in areas used for other recreational activities.

This soil has fair potential for openland wildlife habitat and good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as gray squirrel and ruffed grouse.

The slope is the main limitation affecting most urban uses. Low strength is an additional limitation on sites for local roads and streets. Areas of the included Shouns soils have fewer restrictions for most urban uses.

The capability subclass is IVe. The woodland ordination symbol is 4R on north and south aspects.

BbC—Belmont silt loam, 3 to 15 percent slopes, very rocky

This soil is deep, strongly sloping and gently sloping, and well drained. It is typically on benches west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River. About 2 to 10 percent of the surface is exposed bedrock. Sinkholes are common in some areas.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils and the very deep Shouns soils. Also included are areas of soils that are less than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, and areas of soils that have slopes of more than 15 percent. Inclusions make up about 20 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is medium or rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum. Depth to bedrock ranges from 40 to 60 inches.

Most areas of this soil have been cleared of trees and are used as pasture. A few small areas are used for hay or are wooded.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. Rock outcrop restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and the equipment limitation are the major management concerns. The rock outcrop limits the use of equipment. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistles.

The major limitation affecting recreational development is the slope. Land shaping and grading and designing the facilities so that they conform to the natural slope of the land minimize the effects of this limitation.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as mourning dove and ruffed grouse.

The depth to bedrock, the slope, and the shrink-swell potential are the main limitations affecting most urban uses. Areas of the included Shouns soils and areas where there is less rock outcrop have fewer restrictive features affecting most urban uses.

The depth to bedrock, the shrink-swell potential, and the slope are the main limitations on sites for dwellings with basements. The shrink-swell potential and the slope are the main limitations on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. Adding extra reinforcement to footings and backfilling with sandy material minimize the damage caused by shrinking and swelling.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Land shaping, installing distribution lines across the slope, or installing an alternate system minimizes the effects of the restrictions caused by the slope and the depth to bedrock.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is VIs. The woodland ordination symbol is 4A.

BbE—Belmont silt loam, 15 to 35 percent slopes, very rocky

This soil is deep, steep and moderately steep, and well drained. It is typically on benches and side slopes west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River. About 2 to 10 percent of the surface is exposed bedrock. Sinkholes are common in some areas.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils on side slopes and the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, and areas of soils that have slopes of less than 15 percent or more than 35 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is rapid or very rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum. The depth to bedrock ranges from 40 to 60 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the rocks restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas. The rock outcrop and the slope restrict the use of farm machinery.

The potential productivity for trees is moderately high on north and south aspects of this soil. Erosion on roads, skid trails, and landings, plant competition, and the equipment limitation are the major management concerns. The slope and the rock outcrop limit the use of equipment. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, white oak, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are white oak, hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistles.

The slope is the main limitation affecting recreational development. Laying out hiking trails on a gentle grade across the slope helps to overcome the slope and control surface runoff. Land shaping and grading or designing the facilities so that they conform to the natural slope of the land minimizes the effects of the slope in areas used for other recreational activities.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed dear, and wild turkey, as well as some small game species, such as gray squirrel and ruffed grouse.

The slope, the depth to bedrock, and the shrink-swell potential are the main limitations affecting most urban uses. Areas of the included Shouns soils and areas of included soils where slopes are 8 to 15 percent and there is less rock outcrop have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north and south aspects.

BbF—Belmont silt loam, 35 to 55 percent slopes, very rocky

This soil is deep, very steep, and well drained. It is typically on side slopes west of the Greenbrier River. It is also in an area near the head of the East Fork of the Greenbrier River. About 2 to 10 percent of the surface is exposed bedrock.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 32 inches thick. The upper 3 inches is dark yellowish brown silt loam, the next 6 inches is dark brown channery silt loam, the next 11 inches is dark brown channery silty clay loam, and the lower 12 inches is dark brown channery silty clay. The substratum is dark brown very channery silty clay. Gray limestone bedrock is interbedded with dark grayish brown siltstone bedrock at a depth of about 51 inches.

Included with this soil in mapping are a few small areas of the moderately deep Culleoka and Cateache soils on side slopes and the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, and areas of soils that have slopes of less than 35 percent or more than 55 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is high in the Belmont soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to slightly alkaline in the substratum. The depth to bedrock ranges from 40 to 60 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the rocks restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. Erosion on roads, skid trails, and landings, plant competition, and the equipment limitation are the major management concerns. The slope and the rock outcrop limit the use of equipment. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. When timber is harvested, the slope restricts the use of wheeled and tracked equipment in skidding operations. Cable yarding systems generally are safer and disturb the soil less. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a major concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding and mulching bare areas, and keeping the total mileage of roads and trails to a minimum also help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, white oak, American beech, sugar maple, and black walnut. The dominant plant communities in the understory are white oak, hickory, American beech, black locust, sassafras, dogwood, and multiflora rose, and those in the ground cover are grasses, mosses, ferns, and thistles.

The slope is the main limitation affecting recreational development. Laying out hiking trails on a gentle grade across the slope minimizes the effects of the slope and helps to control surface runoff.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as gray squirrel and ruffed grouse.

The slope, the depth to bedrock, and the shrink-swell potential are the main limitations affecting most urban uses. Less sloping areas of the included Shouns soils would be better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north and south aspects.

BeB—Berks channery silt loam, 3 to 8 percent slopes

This soil is moderately deep, gently sloping, and well drained. It is typically in the eastern half of the county on convex ridgetops and broad benches.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is brown channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are many small areas of the shallow Weikert soils and a few small areas of the moderately deep Dekalb soils. Also included are areas of soils that have fewer rock fragments in the profile than the Berks soil, areas of soils that are moderately well drained, and areas of soils that have slopes of more than 8 percent. Included soils make up about 25 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is medium, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for cultivated crops or hay. Some are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas.

The potential productivity for trees is moderate on this soil. Erosion is a management concern when timber is harvested. Roads should not be used during wet periods. If roads must be used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, and seeding bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

Stoniness is the main limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds. Removing the small stones minimizes this restrictive feature. Standard septic tank absorption fields may not function properly. An alternate system or a self-contained system, such as sealed vault toilets, possibly could be installed. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Seeding bare areas following construction reduces the hazard of erosion.

This soil has poor potential for woodland wildlife habitat and fair potential for openland wildlife habitat. Most areas support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse, which feed on the grasses or insects in these areas.

The depth to bedrock is the main limitation affecting most urban uses. The effects of the depth to bedrock can be minimized on sites for dwellings with basements by building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land. The rock, which is soft in most places, can be excavated with conventional earth moving equipment.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The capability subclass is IIe. The woodland ordination symbol is 3A.

BeC—Berks channery silt loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is typically in the eastern half of the county on convex ridgetops and broad benches.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are small areas of the shallow Weikert soils and the moderately deep Dekalb soils. Also included are areas of soils that have fewer rock fragments in the profile than the Berks soil, areas of soils that are moderately well drained, and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 15 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas.

The potential productivity for trees is moderate on this soil. Erosion on roads, skid trails, and log landings is a major management concern. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

The slope and small stones are the main limitations affecting most recreational development in areas of this soil. Selecting areas of the included soils that are less sloping and have fewer rock fragments on the surface minimizes the effects of these limitations. Land shaping and designing facilities so that they conform to the natural slope of the land minimize the effects of the slope.

This soil has fair potential for openland wildlife habitat and poor potential for woodland wildlife habitat. The woodland wildlife also feed in the cleared areas. The unit supports an abundant population of small and large game species, especially in the area of Back Mountain Road north of Clover Lick.

The depth to bedrock and the slope are the main limitations affecting urban uses. Areas of included soils that are deeper to bedrock and less sloping are better suited to urban development.

The slope is the main limitation on sites for dwellings without basements. The slope and the depth to bedrock are the main limitations on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The slope is the main limitation on sites for local roads and streets. Constructing roads and streets on a gentle grade across the slope minimizes this restrictive feature.

The capability subclass is IIIe. The woodland ordination symbol is 3A.

BeD—Berks channery silt loam, 15 to 25 percent slopes

This soil is moderately deep, moderately steep, and well drained. It is typically in the eastern half of the county on convex ridgetops, broad benches, and side slopes.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are many small areas of the shallow Weikert soils and a few small areas of the moderately deep Dekalb soils. Also included are areas of soils that have fewer rock fragments in the profile than the Berks soil, areas of soils that are moderately well drained, and areas of soils that have slopes of less than 15 percent or more than 25 percent. Included soils make up about 25 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of this soil. Erosion is a management concern when timber is harvested. The limitations for operability of logging equipment and the construction of haul roads and skid roads are moderate. The limitations for construction of landings are severe. The most important limiting factor is the slope, which is minimized when soil is excavated during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of included soils. Roads should not be used during wet periods. If roads must be used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

The slope and small stones are the main limitations affecting most recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing the facilities so that they conform to the natural slope of the land. The stones should be removed. Standard septic tank absorption fields may not function properly. An alternate system or a self-contained system, such as sealed vault toilets, possibly could be installed in the less sloping areas of the map unit. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Seeding bare areas following construction reduces the hazard of erosion. The soil has moderate limitations on sites for hiking trails. The slope is the main restrictive feature. Trails should be established on a gentle grade across the slope. Water bars help to control surface runoff and erosion.

This soil has poor potential for woodland wildlife habitat. Many areas, however, support abundant populations of small and large game species, especially in the Boyer area, the Back Mountain Road area north of Cloverlick, and near Watoga State Park. These populations rely heavily on adjacent, more suitable habitat areas for food and water. The potential of the soil for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings with grasses and legumes beneficial to wildlife; and creating openings in the overstory.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Areas of included soils that are less sloping and deeper to bedrock are better suited to urban development.

The capability subclass is IVe. The woodland ordination symbol is 3R on north and south aspects.

BeE—Berks channery silt loam, 25 to 35 percent slopes

This soil is moderately deep, steep, and well drained. It is typically in the eastern half of the county on side slopes.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are many small areas of the shallow Weikert soils and a few small areas of the moderately deep Dekalb soils. Also included are areas of soils that have fewer rock fragments in the profile than the Berks soil and areas of soils that have slopes of less than 25 percent or more than 35 percent. Included soils make up about 25 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. A few are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of this soil. Erosion is a management concern when timber is harvested. The limitations for operability of logging equipment and construction of haul roads and skid roads are moderate. The limitations for construction of landings are severe. The most important limiting factor is the slope, which is minimized when soil is excavated during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of the included well drained soils. Roads should not be used during wet periods. If roads must be used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

The slope and small stones are the main limitations affecting most recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing the facilities so that they conform to the natural slope of the land. The stones should be removed.

This soil has poor potential for woodland wildlife habitat. Many areas, however, support abundant populations of small and large game species, especially in the Boyer area, the Back Mountain Road area north of Cloverlick, and near Watoga State Park. These populations rely heavily on adjacent, more suitable habitat areas for food and water. The potential of the soil for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings with grasses and legumes beneficial to wildlife; and creating grassy openings in the overstory.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Areas of included soils that are less sloping and that are deeper to bedrock are better suited to urban development.

The capability subclass is VIe. The woodland ordination symbol is 3R on north and south aspects.

BfC—Berks channery silt loam, 3 to 15 percent slopes, very stony

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically in the eastern half of the county on convex ridgetops and broad benches. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are small areas of the moderately deep Dekalb soils on the main ridgetops and the shallow Weikert soils on the spur ridgetops. Also included are areas of soils that have slopes of more than 15 percent and areas where stones cover more than 3 percent of the surface. Inclusions make up about 20 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is medium or rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on this soil. Erosion on roads, skid trails, and log landings is a major management concern. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

Large and small stones and the slope are the main limitations on sites for camping and picnicking. They prevent this soil from being used as a site for playgrounds unless extensive excavation is undertaken.

This soil has poor potential for woodland wildlife habitat. Many areas, however, support an abundant population of small and large game species, especially in the Boyer area, the Back Mountain Road area north of Clover Lick, and the area near Watoga State Park.

The stones, the depth to bedrock, and the slope are the main limitations affecting urban uses. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban development.

The stones and the slope are the main limitations on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the restrictive features. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The stones and the slope are the main limitations on sites for local roads and streets. Constructing roads and streets on the contour and removing the stones minimize the restrictive features.

The capability subclass is VIs. The woodland ordination symbol is 3A.

BfE—Berks channery silt loam, 15 to 35 percent slopes, very stony

This soil is moderately deep, very steep, and well drained. It is typically in the eastern half of the county on the upper side slopes and benches. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are small areas of the moderately deep Dekalb soils and the shallow Weikert soils. Also included are areas of soils that have slopes of less than 15 percent or more than 35 percent and areas where stones cover more than 3 percent of the surface. Inclusions make up about 25 percent of the unit.

The available water capacity is very low to moderate in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid or very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of this soil. Seedling mortality is a concern on both aspects. Erosion on roads and skid trails is a major management concern. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate on south aspects. Laying out roads and skid trails on the contour and seeding these areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

This soil has severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

This soil has poor potential for woodland wildlife habitat. Many areas, however, support an abundant population of small and large game species, especially in the Boyer area, the Back Mountain Road area north of Clover Lick, and the area near Watoga State Park.

The slope and the depth to bedrock are the main limitations affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north and south aspects.

BfF—Berks channery silt loam, 35 to 55 percent slopes, very stony

This soil is moderately deep, very steep, and well drained. It is typically in the eastern half of the county on side slopes. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with this soil in mapping are small areas of the moderately deep Dekalb soils and the shallow Weikert soils. Also included are areas of soils that have slopes of less than 35 percent or more than 55 percent and areas where stones cover more than 3 percent of the surface. Inclusions make up about 25 percent of the unit.

The available water capacity is very low or low in the Berks soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some small areas are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of this soil. Seedling mortality is a concern on both aspects. The slope limits the use of certain types of logging equipment. Erosion on roads and skid trails is a major management concern. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate. Because of the slope, special equipment and management techniques are needed when timber is harvested. Laying out roads and skid trails on the contour and seeding these areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

This soil has severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

This soil has poor potential for woodland wildlife habitat. Many areas, however, support an abundant population of small and large game species, especially in the Boyer area, the Back Mountain Road area north of Clover Lick, and the area near Watoga State Park.

The slope and the depth to bedrock are the main limitations affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north and south aspects.

BgC—Berks-Dekalb complex, 3 to 15 percent slopes, very stony

This map unit consists of strongly sloping and gently sloping, well drained, moderately deep soils on benches and ridgetops. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 60 percent Berks soil, 30 percent Dekalb soil, and 10 percent other soils.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Included with these soils in mapping are small areas of the well drained Lily soils and the moderately well drained Blairton soils. Also included are areas where stones cover more than 3 percent of the surface and areas of soils that have slopes of more than 15 percent.

The available water capacity is very low or low in the Berks soil and very low to moderate in the Dekalb soil. Permeability is moderate or moderately rapid in the subsoil of the Berks soil and rapid in the subsoil of the Dekalb soil. Runoff is rapid or medium on both soils, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of these soils are wooded. Some are used as pasture. They are mainly along Back Allegheny Mountain.

These soils are not suited to cultivated crops or hay, but they are suited to pasture. The hazard of erosion in unprotected areas is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on these soils. No major limitations affect harvesting. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, installing water bars, and revegetating disturbed areas help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, hickory, red maple, and chestnut oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon’s seal, and dogbane.

These soils have severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have poor or fair potential for woodland wildlife habitat. Many areas, however, provide cover for an abundant population of small and large game species. These populations rely heavily on adjacent areas for food and water. The potential of the soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

Stones, the depth to bedrock, and the slope are the main limitations affecting urban uses. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban development.

The stones and the slope are limitations on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the restrictive feature of these soils for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The stones and the slope are the main limitations affecting the use of these soils for local roads and streets. Constructing roads and streets on the contour and removing the stones minimize the restrictive features.

The capability subclass is VIs. The woodland ordination symbol is 3A.

BgE—Berks-Dekalb complex, 15 to 35 percent slopes, very stony

This map unit consists of steep and moderately steep, well drained, moderately deep soils on benches and side slopes. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 55 percent Berks soil, 35 percent Dekalb soil, and 10 percent other soils.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Included with these soils in mapping are small areas of the well drained Lily and Weikert soils. Also included are areas where stones cover more than 3 percent of the surface and areas of soils that have slopes of less than 15 percent or more than 35 percent.

The available water capacity is very low or low in the Berks soil and very low to moderate in the Dekalb soil. Permeability is moderate in the subsoil of the Berks soil and moderately rapid in the substratum. It is moderately rapid or rapid in the Dekalb soil. Runoff is rapid or very rapid on both soils, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of these soils are wooded. Some are used as pasture. They are mainly along Back Allegheny Mountain.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of these soils. The limitations for operability of logging equipment and construction of haul roads and skid trails are moderate. The limitations for construction of log landings are severe. The most important limiting factor is the slope, which is minimized when the soils are excavated during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of the included soils. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, red maple, yellow buckeye, chestnut oak, and black cherry. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

These soils have severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have poor or fair potential for woodland wildlife habitat. Many areas, however, provide cover for an abundant population of small and large game species. These populations rely heavily on adjacent areas for food and water. The potential of the soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

Because of the slope, the depth to bedrock, and the stones, these soils are unsuited to urban development. Areas of included soils that are less sloping, are deeper to bedrock, and have fewer stones on the surface are better suited to urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north and south aspects of the Berks soil. It is 3R on north aspects of the Dekalb soil and 2R on south aspects.

BgF—Berks-Dekalb complex, 35 to 55 percent slopes, very stony

This map unit consists of very steep, well drained, moderately deep soils on side slopes. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 45 percent Berks soil, 40 percent Dekalb soil, and 15 percent other soils.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Included with these soils in mapping are small areas of the well drained Weikert soils. Also included are areas where stones cover more than 3 percent of the surface and areas of soils that have slopes of less than 35 percent or more than 55 percent.

The available water capacity is very low or low in the Berks soil and very low to moderate in the Dekalb soil. Permeability is moderate or moderately rapid in the subsoil of the Berks soil and rapid in the subsoil of the Dekalb soil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of these soils are wooded. Some small areas are used as pasture.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of these soils. The limitations for operability of logging equipment and the construction of haul roads, skid roads, and log landings are severe. The most important limiting factor is the slope, which is minimized when the soils are excavated during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of included soils. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion. Consideration should be given to using special equipment, such as that used for cable yarding, when timber is harvested.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, red maple, yellow buckeye, chestnut oak, and black cherry. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon’s seal, and dogbane.

These soils have severe limitations affecting recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have poor or fair potential for woodland wildlife habitat. Many areas of these soils, however, provide cover for an abundant population of small and large game species. These populations rely heavily on adjacent areas for food and water. The potential of the soils for wildlife habitat can be improved by seeding abandoned haul roads, skid trails, and landings and by creating openings in the overstory to promote the growth of ground vegetation.

Because of the slope, the depth to bedrock, and the stones, these soils are unsuited to urban development. The included soils also are unsuited to most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north and south aspects of the Berks soil. It is 3R on north aspects of the Dekalb soil and 2R on south aspects.

BhG—Berks, Weikert, and Calvin soils, 55 to 80 percent slopes, very stony

This map unit consists of shallow and moderately deep, well drained soils on extremely steep side slopes in the eastern half of the county. Most of the acreage in the unit is in Monongahela National Forest. Slopes range from 55 to 80 percent but are dominantly 55 to 65 percent. Stones cover 1 to 3 percent of the surface. The soils were mapped together because they have no major differences in use and management. The unit is about 35 percent Berks soil, 25 percent Weikert soil, 20 percent Calvin soil, and 20 percent other soils.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Typically, the surface layer of the Weikert soil is dark brown channery silt loam about 1 inch thick. It is underlain by yellowish brown very channery silt loam about 5 inches thick. The subsoil also is yellowish brown very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. Multicolored siltstone and shale bedrock is at a depth of about 15 inches.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Included with these soils in mapping are small areas of the sandier Dekalb soils, areas of soils weathered from cherty material, and areas of soils that are more than 40 inches deep over bedrock. Also included are small areas of soils that have slopes of less than 55 percent or more than 80 percent, areas where stones cover less than 1 percent or more than 3 percent of the surface, and areas of rock outcrop.

The available water capacity is very low or low in the Berks soil, very low in the Weikert soil, and low or moderate in the Calvin soil. Permeability is moderate or moderately rapid in the subsoil of the Berks soil and moderately rapid in the subsoil of the Weikert and Calvin soils. Runoff is very rapid on all three soils, and natural fertility is low. Reaction is extremely acid to strongly acid in unlimed areas of the Berks soil and very strongly acid or strongly acid in unlimed areas of the Weikert and Calvin soils. The bedrock generally is soft; however, layers of hard bedrock can occur. These soils are susceptible to downslope movement. The depth to bedrock ranges from 10 to 20 inches in the Weikert soil and from 20 to 40 inches in the Berks and Dekalb soils.

All areas of these soils are wooded. The soils are not suited to cultivated crops, hay, pasture, or urban development because of the slope.

The potential productivity for trees is moderate or moderately high on north aspects of these soils and moderate on south aspects. The limitations for harvesting timber are severe. The major limitation is the slope. Erosion is a management concern. Log landings should be constructed in adjacent, less sloping areas, such as on ridgetops or benches. Constructing haul roads and skid trails in areas of these soils requires a very large amount of excavation, which greatly increases the potential for erosion. The rock outcrop, which is hard and cannot be ripped, is a problem during road construction in some areas. Where possible, haul roads should be built in adjacent, less sloping areas. If haul roads and skid trails are constructed on these soils, they should be constructed on a gentle grade across the slope. Full bench construction is recommended on haul roads. Planting wide filter strips along streams, controlling surface runoff on roads, trails, and landings by installing ditches, dips, and water bars, and seeding bare areas help to control erosion. Alternate logging systems, such as high lead cable logging, that are adapted to the slope are recommended when timber is harvested. These systems allow an area to be harvested without the use of skid trails, thus greatly reducing the potential for erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, chestnut oak, eastern hemlock, eastern white pine, pitch pine, hickory, red maple, and scarlet oak. The dominant plant communities in the understory are white oak, eastern white pine, eastern hemlock, common serviceberry, black locust, mountain laurel, huckleberry, witch hazel, maple-leaved viburnum, and striped maple, and those in the ground cover are grasses, ferns, wild lily of the valley, partridge berry, hairy disporum, twisted stalk, false Solomon's seal, and dogbane.

These soils have severe limitations affecting recreational development. Trails can be built in areas of the soils; however, construction is difficult. Erosion is a management concern. Trails should be established on a gentle grade across the slope. Switchbacks may be necessary on the trails. Water bars help to control erosion. Periodic maintenance of the trails is necessary because the soils from cutbanks slough onto the trails.

These soils have very poor or fair potential for woodland wildlife habitat. Because of the extremely steep slope, game species make limited use of the soils for food and shelter.

Because of the slope, these soils are unsuited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north and south aspects of the Berks soil; 2R on north and south aspects of the Weikert soil; and 4R on north aspects of the Calvin soil and 3R on south aspects.

BlC—Blackthorn channery loam, 3 to 15 percent slopes, extremely stony

This soil is very deep, strongly sloping and gently sloping, and well drained. It is typically on foot slopes and benches in the eastern half of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is dark brown channery loam about 4 inches thick. It is overlain by about 1 inch of highly decomposed forest litter and underlain by about 5 inches of brown very channery loam. The upper 8 inches of the subsoil is yellowish brown very channery loam, the next 33 inches is yellowish brown very channery sandy loam, and the lower 14 inches is strong brown silty clay.

Included with this soil in mapping are areas of the moderately deep Faywood, Dekalb, Calvin, and Berks soils, the deep Hazleton soils, and the very deep Elliber soils. Also included are areas of soils that have fewer rock fragments in the profile and on the surface than the Blackthorn soil and areas of soils that have slopes of less than 3 percent or more than 15 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Blackthorn soil. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderately slow or moderate in the lower part. Runoff is medium or rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid to moderately acid in the upper part of the soil profile and very strongly acid or strongly acid in the lower part. Depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. A few small areas in the vicinity of Dunmore are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is the only management concern affecting woodland productivity. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. No major limitations affect harvesting. Although the soil is extremely stony, the stones are small enough that they do not interfere with woodland management activities. Roads should not be used during wet periods. If roads are used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, installing water bars, and revegetating disturbed areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, cucumbertree, and black locust. The dominant plant communities in the understory are white pine, black locust, flowering dogwood, and white oak, and those in the ground cover are mosses, teaberry, grasses, and ferns.

Large and small stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. The areas of woodland support fairly large populations of woodland game species, such as black bear, white-tailed deer, gray and red squirrels, wild turkey, and ruffed grouse; and nongame species, such as pileated woodpeckers, reptiles, and a wide variety of songbirds, especially in the Calvin Price State Forest area.

The slope and the stones are the main limitations affecting urban uses. The slope is a moderate limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. Land shaping, installing distribution lines and roads on the contour, and selecting areas of included soils that are less sloping minimize the restrictions.

The capability subclass is VIIs. The woodland ordination symbol is 4X.

BlE—Blackthorn channery loam, 15 to 35 percent slopes, extremely stony

This soil is very deep, steep and moderately steep, and well drained. It is typically on foot slopes and benches in the eastern half of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is dark brown channery loam about 4 inches thick. It is overlain by about 1 inch of highly decomposed forest litter and underlain by about 5 inches of brown very channery loam. The upper 8 inches of the subsoil is yellowish brown very channery loam, the next 33 inches is yellowish brown very channery sandy loam, and the lower 14 inches is strong brown silty clay.

Included with this soil in mapping are areas of the moderately deep Faywood, Dekalb, Calvin, and Berks soils, the deep Hazleton soils, and the very deep Elliber soils. Also included are areas of soils that have fewer rock fragments in the profile and on the surface than the Blackthorn soil and areas of soils that have slopes of less than 15 percent or more than 35 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Blackthorn soil. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderately slow or moderate in the lower part. Runoff is rapid or very rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid to moderately acid in the upper part of the profile and very strongly acid or strongly acid in the lower part. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some small areas in the vicinity of Dunmore are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is a moderate limitation affecting woodland productivity. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. The limitations for operability of logging equipment and the construction of haul roads and skid roads are moderate. Although the soil is extremely stony, the stones are small enough that they do not interfere with woodland management activities. Haul roads, skid trails, and log landings are needed for equipment accessibility. Erosion is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas reduces erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, cucumbertree, and black locust. The dominant plant communities in the understory are white pine, black locust, flowering dogwood, and white oak, and those in the ground cover are mosses, teaberry, grasses, and ferns.

Large and small stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading, by designing facilities so that they conform to the natural slope of the land, and by laying out trails on gentle grades across the slope. Installing water-control structures helps to control surface runoff. Removing the stones minimizes their effect on recreational development.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. The areas of woodland support fairly large populations of woodland game species, such as black bear, white-tailed deer, gray and red squirrels, wild turkey, and ruffed grouse; and nongame species, such as pileated woodpeckers, reptiles, and a wide variety of songbirds, especially in the Calvin Price State Forest area.

The slope is the main limitation affecting most urban uses. This soil essentially is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

BlF—Blackthorn channery loam, 35 to 55 percent slopes, extremely stony

This soil is very deep, very steep, and well drained. It is typically on foot slopes, benches, and side slopes in the eastern half of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is dark brown channery loam about 4 inches thick. It is overlain by about 1 inch of highly decomposed forest litter and underlain by about 5 inches of brown very channery loam. The upper 8 inches of the subsoil is yellowish brown very channery loam, the next 33 inches is yellowish brown very channery sandy loam, and the lower 14 inches is strong brown silty clay.

Included with this soil in mapping are areas of the moderately deep Faywood, Dekalb, Calvin, and Berks soils, the deep Hazleton soils, and the very deep Elliber soils. Also included are areas of soils that have fewer rock fragments in the profile and on the surface than the Blackthorn soil and areas of soils that have slopes of less than 35 percent or more than 55 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Blackthorn soil. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderately slow or moderate in the lower part. Runoff is very rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid to moderately acid in the upper part of the profile and very strongly acid or strongly acid in the lower part. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. A few small areas are pastured.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is a moderate limitation affecting woodland productivity. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. The limitations for most logging operations are severe on this soil. Although the soil is extremely stony, the stones are small enough that they do not interfere with woodland management activities. When timber is harvested, the slope and the hazard of erosion restrict the use of wheeled and tracked equipment in skidding operations. Haul roads, skid trails, and log landings are needed for equipment accessibility. Erosion is a major management concern in these areas. It is a severe hazard in areas that have been cut and filled for roads. Establishing a plant cover in these areas reduces erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, cucumbertree, and black locust. The dominant plant communities in the understory are eastern white pine, black locust, flowering dogwood, and white oak, and those in the ground cover are mosses, teaberry, grasses, and ferns.

Large and small stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading, by designing facilities so that they conform to the natural slope of the land, and by laying out trails on gentle grades across the slope. Installing water-control structures helps to control surface runoff. Removing the stones minimizes their effect on recreational development.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. The areas of woodland support fairly large populations of woodland game species, such as black bear, white-tailed deer, gray and red squirrels, wild turkey, and ruffed grouse; and nongame species, such as pileated woodpeckers, reptiles, and a wide variety of songbirds, especially in the Calvin Price State Forest area.

The slope is the main limitation affecting most urban uses. This soil is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

BoB—Blairton silt loam, 3 to 8 percent slopes

This soil is moderately deep, gently sloping, and moderately well drained. It is on flats and in depressions in the uplands throughout the county.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsoil is about 22 inches thick. The upper 3 inches is dark yellowish brown silt loam; the next 8 inches is yellowish brown silt loam; the next 6 inches is light olive brown silty clay loam that has grayish brown, light olive brown, and strong brown mottles; and the lower 5 inches is light olive brown very channery silty clay loam that has grayish brown and strong brown mottles. The substratum is dark grayish brown, light olive brown, and strong brown extremely channery silt loam. Highly weathered siltstone bedrock and fine grained sandstone bedrock is at a depth of about 34 inches.

Included with this soil in mapping are a few small areas of the well drained Berks, Dekalb, Lily, and Shouns soils. Also included are areas of soils that have slopes of more than 8 percent, areas of soils that have gray mottles higher in the profile than the Blairton soil, areas of soils that have stones on the surface, and areas of soils that are similar to the Blairton soil but are mapped at elevations having a shorter growing season than is typical of the Blairton soil. Included soils make up about 15 percent of the unit.

The available water capacity is low or moderate in the Blairton soil. Permeability is moderately slow in the subsoil. Runoff and natural fertility are medium. In unlimed areas reaction is extremely acid or very strongly acid. The root zone of some types of plants is restricted by the seasonal high water table at a depth of 12 to 24 inches and by bedrock at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Only a few small areas are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. The seasonal high water table may delay cultivation in the spring. If the soil is cultivated, applying a system of conservation tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates, rotation grazing, and deferred grazing in the spring until the soil is reasonably firm are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition can be controlled by removing competing vegetation. Equipment should not be operated when the soil is wet and soft.

The dominant plant communities in the overstory on this soil are northern red oak, white ash, and yellow poplar. The dominant plant communities in the understory are flowering dogwood, mountain laurel, rhododendron, and huckleberry, and those in the ground cover are mosses, teaberry, grasses, and ferns.

The wetness is the main limitation affecting recreational development in areas of this soil. Installing a drainage system in areas used for camping or picnicking or as playgrounds reduces the wetness. Trails should be located in areas of soils that are not so wet as this soil.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds.

The wetness, the depth to bedrock, the moderately slow permeability, and the potential for frost action are the main limitations affecting most urban uses. The wetness is the main limitation on sites for dwellings. Installing footer drains and properly designed footers, backfilling with porous material, and selecting areas of included well drained soils for the homesites minimize these limitations.

The wetness and the potential for frost action are the main limitations on sites for local roads and streets. The addition of raised, coarse grained base material to frost depth and a surface and subsurface drainage system minimize these limitations.

The depth to bedrock and the wetness are limitations affecting sanitary facilities. Selecting areas of included well drained soils as sites for sanitary facilities, installing a drainage system around the absorption field, or installing a specially designed system or an alternate system approved by the county sanitarian may help to minimize these limitations.

The capability subclass is IIw. The woodland ordination symbol is 4A.

BrF—Briery-Rock outcrop complex, very steep

This map unit consists of a very deep, well drained Briery soil and areas of Rock outcrop where coal has been surface mined. It is about 70 percent Briery soil, 15 percent Rock outcrop, and 15 percent other soils. The Briery soil and the Rock outcrop were mapped together because it was not practical to map them separately at the scale selected for mapping. The unit is mostly on mountain side slopes. It is on nearly vertical highwalls, nearly level to strongly sloping benches, and steep to extremely steep outslopes. Areas on the highwalls make up about 15 percent of the unit, those on the benches make up about

45 percent, and those on the outslopes make up about 40 percent. The benches are concave and have slopes of 0 to 15 percent. The outslopes are convex and have slopes of 15 to 80 percent. Stones and boulders dominantly cover 1 to 3 percent of the surface, but the extent of the coverage in most areas ranges from 1 to 15 percent.

Typically, the surface layer of the Briery soil is very dark grayish brown very channery silt loam about 2 inches thick. The upper 19 inches of the substratum is dark brown very channery silt loam that has strong brown and gray lithochromic mottles. The lower part to a depth of more than 60 inches is dark brown extremely channery silty clay loam.

The Rock outcrop occurs as exposures of bedrock that have resulted from surface mining. The highwalls are vertical or nearly vertical and extend about 15 to 75 feet above the benches.

Included in this unit in mapping are areas of soils that have bedrock within a depth of 60 inches, small wet areas on the benches, and areas where stones and boulders cover less than 1 percent or more than 3 percent of the surface.

The available water capacity is low to high in the Briery soil. Permeability is moderate or moderately rapid. Runoff is slow or medium on bench slopes and rapid or very rapid on outslopes. Natural fertility is medium. Reaction is strongly acid to slightly alkaline in unlimed areas of the Briery soil.

Most areas of this unit are wooded. Some reclaimed areas on benches are in grasses and legumes. The areas of Rock outcrop generally are barren.

Most areas of this unit are not suited to cultivated crops or hay. They are difficult to manage for pasture because of the slope, the stoniness, and the short growing season in areas of the Briery soil. In the less sloping areas on benches, the unit is suited to pasture. Some of these areas are used for the production of hay. Erosion is a concern if pastured areas are overgrazed. Deferring grazing, applying a rotation grazing system, applying lime and fertilizer when needed, and planting desirable species help to establish and maintain good forage and control erosion.

The potential productivity for trees is moderately high in areas of this unit. The Briery soil is suited to coniferous and deciduous trees. In most areas the trees are not large enough to harvest for saw logs. Seedling mortality is a hazard. Few limitations affect harvesting in areas on benches. The slope and the Rock outcrop are moderate and severe limitations affecting harvesting in areas on the highwalls and outslopes. Erosion is a hazard on steep slopes in the disturbed areas. Constructing roads on a gentle grade across the slope and revegetating disturbed areas help to control erosion.

The dominant plant communities in the overstory on this Briery soil are red pine, scotch pine, and black locust. The dominant plant communities in the understory are red spruce and yellow birch, and those in the ground cover are grasses and legumes.

This map unit has severe limitations affecting most recreational uses. Large and small stones, the slope, and the Rock outcrop are the major restrictive features.

This map unit has fair potential for woodland wildlife habitat. Black bear, white-tailed deer, ruffed grouse, and snowshoe hare use these areas for cover and as a source of food.

The main restrictive features of this unit for urban uses are stones and boulders, the very steep outslopes, the potential for differential settling, and the Rock outcrop. Onsite investigation and testing are needed to determine the limitations and potentials of the unit for most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

CaC—Calvin channery silt loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is typically on ridgetops near the Greenbrier River and on Allegheny Mountain.

Typically, the surface layer is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Included with this soil in mapping are a few small areas of the moderately deep Berks and Dekalb soils. Also included are areas of soils having a solum that is less than 20 inches thick, areas of soils that have stones on the surface, areas of soils that have fewer rock fragments in the profile than the Calvin soil, and areas of soils that have slopes of less than 8 percent or more than 15 percent. Inclusions make up about 20 percent of the unit.

The available water capacity is low or moderate in the Calvin soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderate on this soil. Erosion on roads, skid trails, and log landings and seedling mortality of planted stock are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Special stock that has a well developed root system, containerized seedlings, and special site preparation, such as furrowing, reduce the seedling mortality rate. Planting early in spring to take full advantage of rainfall also reduces the seedling mortality rate. Harvest methods that do not fully remove the overstory increase the seedling survival rate. The remaining trees provide partial shade for seedlings and thus minimize the loss of moisture. The limitations affecting haul roads, skid trails, and landings are moderate. The major limitations are low strength and the slope. A minor amount of excavation on landings and haul roads helps to overcome the slope. Restricting the use of roads and landings during wet periods and adding gravel to the surface help to increase soil strength. Planting filter strips along streams and water breaks and seeding bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, red maple, and black locust. The dominant plant communities in the understory are white oak, red maple, striped maple, rhododendron, witch hazel, hop hornbeam, flowering dogwood, and blueberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

Small and large stones, the slope, and the depth to bedrock are the main limitations affecting recreational development in areas of this soil. Excavation is necessary to create level areas for most recreational uses. Standard septic tank absorption fields may not function properly. An alternate system or a self-contained system, such as sealed vault toilets, may be used. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Seeding bare areas following construction reduces the hazard of erosion. No major limitations affect the construction of trails.

This soil has good potential for openland wildlife habitat and fair potential for woodland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and turkey are abundant in areas of the soil. They feed in the open areas and use the edges for cover.

The depth to bedrock and the slope are the main limitations affecting urban development. Areas of included soils that are more than 40 inches deep over bedrock have fewer restrictive features affecting most urban uses.

The depth to bedrock and the slope are the main limitations on sites for dwellings with basements, and the slope is the main limitation on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. The bedrock is soft in most areas and, in many cases, can be excavated using standard methods.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The slope is the main limitation on sites for local roads and streets. Constructing roads and streets on the contour and adding coarse grained base material minimize this restrictive feature.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 3A.

CbC—Calvin channery silt loam, 3 to 15 percent slopes, very stony

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically on ridgetops near the Greenbrier River and on Allegheny and Burner Mountains. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Included with this soil in mapping are a few small areas of the moderately deep Berks and Dekalb soils. Also included are areas of soils having a solum that is less than 20 inches thick, areas where stones cover less than 1 percent of the surface, areas of soils that have fewer rock fragments in the profile than the Calvin soil, and areas of soils that have slopes of more than 15 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is low or moderate in the Calvin soil. Permeability is moderately rapid in the subsoil. Runoff is medium or rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on this soil. Seedling mortality of planted stock is a management concern on south aspects because of the droughtiness of the soil. Special stock that has a well developed root system, containerized seedlings, or special site preparation, such as furrowing, reduce the seedling mortality rate. Planting early in spring to take full advantage of rainfall also reduces the seedling mortality rate. Harvest methods that do not fully remove the overstory increase the seedling survival rate. The remaining trees provide partial shade for seedlings and thus minimize the loss of moisture. The limitations affecting haul roads, skid trails, and landings are moderate. The major limitations are low strength and the slope. A minor amount of excavation on landings and haul roads helps to overcome the slope. Restricting the use of roads and landings during wet periods and adding gravel to the surface help to increase soil strength. Planting filter strips along streams, installing water bars, and seeding bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, red maple, and black locust. The dominant plant communities in the understory are white oak, red maple, striped maple, rhododendron, witch hazel, hop hornbeam, flowering dogwood, and blueberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

Small and large stones, the slope, and the depth to bedrock are the main limitations affecting recreational development. Excavation is necessary to create level areas for most recreational uses. Standard septic tank absorption fields may not function properly. An alternate system or a self-contained system, such as sealed vault toilets, may be used. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Seeding bare areas following construction reduces the hazard of erosion. No major limitations affect the construction of trails.

This soil has fair potential for woodland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and turkey are abundant in areas around Seneca State Forest.

The depth to bedrock and the slope are the main limitations affecting urban development. Areas of included soils that are more than 40 inches deep over bedrock have fewer restrictive features affecting most urban uses.

The depth to bedrock and the slope are the main limitations on sites for dwellings with basements, and the slope is the main limitation on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. The bedrock is soft in most areas and, in many cases, can be excavated.

Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The slope is the main limitation on sites for local roads and streets. Constructing roads and streets on the contour and adding coarse grained base material minimize this restrictive feature.

The capability subclass is VIs. The woodland ordination symbol is 3A.

CbE—Calvin channery silt loam, 15 to 35 percent slopes, very stony

This soil is moderately deep, steep and moderately steep, and well drained. It is typically on ridgetops and side slopes near the Greenbrier River and on Allegheny and Burner Mountains. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Included with this soil in mapping are many small areas of the moderately deep Berks soils and a few small areas of the moderately deep Dekalb soils on ridgetops and side slopes. Also included are areas of soils that are less than 20 inches deep over bedrock, areas where stones cover less than 1 percent of the surface, areas of soils that have slopes of less than 15 percent or more than 35 percent, and some areas of exposed bedrock. Inclusions make up about 25 percent of the unit.

The available water capacity is low or moderate in the Calvin soil. Permeability is moderately rapid in the subsoil. Runoff is rapid or very rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. The limitations for operability of logging equipment and the construction of haul roads and skid trails are moderate. The limitations for construction of log landings are severe. The major limitations are the slope and low strength. The effects of the slope can be minimized when the soil is excavated during the construction of haul roads, skid trails, and landings. Where possible, landings should be constructed in the less sloping areas of the included well drained soils. Restricting the use of roads during wet periods and adding gravel to the surface help to increase strength. Erosion is a management concern. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid trails on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, red maple, and black locust. The dominant plant communities in the understory are white oak, red maple, striped maple, rhododendron, witch hazel, hop hornbeam, flowering dogwood, and blueberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

The slope is the major limitation affecting recreational development in areas of this soil. Excavation is necessary to create level areas for camping and picnicking and for use as playgrounds. Designing trails and fairways so that they conform to the natural slope of the land reduces the effects of the slope. The stoniness is a limitation on sites for playgrounds. The stones should be removed. Standard septic tank absorption fields may not function properly. Alternate systems or self-contained systems, such as sealed vault toilets, can be installed in the less sloping areas. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Revegetation of bare soils reduces the hazard of erosion.

This soil has fair potential for woodland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and turkey are abundant in areas of this soil around Seneca State Forest.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Areas of included soils that have slopes of 8 to 15 percent or that are deeper to bedrock have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

CbF—Calvin channery silt loam, 35 to 55 percent slopes, very stony

This soil is moderately deep, very steep, and well drained. It is typically on side slopes near the Greenbrier River and on Allegheny and Burner Mountains. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Included with this soil in mapping are many small areas of the moderately deep Berks soils and a few small areas of the moderately deep Dekalb soils on side slopes. Also included are some small areas of the deep Shouns soils in coves and on foot slopes, areas of soils that are less than 20 inches deep over bedrock, areas where stones cover less than 1 percent of the surface, areas of soils that have slopes of less than 35 percent or more than 55 percent, and some areas of exposed bedrock. Inclusions make up about 25 percent of the unit.

The available water capacity is low or moderate in the Calvin soil. Permeability is moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. The limitations for harvesting timber are severe. The major limitation is the slope. Erosion is a management concern. Haul roads and skid trails should be constructed on a gentle grade across the slope. Log landings should be constructed in the less sloping, well drained areas of the included soils. Roads and landings should not be used during wet periods. If roads are used when the soil is wet, adding gravel to the surface minimizes the formation of ruts and strengthens the roadbed. Controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, planting filter strips along streams, and keeping the total mileage of roads and skid trails to a minimum help to control erosion. A cable logging system also helps to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, red maple, and black locust. The dominant plant communities in the understory are white oak, red maple, striped maple, rhododendron, witch hazel, hop hornbeam, flowering dogwood, and blueberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

The slope is the major limitation affecting recreational development in areas of this soil. Excavation is necessary to create level areas for camping and picnicking and for use as playgrounds. Designing trails and fairways so that they conform to the natural slope of the land reduces the effects of the slope. The stoniness is a limitation on sites for playgrounds. The stones should be removed. Standard septic tank absorption fields may not function properly. Alternate systems or self-contained systems, such as sealed vault toilets, can be installed in the less sloping areas. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Revegetation of bare soils reduces the hazard of erosion.

This soil has fair potential for woodland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and turkey are abundant on this soil in the areas around Seneca State Forest.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Areas of included soils that are less sloping and deeper to bedrock have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

CdC—Calvin-Dekalb-Berks complex, 3 to 15 percent slopes, very stony

This map unit consists of strongly sloping and gently sloping, well drained, moderately deep soils on benches, ridgetops, and shoulder slopes, mainly on Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 45 percent Calvin soil, 25 percent Dekalb soil, 20 percent Berks soil, and 10 percent other soils.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches of the subsoil is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with these soils in mapping are areas of the well drained Blackthorn and Hazleton soils and areas of soils that do not have stones on the surface. Also included are areas of soils that have slopes of less than 3 percent or more than 15 percent.

The available water capacity is low or moderate in the Calvin soil, very low to moderate in the Dekalb soil, and very low or low in the Berks soil. Permeability is moderately rapid in the subsoil of the Calvin soil, rapid in the subsoil of the Dekalb soil, and moderate or moderately rapid in the subsoil of the Berks soil. Runoff is medium or rapid on all three soils, and natural fertility is low. Reaction is very strongly acid or strongly acid in unlimed areas of the Calvin soil and extremely acid to strongly acid in unlimed areas of the Dekalb and Berks soils. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches. The bedrock underlying the Calvin and Berks soils is rippable.

Most areas of these soils are wooded. They are used for timber production and wildlife habitat.

These soils are not suited to cultivated crops or hay, but they are suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on these soils. No major limitations affect harvesting. Roads should not be used during wet periods. If roads must be used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, installing water bars, and revegetating disturbed areas help to control erosion. Plant competition is a management concern. Harvest methods that do not remove all of the overstory or applications of herbicides to control vegetation reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave single trees or a group of trees are not recommended.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, pitch pine, hickory, red maple, eastern white pine, and black locust. The dominant plant communities in the understory are mountain laurel, witch hazel, flowering dogwood, sassafras, American chestnut, black locust, striped maple, blueberry, honeysuckle, and blackberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

Small and large stones, the slope, and the depth to bedrock are the main limitations affecting most recreational development in areas of these soils. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion. The stones should be removed.

These soils have poor or fair potential for woodland wildlife habitat. Many areas of these soils, however, provide cover for an abundant population of small and large game species, especially in the Beaver Lick and

Brushy Mountain areas. These populations rely heavily on adjacent areas for food and water. The potential of the soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

Stones, the depth to bedrock, and the slope are the main limitations affecting most urban uses. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban development.

The stones and the slope are limitations on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The stones and the slope are the main limitations affecting the use of these soils for local roads and streets. Constructing roads and streets on the contour and removing the stones minimize the restrictive features.

The capability subclass is VIs. The woodland ordination symbol is 3A in areas of the Calvin, Berks, and Dekalb soils.

CdE—Calvin-Dekalb-Berks complex, 15 to 35 percent slopes, very stony

This map unit consists of steep and moderately steep, well drained, moderately deep soils on benches and side slopes, mainly on Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 35 percent Calvin soil, 30 percent Dekalb soil, 20 percent Berks soil, and 15 percent other soils.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches of the subsoil is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with these soils in mapping are areas of the well drained Blackthorn and Hazleton soils and areas of soils that do not have stones on the surface. Also included are areas of soils that have slopes of less than 15 percent or more than 35 percent.

The available water capacity is low or moderate in the Calvin soil, very low to moderate in the Dekalb soil, and very low or low in the Berks soil. Permeability is moderately rapid in the subsoil of the Calvin soil, rapid in the subsoil of the Dekalb soil, and moderate or moderately rapid in the subsoil of the Berks soil. Runoff is rapid or very rapid on all three soils, and natural fertility is low. Reaction is very strongly acid or strongly acid in unlimed areas of the Calvin soil and extremely acid to strongly acid in unlimed areas of the Dekalb and Berks soils. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of these soils are wooded. They are used for timber production and wildlife habitat.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate or moderately high on north aspects of these soils and moderate on south aspects. Plant competition is a management concern in areas of the Calvin soil, especially on north-facing slopes. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. The limitations for operability of logging equipment and the construction of haul roads and skid trails are moderate. The limitations for construction of log landings are severe. The slope is the major management concern. It can be minimized during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of included soils. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, hickory, eastern white pine, red maple, and pitch pine. The dominant plant communities in the understory are mountain laurel, witch hazel, flowering dogwood, sassafras, American chestnut, black locust, striped maple, blueberry, honeysuckle, and blackberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

Small and large stones and the slope are the main limitations affecting recreational development in areas of these soils. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion. The stones should be removed.

These soils have poor or fair potential for woodland wildlife habitat. Many areas of these soils provide cover for an abundant population of small and large game species, especially in the Beaver Lick and Brushy Mountain areas. These populations rely heavily on adjacent areas for food and water. The potential of the soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

The slope, the depth to bedrock, and the stones are the main limitations affecting most urban uses. This map unit is not used for urban development. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects of the Calvin soil and 3R on south aspects; 3R on north aspects of the Dekalb soil and 2R on south aspects; and 3R on north and south aspects of the Berks soil.

CdF—Calvin-Dekalb-Berks complex, 35 to 55 percent slopes, very stony

This map unit consists of very steep, well drained, moderately deep soils on side slopes, mainly on Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain. These soils occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 35 percent Calvin soil, 25 percent Dekalb soil, 20 percent Berks soil, and 20 percent other soils.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown. The upper 2 inches of the subsoil is silt loam, the next 17 inches is channery silt loam, and the lower 6 inches is extremely channery silt loam. The substratum is reddish brown extremely channery silt loam. Reddish brown, highly weathered siltstone bedrock is at a depth of about 39 inches.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 2 inches thick. The subsoil is yellowish brown. The upper 2 inches of the subsoil is channery silt loam, and the lower 18 inches is very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, olive siltstone bedrock is at a depth of about 31 inches.

Included with these soils in mapping are areas of the well drained Blackthorn and Hazleton soils and areas of soils that do not have stones on the surface. Also included are areas of soils that have slopes of less than 35 percent or more than 55 percent.

The available water capacity is low or moderate in the Calvin soil and very low to moderate in the Dekalb and Berks soils. Permeability is moderately rapid in the subsoil of the Calvin soil, rapid in the subsoil of the Dekalb soil, and moderate or moderately rapid in the subsoil of the Berks soil. Runoff is very rapid on all three soils, and natural fertility is low. Reaction is very strongly acid or strongly acid in unlimed areas of the Calvin soil and extremely acid to strongly acid in unlimed areas of the Dekalb and Berks soils. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of these soils are wooded. They are used for timber production and wildlife habitat.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate or moderately high on north aspects of these soils and moderate on south aspects. Plant competition is a management concern in areas of the Calvin soil, especially on north-facing slopes. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. The limitations for operability of logging equipment and the construction of haul roads and skid trails are moderate. The limitations for construction of log landings are severe. The slope is the major management concern. It can be minimized during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of included soils. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, eastern white pine, hickory, pitch pine, red maple, and black locust. The dominant plant communities in the understory are mountain laurel, witchhazel, flowering dogwood, sassafras, American chestnut, black locust, blueberry, honeysuckle, striped maple, and blackberry, and those in the ground cover are marginal shield ferns, wild sarsaparilla, wild stonecrop, blunt-lobed woodsia, white snakeroot, teaberry, and grasses.

These soils have severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have poor or fair potential for woodland wildlife habitat. Many areas of these soils, however, provide cover for an abundant population of small and large game species, especially in the Beaver Lick and Brushy Mountain areas. These populations rely heavily on adjacent areas for food and water. The potential of the soil for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

The slope, the depth to bedrock, and the stones are the main limitations affecting urban uses. This map unit is not used for urban development. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban use.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects of the Calvin soil and 3R on south aspects; 3R on north aspects of the Dekalb soil and 2R on south aspects; and 3R on north and south aspects of the Berks soil.

CeB—Cateache channery silt loam, 3 to 8 percent slopes

This soil is moderately deep, gently sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock and areas of soils that have slopes of more than 8 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. Plant competition is the major management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Generally, no major limitations affect the use of equipment for logging operations; however, if unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Seeding roads, skid trails, and log landings and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

Small stones, the slope, and the depth to bedrock are the main limitations affecting most recreational development in areas of this soil. The effects of the slope can be minimized by selecting the less sloping areas of the soil for development, by land shaping and grading, and by designing the facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has good potential for openland and woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The depth to bedrock and a shrink-swell potential are the main limitations affecting most urban uses. Areas of the included Shouns soils and other soils that are more than 40 inches deep over bedrock have fewer restrictive features affecting most urban uses.

This soil is limited as a site for septic tank absorption fields because of the depth to bedrock. Septic tank absorption fields may not function properly. The effluent may come to the surface, resulting in unhealthy conditions. Choosing a better suited alternate site of deeper soils and installing a larger filter field may help to overcome this limitation.

The depth to bedrock and the shrink-swell potential are the main limitations on sites for dwellings with basements. The shrink-swell potential is the main limitation on sites for dwellings without basements. The bedrock is soft in most areas and can be excavated using standard methods. Building above the bedrock and adding fill material when landscaping minimize the effects of the restrictions caused by the depth to bedrock. Backfilling with coarse textured material and adding extra reinforcement to the footers help to prevent the damage caused by shrinking and swelling.

The shrink-swell potential is the main limitation on sites for local roads and streets. The damage caused by shrinking and swelling can be minimized by providing a coarser grained subgrade or base material.

Erosion is a moderate hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 4A.

CeC—Cateache channery silt loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a severe limitation on log landings, which are needed for equipment accessibility. Erosion is a major management concern on the landings. It is an additional concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

Small stones, the slope, and the depth to bedrock are the main limitations affecting most recreational development in areas of this soil. The effects of the slope can be minimized by selecting the less sloping areas of the soil for development, by land shaping and grading, and by designing the facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has good potential for openland and woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and turkey.

The slope, the depth to bedrock, and a shrink-swell potential are the main limitations affecting most urban uses. Areas of the included Shouns soils and other soils that are more than 40 inches deep over bedrock and have slopes of less than 8 percent have fewer restrictive features affecting most urban uses.

This soil is limited as a site for septic tank absorption fields because of the depth to bedrock. Choosing a better suited alternate site of deeper soils and installing a larger filter field may help to overcome this limitation.

The slope, the depth to bedrock, and the shrink-swell potential are the main limitations on sites for dwellings with basements. The slope and the shrink-swell potential are the main limitations on sites for dwellings without basements. Designing dwellings so that they conform to the natural slope of the land and land shaping minimize the effects of the slope. The bedrock is soft in most areas and can be excavated using standard methods. Building above the bedrock and adding fill material when landscaping minimize the effects of the restrictions caused by the depth to bedrock. Backfilling with coarse textured material and adding extra reinforcement to the footers help to prevent the damage caused by shrinking and swelling.

The slope and the shrink-swell potential are the main limitations on sites for local roads and streets. Constructing roads and streets on a gentle grade across the slope minimizes the effects of the slope. The damage caused by shrinking and swelling can be minimized by providing a coarser grained subgrade or base material.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

CeD—Cateache channery silt loam, 15 to 25 percent slopes

This soil is moderately deep, moderately steep, and well drained. It is typically on side slopes, ridgetops, and benches west of the Greenbrier River.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock and areas of soils that have slopes of less than 15 percent or more than 25 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is medium or rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a severe limitation on log landings, which are needed for equipment accessibility. Erosion is a major management concern on the landings. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

The slope is the main limitation affecting recreational development in areas of this soil. Selecting areas that are less sloping and land shaping minimize the effects of the slope in areas used for camping and picnicking and as playgrounds. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails.

This soil has fair potential for openland wildlife habitat and good potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope, the depth to bedrock, and slippage are the main limitations affecting most urban uses. Areas of the included Shouns soils and other soils that are more than 40 inches deep over bedrock and have slopes of less than 15 percent have fewer restrictive features affecting most urban uses.

The capability subclass is IVe. The woodland ordination symbol is 4R on north and south aspects.

CfC—Cateache channery silt loam, 3 to 15 percent slopes, very stony

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the very deep Shouns soils on foot slopes. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock and areas of soils that have slopes of more than 15 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is medium or rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

Small and large stones, the slope, and the depth to bedrock are the main limitations affecting most recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The depth to bedrock, the slope, and a shrink-swell potential are the main limitations affecting urban uses. Areas of the included Shouns soils and other soils that are more than 40 inches deep over bedrock have fewer restrictive features affecting most urban uses.

The depth to bedrock, the shrink-swell potential, and the slope are the main limitations on sites for dwellings with basements. The shrink-swell potential and the slope are the main limitations on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. Adding extra reinforcement to footings and backfilling with sandy material minimize the damage caused by shrinking and swelling.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is VIs. The woodland ordination symbol is 4A.

CfE—Cateache channery silt loam, 15 to 35 percent slopes, very stony

This soil is moderately deep, steep and moderately steep, and well drained. It is typically on benches and side slopes west of the Greenbrier River. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the moderately deep Gauley and Mandy soils at the higher elevations and the very deep Shouns soils. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas of soils that have slopes of less than 15 percent or more than 35 percent, and some areas of exposed bedrock. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is rapid or very rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. The slope affects the use of some types of equipment. Erosion on roads and skid trails, seedling mortality on south-facing slopes, and plant competition are the major management concerns. Laying out roads and skid trails on the contour and seeding bare areas help to control erosion. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is the major limitation affecting most logging operations. When timber is harvested, the slope restricts the use of wheeled and tracked equipment in skidding operations. Cable yarding systems generally are safer and disturb the soil less. Haul roads, skid trails, and log landings are needed for equipment accessibility. Erosion in these areas is a major management concern. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when the soil is wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

Large and small stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope, the depth to bedrock, and slippage are the main limitations affecting most urban uses. Areas of included soils that have slopes of 8 to 15 percent or are more than 40 inches deep over bedrock have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north and south aspects.

CfF—Cateache channery silt loam, 35 to 55 percent slopes, very stony

This soil is moderately deep, very steep, and well drained. It is typically on side slopes west of the Greenbrier River. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of the moderately deep Gauley and Mandy soils at the higher elevations and the very deep Shouns soils. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas of soils that have slopes of less than 35 percent or more than 55 percent, and some areas of exposed bedrock. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. The slope affects the use of some types of equipment. Erosion on roads and skid trails, seedling mortality on south aspects, and plant competition are the major management concerns. Because of the slope, special equipment or management techniques are needed when timber is harvested. Laying out roads and trails on the contour and seeding bare areas help to control erosion. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Poor logging practices can result in very severe erosion in harvested areas. The slope is the major limitation affecting most logging operations. When timber is harvested, the slope restricts the use of wheeled and tracked equipment in skidding operations. Cable yarding systems generally are safer and disturb the soil less. Haul roads, skid trails, and log landings are needed for equipment accessibility. Erosion in these areas is a major management concern. If logging roads are used year round, suitable surfacing material is needed. Unsurfaced roads are soft when wet and can be impassable during rainy periods. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Adding extra stone during road construction may be necessary to help maintain a stable, uniform road surface. Erosion is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

Small and large stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading and by designing facilities so that they conform to the natural slope of the land. Removing the stones minimizes their effect on recreational development.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope, the depth to bedrock, and slippage are the main limitations affecting most urban uses. Because of these limitations, this soil is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north and south aspects.

CfG—Cateache channery silt loam, 55 to 80 percent slopes, very stony

This soil is moderately deep, extremely steep, and well drained. It is typically on side slopes west of the Greenbrier River. Most of the acreage of the soil is in Monongahela National Forest. Slopes range from 55 to 80 percent but are dominantly 55 to 65 percent. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is about 26 inches thick. The upper 4 inches is dark reddish brown channery silt loam, the next 16 inches is reddish brown channery silty clay loam, and the lower 6 inches is reddish brown very channery silty clay loam. The substratum is reddish brown extremely channery silty clay loam. Highly weathered, dark reddish brown, fractured siltstone bedrock is at a depth of about 32 inches.

Included with this soil in mapping are a few small areas of soils that are less than 20 inches deep over bedrock, areas of soils that have slopes of less than 55 percent, and areas of rock outcrop. Inclusions make up about 20 percent of the unit.

The available water capacity is moderate in the Cateache soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid in the solum and strongly acid or moderately acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches. The soil is susceptible to downslope movement.

This soil is not suited to cultivated crops, hay, pasture, or urban development because of the slope. All of the acreage of the soil is wooded.

The potential productivity for trees is moderately high on north and south aspects of this soil. The limitations for harvesting timber are severe because of the slope. Erosion and instability are management concerns. Operating conventional skidder or tractor logging equipment and constructing roads in areas of the soil are not recommended because of the high potential for erosion and the hazard of mass soil movement. Alternate logging systems, such as high lead cable logging, that are adapted to the slope are recommended when timber is harvested. These systems allow an area to be harvested without the use of skid trails, thus greatly reducing the potential for erosion.

The dominant plant communities in the overstory on this soil are northern red oak, black cherry, cucumbertree, American beech, and sugar maple. The dominant plant communities in the understory are striped maple, mountain maple, black cherry, American beech, and black locust, and those in the ground cover are wood nettle, blue cohosh, white snakeroot, jewelweed, columbine, black cohosh, grasses, ferns, and ramps.

This soil has severe limitations affecting recreational development. Erosion and the instability of cutbanks are management concerns. Trails should not be established in areas of this soil if alternate locations are available.

This soil has fair potential for woodland wildlife habitat. Game species make only limited use of this soil for food and shelter because of the very steep slope.

This soil has extremely severe limitations for all urban development because of the slope. As a result, it is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north and south aspects.

Ch—Chavies fine sandy loam

This soil is very deep, nearly level, and well drained. It is on low stream terraces along the Greenbrier River and its major tributaries and is subject to rare flooding. The mapped areas are usually elongated. Slopes are 0 to 3 percent.

Typically, the surface layer is dark yellowish brown fine sandy loam about 8 inches thick. The subsoil is dark yellowish brown fine sandy loam about 33 inches thick. The substratum to a depth of 60 inches or more is dark yellowish brown gravelly fine sandy loam.

Included with this soil in mapping are small areas of the well drained Tioga soils, the excessively drained Potomac soils, the somewhat poorly drained Orrville soils, and the poorly drained Holly soils and areas of soils that formed on alluvial fans. The Tioga soils are on floodplains, below the Chavies soil. Also included are soils that are similar to the Chavies soil but have a gravelly surface layer. These soils are in upstream delineations along the major tributaries. Included soils make up about 15 percent of the unit.

The available water capacity is moderate or high in the Chavies soil. Permeability is moderately rapid in the subsoil. Runoff is slow or medium, and natural fertility is medium. In unlimed areas reaction is very strongly acid to neutral in the upper part of the profile and very strongly acid to moderately acid in the lower part. The depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some small wooded areas are in Monongahela National Forest.

This soil is well suited to cultivated crops, hay, and pasture. The hazard of erosion is slight. Cultivated crops can be grown continuously. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain fertility and tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are management needs in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil. Only a small acreage is wooded. Removing undesirable vegetation helps when reestablishing woodland.

The dominant plant communities in the overstory on this soil are northern red oak, yellow-poplar, red maple, American sycamore, and eastern white pine, and those in the ground cover are ground pine, grasses, and teaberry. The dominant plant community in the understory is rhododendron.

This soil has few limitations affecting most recreational development. The flooding is a hazard in areas used for camping, and stoniness is a limitation on sites used for playgrounds.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrel, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The flooding is the major limitation affecting most urban uses.

The capability class is I. The woodland ordination symbol is 4A.

CuB—Culleoka silt loam, 3 to 8 percent slopes

This soil is moderately deep, gently sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 1 inch thick. The subsoil is about 20 inches thick. The upper 2 inches is dark brown channery silt loam, the next 6 inches is yellowish brown channery silt loam, the next 8 inches is strong brown channery silt loam, and the lower 4 inches is brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Olive brown, fine grained sandstone bedrock is at a depth of about 33 inches.

Included with this soil in mapping are a few small areas of the redder Cateache soils. Also included are areas of soils that are less than 20 inches deep over bedrock and areas of soils that have slopes of more than 8 percent. Included soils make up about 10 percent of the unit.

The available water capacity is low or moderate in the Culleoka soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is medium, and natural fertility is medium or high. In unlimed areas reaction is strongly acid or moderately acid in the solum and strongly acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. Plant competition is the major management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Generally, no major limitations affect the use of equipment for logging operations; however, if unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Seeding roads, skid trails, and log landings and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, American beech, American basswood, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, black birch, American beech, and black locust, and those in the ground cover are mayapple, grasses, ferns, mosses, daisy fleabane, and Queen Anne's lace.

No limitations affect the development of camp areas, picnic areas, and paths and trails. The slope and small stones are limitations on sites for playgrounds. Choosing the most level areas of the soil and land shaping help to overcome these limitations.

This soil has good potential for openland wildlife habitat and fair potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and turkey.

The depth to bedrock, seepage, and low strength are the main limitations affecting most urban uses. The depth to bedrock is the main limitation on sites for dwellings with basements. Limitations are slight on sites for dwellings without basements. The bedrock is soft in most areas and can be excavated using standard methods. Building above the bedrock and adding fill material when landscaping minimize the effects of the restrictions caused by the depth to bedrock.

This soil is limited as a site for septic tank absorption fields because of the depth to bedrock. Choosing deeper soils or other soils and installing a larger filter field may help to overcome this limitation.

Low strength is the main limitation on sites for local roads and streets. Adding suitable subgrade or base material minimizes the damage caused by low strength.

Erosion is a moderate hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 4A.

CuC—Culleoka silt loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is typically on ridgetops and benches west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 1 inch thick. The subsoil is about 20 inches thick. The upper 2 inches is dark brown channery silt loam, the next 6 inches is yellowish brown channery silt loam, the next 8 inches is strong brown channery silt loam, and the lower 4 inches is brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Olive brown, fine grained sandstone bedrock is at a depth of about 33 inches.

Included with this soil in mapping are a few small areas of the redder Cateache soils. Also included are areas of soils that are less than 20 inches deep over bedrock and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 15 percent of the unit.

The available water capacity is low or moderate in the Culleoka soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid or moderately acid in the solum and strongly acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. The hazard of erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out trails and roads on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a limitation on log landings, which are needed for equipment accessibility. Erosion is a management concern on the landings. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, American beech, American basswood, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, black birch, American beech, and black locust, and those in the ground cover are mayapple, grasses, ferns, mosses, daisy fleabane, and Queen Anne's lace.

The slope is a moderate limitation in areas used for camping and picnicking. It is a severe limitation on sites for playgrounds. Choosing the most level areas of the soil and land shaping help to overcome the slope.

This soil has good potential for openland wildlife habitat and fair potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope, the depth to bedrock, seepage, and low strength are the main limitations affecting most urban uses. The slope and the depth to bedrock are the main limitations on sites for dwellings with basements. The slope is the main limitation on sites for dwellings without basements. The bedrock is soft in most areas and can be excavated using standard methods. Building above the bedrock and adding fill material when landscaping help to overcome the limited depth to bedrock. Backfilling with coarse textured material and adding extra reinforcement to the footers minimize the damage caused by shrinking and swelling.

This soil is limited as a site for septic tank absorption fields because of the depth to bedrock. Septic tank absorption fields may not function properly. The effluent may come to the surface, resulting in unhealthy conditions. Choosing a better suited alternate site of deeper soils and installing a larger filter field may help to overcome this limitation.

The slope and low strength are the main limitations on sites for local roads and streets. Constructing roads and streets on a gentle grade across the slope minimizes the restrictions caused by the slope. Adding suitable subgrade or base material minimizes the damage caused by low strength.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

CuD—Culleoka silt loam, 15 to 25 percent slopes

This soil is moderately deep, moderately steep, and well drained. It is typically on side slopes, ridgetops, and benches west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 1 inch thick. The subsoil is about 20 inches thick. The upper 2 inches is dark brown channery silt loam, the next 6 inches is yellowish brown channery silt loam, the next 8 inches is strong brown channery silt loam, and the lower 4 inches is brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Olive brown, fine grained sandstone bedrock is at a depth of about 33 inches.

Included with this soil in mapping are a few small areas of the redder Cateache soils. Also included are areas of soils that are less than 20 inches deep over bedrock and areas of soils that have slopes of less than 25 percent or more than 35 percent. Included soils make up about 15 percent of the unit.

The available water capacity is low or moderate in the Culleoka soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid or moderately acid in the solum and strongly acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. The hazard of erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. The hazard of erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a moderate limitation on log landings, which are needed for equipment accessibility. Erosion is a major management concern on the landings. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, American beech, American basswood, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, black birch, American beech, and black locust, and those in the ground cover are mayapple, grasses, ferns, mosses, daisy fleabane, and Queen Anne's lace.

The slope is a moderate limitation in areas used for paths and trails. It is a severe limitation affecting all other recreational development. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails. Choosing areas that are less sloping and land shaping also help to overcome the slope.

This soil has fair potential for openland and woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope is the major limitation affecting most urban uses. This soil essentially is not used for urban development.

The capability subclass is IVe. The woodland ordination symbol is 4R on north and south aspects.

CuE—Culleoka silt loam, 25 to 35 percent slopes

This soil is moderately deep, steep, and well drained. It is typically on the upper side slopes west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 1 inch thick. The subsoil is about 20 inches thick. The upper 2 inches is dark brown channery silt loam, the next 6 inches is yellowish brown channery silt loam, the next 8 inches is strong brown channery silt loam, and the lower 4 inches is brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Olive brown, fine grained sandstone bedrock is at a depth of about 33 inches.

Included with this soil in mapping are a few small areas of the redder Cateache soils. Also included are areas of soils that are less than 20 inches deep over bedrock and areas of soils that have slopes of less than 25 percent or more than 35 percent. Included soils make up about 20 percent of the unit.

The available water capacity is low or moderate in the Culleoka soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid or moderately acid in the solum and strongly acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay but is suited to pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a moderate limitation on log landings, which are needed for equipment accessibility. Erosion is a management concern on the landings. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, American beech, American basswood, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, black birch, American beech, and black locust, and those in the ground cover are mayapple, grasses, ferns, mosses, daisy fleabane, and Queen Anne's lace.

The slope is the main limitation affecting most recreational development in areas of this soil. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope.

This soil has fair potential for openland and woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope is the major limitation affecting most urban uses. This soil essentially is not used for urban development.

The capability subclass is VIe. The woodland ordination symbol is 4R on north and south aspects.

CuF—Culleoka silt loam, 35 to 55 percent slopes

This soil is moderately deep, very steep, and well drained. It is typically on side slopes west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown silt loam about 1 inch thick. The subsoil is about 20 inches thick. The upper 2 inches is dark brown channery silt loam, the next 6 inches is yellowish brown channery silt loam, the next 8 inches is strong brown channery silt loam, and the lower 4 inches is brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Olive brown, fine grained sandstone bedrock is at a depth of about 33 inches.

Included with this soil in mapping are a few small areas of the redder Cateache soils. Also included are areas of soils that are less than 20 inches deep over bedrock and areas of soils that have slopes of less than 35 percent or more than 55 percent. Included soils make up about 25 percent of the unit.

The available water capacity is low or moderate in the Culleoka soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is strongly acid or moderately acid in the solum and strongly acid in the substratum. The root zone of some types of plants is restricted by the bedrock, which generally is soft, at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. The slope is a severe limitation on log landings, which are needed for equipment accessibility. Erosion is a management concern on the landings. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, American beech, American basswood, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, black birch, American beech, and black locust, and those in the ground cover are mayapple, grasses, ferns, mosses, daisy fleabane, and Queen Anne's lace.

The slope is the main limitation affecting most recreational development in areas of this soil. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails.

This soil has fair potential for woodland wildlife habitat. Some areas support a moderate population of ruffed grouse, red and gray squirrels, and other small game species, and large game species, including black bear, white-tailed deer, and wild turkey.

The slope is the major limitation affecting most urban uses. This soil is not used for urban development.

The capability subclass is VIIe. The woodland ordination symbol is 4R on north and south aspects.

DhC—Dekalb-Hazleton complex, 3 to 15 percent slopes, very stony

This map unit consists of strongly sloping and gently sloping, well drained, moderately deep and deep soils on benches and ridgetops. These soils are on the east and west sides of Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain in areas of the Oriskany geologic deposits. They occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 55 percent

Dekalb soil, 35 percent Hazleton soil, and 10 percent other soils.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Hazleton soil is black channery loam about 1 inch thick. It is underlain by dark brown channery loam about 1 inch thick. The subsoil is about 28 inches thick. The upper 3 inches is dark yellowish brown channery loam, the next 6 inches is yellowish brown channery fine sandy loam, and the lower 19 inches is yellowish brown very channery sandy loam. The substratum is strong brown extremely channery sandy loam. Yellowish brown, massive sandstone bedrock is at a depth of about 50 inches.

Included with these soils in mapping are small areas of the well drained Berks soils. Also included are areas of soils that do not have stones on the surface and areas of soils that have slopes of more than 15 percent.

The available water capacity is very low to moderate in the Dekalb soil and low or moderate in the Hazleton soil. Permeability is rapid in the subsoil of the Dekalb soil and moderately rapid or rapid in the subsoil of the Hazleton soil. Runoff is rapid or medium on both soils. Natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The depth to bedrock ranges from 20 to 40 inches in the Dekalb soil and from 40 to 60 inches in the Hazleton soil.

Most areas of these soils are wooded. Some are used as pasture. The pastured areas are mainly on Browns Mountain.

These soils are not suited to cultivated crops or hay, but they are suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on the Dekalb soil and moderately high on the Hazleton soil. No major limitations affect harvesting. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, installing water bars, and revegetating disturbed areas help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, hickory, eastern white pine, and red maple. The dominant plant communities in the understory are white oak, eastern white pine, witch hazel, flowering dogwood, mountain laurel, huckleberry, rhododendron, and striped maple, and those in the ground cover are teaberry, late low blueberry, deerberry, bellwort, white snakeroot, grasses, ferns, and mosses.

These soils have moderate or severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have fair potential for woodland wildlife habitat. Many areas of these soils provide cover for an abundant population of small and large game species. The potential of these soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

Stones, the depth to bedrock, and the slope are the main limitations affecting urban uses. The stones and the slope are limitations on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock, seepage, and a poor filtering capacity are the main limitations affecting sanitary facilities. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions.

The depth to bedrock and large stones are the main limitations affecting the use of these soils for local roads and streets. Planning roads in areas where soils are deeper to bedrock or have fewer stones on the surface and adding coarser grained subgrade or base material may minimize the effects of the restrictions.

The capability subclass is VIs. The woodland ordination symbol is 3A in areas of the Dekalb soil and 4A in areas of the Hazleton soil.

DhE—Dekalb-Hazleton complex, 15 to 35 percent slopes, very stony

This map unit consists of moderately steep and steep, well drained, moderately deep and deep soils on side slopes, benches, and ridgetops. These soils are on the east and west sides of Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain in areas of the Oriskany geologic deposits. They occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 55 percent Dekalb soil, 35 percent Hazleton soil, and 10 percent other soils.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Hazleton soil is black channery loam about 1 inch thick. It is underlain by dark brown channery loam about 1 inch thick. The subsoil is about 28 inches thick. The upper 3 inches is dark yellowish brown channery loam, the next 6 inches is yellowish brown channery fine sandy loam, and the lower 19 inches is yellowish brown very channery sandy loam. The substratum is strong brown extremely channery sandy loam. Yellowish brown, massive sandstone bedrock is at a depth of about 50 inches.

Included with these soils in mapping are small areas of the well drained Berks and Elliber soils. Also included are areas of soils that do not have stones on the surface and areas of soils that have slopes of less than 15 percent or more than 35 percent.

The available water capacity is very low to moderate in the Dekalb soil and low or moderate in the Hazleton soil. Permeability is rapid in the subsoil of the Dekalb soil and moderately rapid or rapid in the subsoil of the Hazleton soil. Runoff is very rapid or rapid on both soils. Natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The depth to bedrock ranges from 20 to 40 inches in the Dekalb soil and from 40 to 60 inches in the Hazleton soil.

Most areas of these soils are wooded. Some are used as pasture. The pastured areas are mainly on Browns Mountain.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in pastured areas.

The potential productivity for trees is moderately high on the north aspects of the Hazleton soil, moderate on the north aspects of the Dekalb soil, and moderate on the south aspects of both soils. The limitations for operability of logging equipment and the construction of haul roads, skid trails, and log landings are moderate. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, hickory, eastern white pine, and red maple. The dominant plant communities in the understory are white oak, eastern white pine, witch hazel, flowering dogwood, mountain laurel, huckleberry, rhododendron, and striped maple, and those in the ground cover are teaberry, late low blueberry, deerberry, bellwort, white snakeroot, grasses, ferns, and mosses.

These soils have severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have fair potential for woodland wildlife habitat. Many areas of this unit provide cover for an abundant population of small and large game species. The potential of these soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

The slope, the depth to bedrock, and the stones are the main limitations affecting most urban uses. Areas of included soils that are less sloping, deeper to bedrock, and have fewer stones on the surface are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north aspects of the Dekalb soil and 2R on south aspects. It is 4R on north aspects of the Hazleton soil and 3R on south aspects.

DhF—Dekalb-Hazleton complex, 35 to 55 percent slopes, very stony

This map unit consists of very steep, well drained, moderately deep and deep soils on side slopes. These soils are on the east and west sides of Beaver Lick Mountain, Brushy Mountain, Michael Mountain, and Browns Mountain in areas of the Oriskany geologic deposits. They occur as areas so intermingled that it was not practical to map them separately. Stones cover 1 to 3 percent of the surface. The unit is about 55 percent Dekalb soil, 35 percent Hazleton soil, and 10 percent other soils.

Typically, the surface layer of the Dekalb soil is very dark grayish brown channery loam about 4 inches thick. The subsoil is yellowish brown very channery loam about 22 inches thick. The substratum is brownish yellow very channery sandy loam. Hard sandstone bedrock is at a depth of about 36 inches.

Typically, the surface layer of the Hazleton soil is black channery loam about 1 inch thick. It is underlain by dark brown channery loam about 1 inch thick. The subsoil is about 28 inches thick. The upper 3 inches is dark yellowish brown channery loam, the next 6 inches is yellowish brown channery fine sandy loam, and the lower 19 inches is yellowish brown very channery sandy loam. The substratum is strong brown extremely channery sandy loam. Yellowish brown, massive sandstone bedrock is at a depth of about 50 inches.

Included with these soils in mapping are small areas of the well drained Berks and Elliber soils. Also included are areas of soils that do not have stones on the surface and areas of soils that have slopes of less than 35 percent or more than 55 percent.

The available water capacity is very low to moderate in the Dekalb soil and low or moderate in the Hazleton soil. Permeability is rapid in the subsoil of the Dekalb soil and moderately rapid or rapid in the subsoil of the Hazleton soil. Runoff is very rapid on both soils, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The depth to bedrock ranges from 20 to 40 inches in the Dekalb soil and from 40 to 60 inches in the Hazleton soil.

Most areas of these soils are wooded. Some are used as pasture. The pastured areas are mainly on Browns Mountain.

These soils are not suited to cultivated crops or hay and are difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on the north aspects of the Hazleton soil, moderate on the north aspects of the Dekalb soil, and moderate on the south aspects of both soils. The limitations for operability of logging equipment and the construction of haul roads, skid trails, and log landings are moderate. Roads should not be used during wet periods. If roads must be used when the soils are wet, adding gravel to the surface minimizes the formation of ruts. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, white oak, chestnut oak, hickory, eastern white pine, and red maple. The dominant plant communities in the understory are white oak, eastern white pine, witch hazel, flowering dogwood, mountain laurel, huckleberry, rhododendron, and striped maple, and those in the ground cover are teaberry, late low blueberry, deerberry, bellwort, white snakeroot, grasses, ferns, and mosses.

These soils have severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

These soils have fair potential for woodland wildlife habitat. Many areas of this unit provide cover for an abundant population of small and large game species. The potential of these soils for wildlife habitat can be improved by constructing waterholes; seeding abandoned haul roads, skid trails, and landings; and creating openings in the overstory to promote the growth of ground vegetation.

The slope, the depth to bedrock, and the stones are the main limitations affecting most urban uses. Because of these limitations, these soils are not used for urban development. Areas of included soils that are less sloping, deeper to bedrock, and have fewer stones on the surface are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 3R on north aspects of the Dekalb soil and 2R on south aspects. It is 4R on north aspects of the Hazleton soil and 3R on south aspects.

DuB—Duffield silt loam, 3 to 8 percent slopes

This soil is deep, gently sloping, and well drained. It is on limestone uplands, from Beard Heights south to the county line. Sinkholes are in some areas.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is 38 inches thick. The upper 9 inches is yellowish brown silty clay loam, the next 20 inches is strong brown silty clay that has light gray lithochromic mottles, and the lower 9 inches is strong brown channery silty clay that has yellowish red, brownish yellow, and light gray lithochromic mottles. Highly weathered, pale olive, brownish yellow, and dark reddish brown siltstone bedrock is at a depth of about 46 inches.

Included with this soil in mapping are a few small areas of the very deep Lodi and Shouns soils, the moderately well drained Sees soils along drainageways and in depressions, and soils that have slopes of more than 8 percent. Also included are some areas of soils that have more clay in the subsoil than the Duffield soil or a layer in the subsoil that is firm and brittle. Included soils make up about 25 percent of the unit.

The available water capacity is high in the Duffield soil. Permeability is moderate in the subsoil. Runoff and natural fertility are medium. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is 40 to 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Only a few small areas are wooded. The wooded areas generally are grazed woodlots on farms. They are 5 to 10 acres in size.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on this soil. Selecting planting stock that has a well developed root system and timing planting to take full advantage of spring rains help to control plant competition and to ensure the successful establishment of tree plantations.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, black locust, and red maple. The dominant plant communities in the understory are rhododendron and mountain laurel, and those in the ground cover are grasses and mosses.

Few restrictive features affect the development of camp areas, picnic areas, and paths and trails. The slope and small stones are limitations affecting the development of playgrounds. Choosing the most level areas of the soil and land shaping help to overcome the slope. Removing the stones minimizes their effect on recreational development.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds.

The shrink-swell potential of this soil is a limitation on sites for dwellings. Installing properly designed footers, diverting surface water away from foundations, and backfilling with porous material minimize the damage caused by shrinking and swelling. The depth to bedrock is an additional limitation on sites for dwellings with basements. Choosing the deepest areas of the soil, building above the bedrock, and adding fill material when landscaping minimize the effects of the restrictions caused by the limited depth to bedrock.

The depth to bedrock is a limitation on sites for septic tank absorption fields. Installing a larger filter field and choosing the deepest areas of the soil help to overcome this limitation.

Low strength is a limitation on sites for local roads and streets. Adding suitable subgrade or base material minimizes the damage caused by low strength.

Erosion is a moderate hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 4A.

DuC—Duffield silt loam, 8 to 15 percent slopes

This soil is deep, strongly sloping, and well drained. It is on limestone uplands, from Beard Heights south to the county line. Sinkholes are in some areas.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is 38 inches thick. The upper 9 inches is yellowish brown silty clay loam, the next 20 inches is strong brown silty clay that has light gray lithochromic mottles, and the lower 9 inches is strong brown channery silty clay that has yellowish red, brownish yellow, and light gray lithochromic mottles. Highly weathered, pale olive, brownish yellow, and dark reddish brown siltstone bedrock is at a depth of about 46 inches.

Included with this soil in mapping are areas of the very deep Lodi soils, the moderately deep Cateache soils, and soils that have slopes of less than 15 percent or more than 25 percent. Also included are some areas of soils that have more clay in the subsoil than the Duffield soil or a layer in the subsoil that is firm and brittle. Included soils make up about 25 percent of the unit.

The available water capacity is high in the Duffield soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is medium. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is 40 to 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Only a few small areas are wooded. The wooded areas generally are grazed woodlots on farms. They are 5 to 10 acres in size.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on this soil. Controlling competing vegetation, selecting planting stock that has a well developed root system, and timing planting to take full advantage of spring rains help to control plant competition and to ensure the successful establishment of tree plantations.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, black locust, and red maple. The dominant plant communities in the understory are rhododendron and mountain laurel, and those in the ground cover are grasses and mosses.

Few restrictive features affect the development of paths and trails. The slope is the major limitation affecting the use of this soil for other recreational development. Choosing the most level areas, land shaping, and designing facilities so that they conform to the natural slope of the land help to overcome the slope.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds.

A shrink-swell potential and the slope are the main limitations on sites for dwellings. Installing properly designed footers, diverting surface water away from foundations, and backfilling with porous material minimize the damage caused by shrinking and swelling. The slope can be overcome by designing dwellings so that they conform to the natural slope of the land and by land shaping. The depth to bedrock is an additional limitation on sites for dwellings with basements. It can be minimized by choosing the deepest areas of the soil, building above the bedrock, and adding fill material when landscaping.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. These limitations can be minimized by choosing the deepest areas of the soil; enlarging the size of the filter field; digging wide, deep trenches under the distribution lines; and laying out the filter field on the contour.

Low strength is a limitation on sites for local roads and streets. Providing suitable subgrade or base material minimizes the damage caused by low strength. The slope is an additional limitation in areas of included soils that have slopes of 15 to 25 percent.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

ElF—Elliber extremely channery silt loam, 35 to 55 percent slopes

This soil is very deep, very steep, and well drained. It is typically on side slopes in the eastern half of the county.

Typically, the surface layer is very dark grayish brown extremely channery silt loam about 2 inches thick. The subsoil is about 63 inches thick. It is yellowish brown. The upper 3 inches of the subsoil is extremely channery silt loam, the next 5 inches is very channery loam, the next 13 inches is extremely channery loam, the next 7 inches is very channery loam, the next 5 inches is very channery silt loam, the next 13 inches is very channery loam, and the lower 17 inches is very channery clay loam. The lower 35 inches of the subsoil has an accumulation of clay.

Included with this soil in mapping are areas of the moderately deep Dekalb soils on ridges, the very deep Mertz soils on foot slopes, and the deep Hazleton soils on the lower side slopes. Also included are areas of soils that have slopes of less than 35 percent or more than 55 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Elliber soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low or medium. In unlimed areas reaction is extremely acid to strongly acid. Bedrock is at a depth of more than 60 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north and south aspects of this soil. Low natural fertility and droughtiness are the main limitations. Plant competition is an additional concern, especially on south aspects. Harvest methods that do not remove all of the overstory minimize plant competition. The slope is the major limitation affecting most logging operations. It restricts the use of wheeled and tracked equipment in skidding operations when timber is harvested. Haul roads, skid trails, and log landings are needed for equipment accessibility. Erosion is a major management concern in these areas. It also is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Logging roads constructed in areas of this soil are of high quality because of the availability of chert fragments as a base. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage of roads and trials to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, red maple, hickory, eastern white pine, chestnut oak, eastern hemlock, and pitch pine. The dominant plant communities in the understory are mountain laurel, eastern white pine, flowering dogwood, witch hazel, common serviceberry, and red maple, and those in the ground cover are teaberry, black huckleberry, late low blueberry, mosses, minnie-bush, and grasses.

The slope and small stones are the main limitations affecting recreational development in areas of this soil. Laying out hiking trails on a gentle grade across the slope helps to overcome the slope and control surface runoff.

This soil has good potential for woodland wildlife habitat. Areas of this soil support an abundance of woodland game species, such as black bear, white-tailed deer, gray squirrel, wild turkey, and ruffed grouse, as well as nongame species, such as pileated woodpeckers, reptiles, and various songbirds, especially in the area of Calvin Price State Forest.

The slope is the major limitation affecting most urban uses. This soil is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 5R on north aspects and 4R on south aspects.

FaC—Faywood silt loam, 3 to 15 percent slopes, very rocky

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically in the uplands on Browns and Michael Mountains and in the area south of Green Bank. About 2 to 10 percent of the surface is exposed bedrock. Sinkholes are common in some areas.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is about 16 inches thick. The upper 3 inches is yellowish brown silt loam, and the lower 13 inches is strong brown silty clay loam.

The substratum is strong brown clay. Limestone bedrock is at a depth of about 28 inches. In some areas less than 2 percent of the surface is exposed bedrock. In other areas the subsoil is redder.

Included with this soil in mapping are a few small areas of the moderately deep Berks and Dekalb soils and the very deep Blackthorn soils. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, and areas of soils that have slopes of more than 15 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is moderate in the Faywood soil. Permeability is slow or moderately slow in the subsoil. Runoff is rapid or medium, and natural fertility is high. In unlimed areas reaction is slightly acid to slightly alkaline. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The rock outcrop restricts the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some places. In other places enlarging the size of the grazed area helps to overcome the lack of water.

The potential productivity for trees is moderately high on this soil. Plant competition is a management concern. Erosion on roads, skid trails, and log landings and the equipment limitation are the major management concerns. The rock outcrop limits the use of equipment. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, and black locust. The dominant plant communities in the understory are white oak, black locust, hickory, flowering dogwood, witch hazel, and multiflora rose, and those in the ground cover are bloodroot, Indian turnip, grasses, mosses, and thistles.

The slope, the moderately slow or slow permeability, and erosion are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized in camp areas and picnic areas and on playgrounds by selecting less sloping areas as sites and excavating the soil in those sites. Installing diversions or water breaks to help remove surface water and maintaining a vegetative cover reduce the hazard of erosion and minimize the amount of water that flows through the soil.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as mourning dove and ruffed grouse.

The depth to bedrock, the slope, a shrink-swell potential, and the moderately slow or slow permeability are the main limitations affecting urban uses. Areas of included soils that are more than 40 inches deep over bedrock and areas where there is less rock outcrop have fewer restrictive features affecting most urban uses.

The depth to bedrock is the main limitation on sites for dwellings with basements. The slope, the depth to bedrock, and a shrink-swell potential are the main limitations on sites for dwellings without basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the restrictions caused by the slope and the depth to bedrock. Adding extra reinforcement to footings and backfilling with sandy material minimize the damage caused by shrinking and swelling.

The depth to bedrock and the moderately slow or slow permeability are the main limitations on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing a specially designed system or an alternate system may minimize the effects of the restrictions.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is VIs. The woodland ordination symbol is 4A.

FaE—Faywood silt loam, 15 to 35 percent slopes, very rocky

This soil is moderately deep, steep and moderately steep, and well drained. It is typically on uplands in the area of Browns and Michael Mountains and in the area south of Green Bank. About 2 to 10 percent of the surface is exposed bedrock. Sinkholes are common in some areas.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is about 16 inches thick. The upper 3 inches is yellowish brown silt loam, and the lower 13 inches is strong brown silty clay loam. The substratum is strong brown clay. Limestone bedrock is at a depth of about 28 inches. In some areas less than 2 percent of the surface is exposed bedrock. In other areas the subsoil is redder.

Included with this soil in mapping are a few small areas of the moderately deep Berks and Dekalb soils and the very deep Blackthorn soils. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, and areas of soils that have slopes of less than 15 percent or more than 35 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is moderate in the Faywood soil. Permeability is slow or moderately slow in the subsoil. Runoff is very rapid or rapid, and natural fertility is high. In unlimed areas reaction is slightly acid to slightly alkaline. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used as pasture. Some are wooded.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The rock outcrop and the slope restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some places. In other places extending the size of the grazed area helps to overcome the lack of water.

The potential productivity for trees is moderately high on this soil. Plant competition is a management concern. Erosion on roads and skid trails and the equipment limitation are the major management concerns. The slope and the rock outcrop limit the use of equipment. Laying out roads and trails on a gentle grade across the slope and seeding bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, and black locust. The dominant plant communities in the understory are white oak, black locust, hickory, flowering dogwood, witch hazel, and multiflora rose, and those in the ground cover are bloodroot, Indian turnip, grasses, mosses, and thistles.

The slope and erosion are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized in camp areas and picnic areas and on playgrounds by selecting less sloping areas as sites and excavating the soil in those sites. Installing diversions or water breaks to help remove surface water and maintaining a vegetative cover reduce the hazard of erosion.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as mourning dove and ruffed grouse.

The slope, the depth to bedrock, the moderately slow and slow permeability, and a shrink-swell potential are the main limitations affecting most urban uses. Areas of included soils that have slopes of 8 to 15 percent and are deeper to bedrock and areas where there is less rock outcrop have fewer restrictive features affecting most urban uses.

The capability subclass is VIs. The woodland ordination symbol is 4R.

FaF—Faywood silt loam, 35 to 55 percent slopes, very rocky

This soil is moderately deep, very steep, and well drained. It is typically on upland side slopes in the area of Browns and Michael Mountains and in the area south of Green Bank. About 2 to 10 percent of the surface is exposed bedrock.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is about 16 inches thick. The upper 3 inches is yellowish brown silt loam, and the lower 13 inches is strong brown silty clay loam. The substratum is strong brown clay. Limestone bedrock is at a depth of about 28 inches. In some areas less than 2 percent of the surface is exposed. In other areas the subsoil is redder.

Included with this soil in mapping are a few small areas of the moderately deep Berks and Dekalb soils. Also included are areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas where more than 10 percent of the surface is exposed bedrock, areas of soils that have slopes of less than 35 percent or more than 55 percent, and some areas where erosion has removed most of the original surface layer and the subsoil is exposed. Inclusions make up about 25 percent of the unit.

The available water capacity is moderate in the Faywood soil. Permeability is slow or moderately slow in the subsoil. Runoff is very rapid, and natural fertility is high. In unlimed areas reaction is slightly acid to slightly alkaline. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The rock outcrop and the slope restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs or designing pastures so that they include areas where water can be made available helps to overcome the lack of water.

The potential productivity for trees is moderately high on this soil. Plant competition is a management concern. The slope and the rock outcrop affect the use of some types of equipment. Erosion on roads and skid trails is a major management concern. Because of the slope, special equipment or management techniques are needed when timber is harvested. Laying out roads and trails on a gentle grade across the slope and seeding bare areas help to control erosion. Poor logging practices can result in very severe erosion in harvested areas.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, eastern white pine, and black locust. The dominant plant communities in the understory are white oak, black locust, hickory, flowering dogwood, witch hazel, and multiflora rose, and those in the ground cover are bloodroot, Indian turnip, grasses, mosses, and thistles.

The slope and erosion are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized in camp areas and picnic areas and on playgrounds by selecting less sloping areas as sites and excavating the soil in those sites. Installing diversions or water breaks to help remove surface water and maintaining a vegetative cover reduce the hazard of erosion.

This soil has good potential for woodland wildlife habitat. Some areas support a moderate population of large game species, such as black bear, white-tailed deer, and wild turkey, as well as some small game species, such as mourning dove and ruffed grouse.

The slope, the depth to bedrock, the moderately slow or slow permeability, and a shrink-swell potential are the main limitations affecting most urban uses. Included soils that are less sloping and deeper to bedrock are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

GaC—Gauley channery sandy loam, 3 to 15 percent slopes, extremely stony

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically at the higher elevations on convex ridgetops west of the Greenbrier River. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is black channery sandy loam about 2 inches thick. It is overlain by about 3 inches of black, highly decomposed forest litter and underlain by about 4 inches of brown very channery sandy loam. The subsoil is about 14 inches thick. The upper 3 inches is dark reddish brown very channery sandy loam, and the lower 11 inches is strong brown very channery loam. The substratum is yellowish brown extremely channery loam. Massive, olive gray sandstone bedrock is at a depth of about 35 inches.

Included with this soil in mapping are areas of the moderately deep Leatherbark soils on broad, concave flats and the moderately deep Mandy soils. The Mandy soils are not so stony as the Gauley soil. Also included are areas where stones cover more than 15 percent of the surface and areas of soils that have slopes of less than 3 percent. Inclusions make up about 10 percent of the unit.

The available water capacity is very low to moderate in the Gauley soil. Permeability is moderately rapid in the subsoil. Runoff is rapid or medium, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some areas, especially near the head of Shavers Fork of Cheat River, are being developed for urban and recreational uses.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture because of the extreme stoniness and the short growing season. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern.

The potential productivity for red spruce is high on this soil. Seedling mortality and plant competition are hazards. If the timber harvest is planned to take full advantage of the abundant seed supply, the stand will become overstocked with red spruce and the natural thinning process will produce a fully stocked stand of timber. The limitations for construction of haul roads, skid roads, and log landings are moderate. They can be minimized by constructing haul roads and skid roads in areas of soils that are less stony, less sandy, and deeper to bedrock and by constructing log landings in areas of soils are less sloping.

The dominant plant communities in the overstory on this soil are red spruce, yellow birch, red maple, and bigtooth aspen. The dominant plant communities in the understory are red spruce, huckleberry, great rhododendron, mountain ash, mountain holly, mountain laurel, red elderberry, and hobblebush, and those in the ground cover are clubmoss, ground pine, southern mountain cranberry, ferns, and mountain wood sorrell.

This soil has severe limitations affecting most recreational development. Stoniness is the main limitation. The slope is an additional limitation on sites for playgrounds. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

This soil has fair potential for woodland wildlife habitat. Black bear, white-tailed deer, ruffed grouse, and snowshoe hare use areas in this unit for cover after the areas have been clearcut.

The depth to bedrock, the large stones, and the slope are the main limitations affecting urban uses. They are the main limitations on sites for dwellings. Building above the bedrock, adding fill material when landscaping, and designing dwellings so they conform to the natural slope of the land and to the setting minimize the effects of the restrictions. Erosion is a hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The depth to bedrock, the slope, and the large stones are the main limitations on sites for local roads and streets. Constructing roads and streets on a gentle grade across the slope, removing the stones, and providing a coarse textured base material minimize the effects of the restrictions.

The capability subclass is VIIs. The woodland ordination symbol is 6X.

GaE—Gauley channery sandy loam, 15 to 35 percent slopes, extremely stony

This soil is moderately deep, steep and moderately steep, and well drained. It is typically at the higher elevations on convex ridgetops and shoulder slopes west of the Greenbrier River. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is black channery sandy loam about 2 inches thick. It is overlain by about 3 inches of black, highly decomposed forest litter and underlain by about 4 inches of brown very channery sandy loam. The subsoil is about 14 inches thick. The upper 3 inches is dark reddish brown very channery sandy loam, and the lower 11 inches is strong brown very channery loam. The substratum is yellowish brown extremely channery loam. Massive, olive gray sandstone bedrock is at a depth of about 35 inches.

Included with this soil in mapping are a few small areas of the moderately deep Mandy and Leatherbark soils. Also included are areas where stones cover more than 15 percent of the surface and areas of soils that have slopes of less than 15 percent. Inclusions make up about 10 percent of the unit.

The available water capacity is very low to moderate in the Gauley soil. Permeability is moderately rapid in the subsoil. Runoff is very rapid or rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some areas, especially near the head of Shavers Fork of Cheat River, are being developed for recreational uses.

This soil is not suited to cultivated crops, hay, or pasture because of the extreme stoniness, the slope, and the short growing season.

The potential productivity for red spruce is high on this soil. Erosion, seedling mortality, and plant competition are hazards. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion. If the timber harvest is planned to take full advantage of the abundant seed supply, the stand will become overstocked with red spruce and the natural thinning process will produce a fully stocked stand of timber. The limitations for construction of haul roads and skid roads are moderate and those for log landings are severe. They can be minimized by constructing haul roads and skid roads in areas of soils that are less sloping, less stony, less sandy, and deeper to bedrock and by constructing log landings in areas of soils are less sloping.

The dominant plant communities in the overstory on this soil are red spruce, yellow birch, red maple, and bigtooth aspen. The dominant plant communities in the understory are red spruce, huckleberry, great rhododendron, mountain ash, mountain holly, mountain laurel, red elderberry, and hobblebush, and those in the ground cover are clubmoss, ground pine, southern mountain cranberry, ferns, and mountain wood sorrell.

This soil has severe limitations affecting most recreational development. Large and small stones and the slope are the main limitations. Trails can be constructed, but they should include structures that help to control surface water and erosion. Revegetating bare areas reduces the hazard of erosion.

This soil has fair potential for woodland wildlife habitat. Black bear, white-tailed deer, ruffed grouse, and snowshoe hare use areas in this unit for cover after the areas have been clearcut.

Because of the slope, the depth to bedrock, and the large stones, this soil it not suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 6R.

Ho—Holly silt loam

This soil is very deep, nearly level, and poorly drained. It is on flood plains throughout the county and is subject to frequent ponding or flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark gray silt loam about 4 inches thick. It has dark brown mottles. The subsoil is about 38 inches thick. The upper 5 inches is dark gray silt loam that has dark yellowish brown and dark brown mottles, the next 2 inches is dark gray sandy loam that has dark gray mottles, the next 4 inches is dark gray silt loam that has dark brown mottles, the next 6 inches is grayish brown silt loam that has dark yellowish brown, yellowish brown, and brown mottles, and the lower 21 inches is light brownish gray silt loam that has dark yellowish brown and brown mottles. The substratum extends to a depth of 65 inches or more. The upper 2 inches is grayish brown sandy loam that has brown mottles, the next 8 inches is gray silt loam that has dark brown and strong brown mottles, the next 2 inches is grayish brown sandy loam that has brown, yellowish brown, and dark brown mottles, and the lower 11 inches is gray silt loam that has yellowish brown mottles.

Included with this soil in mapping are a few small areas of the somewhat poorly drained Orrville soils and soils along the smaller drainageways. The soils along the drainageways have a higher content of rock fragments in the profile than the Holly soil. Included soils make up about 10 percent of the unit.

The available water capacity is high in the Holly soil. Permeability is moderately slow or moderate in the subsoil. Runoff is slow, and natural fertility is medium or high. In unlimed areas reaction is moderately acid or slightly acid in the surface layer and the substratum and strongly acid to slightly acid in the subsoil. The seasonal high water table is within a depth of 1 foot. It restricts the root zone of many types of plants.

Most areas of this soil have been cleared of trees. Most of the acreage is pasture or idle land.

The suitability of this soil for cultivated crops is limited. The soil is better suited to hay or pasture plants that tolerate wetness. The hazard of erosion is slight. The wetness restricts the use of most types of farm machinery. If the soil is cultivated, minimizing tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Proper stocking rates that help to maintain desirable grasses, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil, but only a small acreage is wooded. Logging should be deferred during wet periods until the soil is reasonably firm. Plant competition is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are pin oak, American sycamore, river birch, red maple, and eastern white pine. The dominant plant communities in the understory are brookside alder, eastern white pine, and river birch, and those in the ground cover are Saint Johnswort, skunkcabbage, sedges, reeds, and milkweed.

The wetness and the flooding are severe limitations affecting recreational development in areas of this soil.

This soil has fair potential for openland and woodland wildlife habitat and good potential for wetland wildlife habitat. Leaving small areas of brush helps to provide food and cover for geese, ducks, muskrat, mink, and a variety of songbirds.

The flooding, the wetness, the moderately slow permeability, and the potential for frost action are severe limitations affecting most urban uses.

The capability subclass is IIIw. The woodland ordination symbol is 5W.

LeC—Leatherbark silt loam, 0 to 15 percent slopes, very stony

This soil is moderately deep, nearly level to strongly sloping, and somewhat poorly drained. It is typically at the higher elevations on broad ridgetops and benches west of the Greenbrier River. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown silt loam about 2 inches thick. It is underlain by grayish brown silt loam about 3 inches thick. The subsoil is about 30 inches thick. The upper 4 inches is yellowish brown silty clay loam that has gray and yellowish brown mottles, the next 9 inches is brownish yellow silty clay loam that has brownish yellow and light brownish gray mottles, and the lower 17 inches is light olive brown channery silt loam that has grayish brown, dark yellowish brown, and yellowish brown mottles. The substratum is dark brown very channery silt loam that has gray and yellowish brown mottles. Highly weathered, black, gray, and reddish brown, fractured siltstone and shale bedrock is at a depth of about 38 inches.

Included with this soil in mapping are a few small areas of the well drained Gauley and Mandy soils. Also included are areas of soils that are deeper and have mottles lower in the profile than the Leatherbark soil and areas where stones cover less than 1 percent or more than 3 percent of the surface. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate in the Leatherbark soil. Permeability is moderately slow in the subsoil. Runoff is slow to rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The seasonal high water table at a depth of 6 to 12 inches and bedrock at a depth of 20 to 40 inches restrict the root zone of some types of plants.

Most areas of this soil are wooded. They are in Monongahela National Forest.

This soil is not suited to cultivated crops or hay because of the wetness and the short growing season. It is suited to pasture plants that tolerate the wetness and the short growing season. The hazard of erosion is slight to severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is high on this soil. Plant competition and the wetness are the major management concerns. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Logging should be deferred during wet periods until the soil is reasonably firm. Adding gravel to the surface of main roads minimizes the effects of the wetness.

The dominant plant communities in the overstory on this soil are red spruce, black cherry, American beech, yellow birch, red maple, sugar maple, and eastern hemlock. The dominant plant communities in the understory are red spruce, yellow birch, American beech, huckleberry, great rhododendron, mountain ash, mountain holly, mountain laurel, red elderberry, and hobblebush, and those in the ground cover are clubmoss, ground pine, southern mountain cranberry, ferns, and mountain wood sorrell.

Large stones, the wetness, and the slope are the main limitations affecting recreational development in areas of this soil. Choosing the less sloping areas of the soil, removing the surface stones, and installing a drainage system minimize the effects of the restrictions.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Some areas of woodland support a moderate population of small and large game species, such as ruffed grouse, black bear, white-tailed deer, and wild turkey.

The wetness, the depth to bedrock, the moderately slow permeability, and the potential for frost action are the major limitations affecting urban uses. Areas of the included Mandy soils have fewer limitations affecting urban development.

The capability subclass is VIs. The woodland ordination symbol is 7W.

LlB—Lily loam, 3 to 8 percent slopes

This soil is moderately deep, gently sloping, and well drained. It is on upland flats west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown loam about 1 inch thick. It is underlain by dark grayish brown loam about 1 inch thick. The subsoil is about 30 inches thick. The upper 13 inches is yellowish brown loam, the next 7 inches is strong brown loam, and the lower 10 inches is strong brown channery sandy loam. Highly weathered sandstone bedrock is between depths of 32 and 38 inches. It is shades of gray, white, brown, and red. Hard sandstone bedrock in shades of gray, white, brown, and red is at a depth of about 38 inches.

Included with this soil in mapping are areas of the moderately deep Berks and Dekalb soils, areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas of moderately well drained soils, areas of soils that have slopes of more than 8 percent, and areas where stones cover more than 3 percent of the surface. Also included are areas of soils that are similar to the Lily soil but have a surface layer of silt loam and a subsoil of silt loam or silty clay loam and are underlain by highly weathered sandstone or siltstone bedrock that can be ripped. These soils are mainly north of Beard Heights. Also included are areas of soils that are similar to the Lily soil but are sandy loam or fine sandy loam throughout the subsoil. These soils are mainly in the Droop Mountain area. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate in the Lily soil. Permeability is moderately rapid in the subsoil. Runoff is medium, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas. Providing water for livestock may be difficult in some areas because springs and seeps tend to go dry in the summer and ponds are subject to seepage.

The potential productivity for trees is moderate on this soil. Selecting planting stock that has a well developed root system and timing planting to take full advantage of spring rains help to ensure the successful establishment of tree plantations. Generally, no major limitations affect the use of equipment for logging operations; however, if unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Seeding roads, skid trails, and log landings and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, scarlet oak, eastern white pine, and red maple. The dominant plant communities in the understory are mountain laurel, eastern white pine, sassafras, rhododendron, red maple, American chestnut, flowering dogwood, and azalea, and those in the ground cover are teaberry, groundpine, and grasses.

This soil has slight limitations affecting the development of camp areas, picnic areas, and paths and trails. The slope and the depth to bedrock are limitations affecting the development of playgrounds. Choosing the most level areas, land shaping, and adding fill material minimize these limitations.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds. The wooded areas support moderate populations of white-tailed deer.

The depth to hard sandstone bedrock is the major limitation affecting most urban uses. It is a limitation on sites for dwellings with basements. It is not a problem on sites for dwellings without basements, except in areas where the soil is less than 2 feet deep. Choosing the deepest areas of the soil, building above the bedrock, and adding fill material when landscaping minimize the restrictions caused by the depth to bedrock.

This soil is limited as a site for septic tank absorption fields because of the depth to hard sandstone bedrock. Septic tank absorption fields may not function properly. The effluent may come to the surface, resulting in unhealthy conditions and an unpleasant odor. Choosing an alternate site of deeper soils and installing a larger filter field may help to minimize this limitation.

The depth to hard sandstone bedrock is a limitation affecting the use of this soil for local roads and streets. Blasting may be necessary in some areas. Roads should not be built in areas where excavating the bedrock is necessary.

Erosion is a moderate hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 3A.

LIC—Lily loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is on upland flats, mainly west of the Greenbrier River.

Typically, the surface layer is very dark grayish brown loam about 1 inch thick. It is underlain by dark grayish brown loam about 1 inch thick. The subsoil is about 30 inches thick. The upper 13 inches is yellowish brown loam, the next 7 inches is strong brown loam, and the lower 10 inches is strong brown channery sandy loam. Highly weathered sandstone bedrock is between depths of 32 and 38 inches. It is shades of gray, white, brown, and red. Hard sandstone bedrock in shades of gray, white, brown, and red is at a depth of about 38 inches.

Included with this soil in mapping are areas of the moderately deep Berks and Dekalb soils, areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas of moderately well drained soils, areas of soils that have slopes of less than 8 percent or more than 15 percent, and areas where stones cover more than 3 percent of the surface. Also included are some areas of soils that are similar to the Lily soil but have a surface layer of silt loam and a subsoil of silt loam or silty clay loam and are underlain by highly weathered sandstone or siltstone bedrock that can be ripped. These soils are mainly north of Beard Heights. Also included are some areas of soils that are similar to the Lily soil but are sandy loam or fine sandy loam throughout. These soils are mainly in the Droop Mountain area. Inclusions make up about 20 percent of the unit.

The available water capacity is moderate in the Lily soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used for pasture, hay, or cultivated crops.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas. Providing water for livestock may be difficult in some areas because springs and seeps tend to go dry in the summer and ponds are subject to seepage.

The potential productivity for trees is moderate on this soil. Selecting planting stock that has a well developed root system and timing planting to take full advantage of spring rains help to ensure the successful establishment of tree plantations. Generally, no major limitations affect the use of equipment for logging operations; however, if unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Seeding roads, skid trails, and log landings and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, scarlet oak, eastern white pine, and red maple. The dominant plant communities in the understory are mountain laurel, eastern white pine, sassafras, rhododendron, red maple, American chestnut, flowering dogwood, and azalea, and those in the ground cover are teaberry, groundpine, and grasses.

This soil has slight limitations affecting the development of paths and trails. The slope is a limitation affecting the development of camp areas, picnic areas, and playgrounds. Choosing the most level areas of the soil and land shaping help to overcome the slope.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds. The wooded areas support moderate populations of white-tailed deer.

The depth to hard sandstone bedrock is the major limitation affecting most urban uses. It is a limitation on sites for dwellings with basements. It is not a problem on sites for dwellings without basements, except in areas where the soil is less than 2 feet deep. Choosing the deepest areas of the soil, building above the bedrock, and adding fill material when landscaping minimize the restrictions caused by the limited depth to bedrock. The slope is an additional limitation on sites for dwellings. Designing dwellings so that they conform to the natural slope of the land and land shaping minimize the effects of the slope.

This soil is limited as a site for septic tank absorption fields because of the depth to hard sandstone bedrock. Septic tank absorption fields may not function properly. The effluent may come to the surface, resulting in unhealthy conditions and an unpleasant odor. Choosing the deeper areas of the soil and installing a larger filter field may minimize this limitation.

The depth to hard sandstone bedrock and the slope are limitations on sites for local roads and streets. Blasting may be necessary in some areas. Roads should be constructed on the contour. They should not be built in areas where excavating the bedrock is necessary.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 3A.

LlD—Lily loam, 15 to 25 percent slopes

This soil is moderately deep, moderately steep, and well drained. It is on upland ridges and side slopes, mainly east of the Greenbrier River in Watoga State Park and Calvin Price State Forest.

Typically, the surface layer is very dark grayish brown loam about 1 inch thick. It is underlain by dark grayish brown loam about 1 inch thick. The subsoil is about 30 inches thick. The upper 13 inches is yellowish brown loam, the next 7 inches is strong brown loam, and the lower 10 inches is strong brown channery sandy loam. Highly weathered sandstone bedrock is between depths of 32 and 38 inches. It is shades of gray, white, brown, and red. Hard sandstone bedrock in shades of gray, white, brown, and red is at a depth of about 38 inches.

Included with this soil in mapping are areas of the moderately deep Berks and Dekalb soils, areas of soils that are less than 20 inches deep over bedrock or more than 40 inches deep over bedrock, areas of soils that have slopes of less than 15 percent or more than 25 percent, and areas where stones cover more than 3 percent of the surface. Also included are some areas of soils that are similar to the Lily soil but have a surface layer of silt loam and a subsoil of silt loam or silty clay loam and are underlain by highly weathered sandstone or siltstone bedrock that can be ripped. These soils are mainly north of Beard Heights. Also included are some areas of soils that are similar to the Lily soil but are sandy loam or fine sandy loam throughout the subsoil. These soils are mainly in the Droop Mountain area. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Lily soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Only a few small areas have been cleared of trees and are used as pasture.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, returning crop residue to the soil, and planting a cover crop help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas. Providing water for livestock may be difficult in some areas because springs and seeps tend to go dry in the summer and ponds are subject to seepage.

The potential productivity for trees is moderate on this soil. Selecting planting stock that has a well developed root system and timing planting to take full advantage of spring rains help to ensure the successful establishment of tree plantations. The slope is a limitation affecting logging operations. If unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special low ground pressure equipment when the soil is wet minimizes the damage. Laying out roads and skid trails on a gentle grade across the slope, controlling surface runoff, seeding roads, skid trails, and log landings, and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, scarlet oak, eastern white pine, and red maple. The dominant plant communities in the understory are mountain laurel, eastern white pine, sassafras, rhododendron, red maple, American chestnut, flowering dogwood, and azalea, and those in the ground cover are teaberry, groundpine, and grasses.

The slope is the main limitation affecting recreational development in areas of this soil. Laying out hiking trails on a gentle grade across the slope, land shaping, and choosing less sloping areas minimize the effects of the slope.

This soil has good potential for woodland wildlife habitat. Most areas support moderate populations of white-tailed deer, wild turkey, and gray squirrel.

The depth to hard sandstone bedrock is the major limitation affecting most urban uses. It is a limitation on sites for dwellings with basements. It is not a problem on sites for dwellings without basements, except in areas where the soil is less than 2 feet deep. Choosing the deepest areas of the soil, building above the bedrock, and adding fill material when landscaping minimize the restrictions caused by the limited depth to bedrock. The slope is an additional limitation on sites for dwellings. Designing dwellings so that they conform to the natural slope of the land and land shaping minimize the effects of the slope.

This soil is limited as a site for septic tank absorption fields because of the depth to hard sandstone bedrock and the slope. Septic tank absorption fields may not function properly. The effluent may come to the surface, resulting in unhealthy conditions and an unpleasant odor. Choosing the deeper areas of the soil, installing a larger filter field, and installing the filter field on the contour may minimize this limitation.

The depth to hard sandstone bedrock and the slope are limitations on sites for local roads and streets. Blasting may be necessary in some areas. Roads should be constructed on the contour. They should not be built in areas where excavating the bedrock is necessary.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IVe. The woodland ordination symbol is 3R.

Lo—Lobdell silt loam

This soil is very deep, nearly level, and moderately well drained. It is typically on the flood plains of all the major drainageways in the county, except for those along Deer Creek. It is subject to occasional flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark brown silt loam about 10 inches thick. The subsoil is about 18 inches thick. The upper 9 inches is dark yellowish brown loam, and the lower 9 inches is dark yellowish brown loam that has grayish brown and yellowish brown mottles. The substratum extends to a depth of 65 inches or more. The upper 19 inches is light olive brown sandy loam that has grayish brown and strong brown mottles. The lower 18 inches is yellowish brown very gravelly silt loam that has grayish brown, olive brown, and yellowish brown mottles.

Included with this soil in mapping are small areas of the poorly drained Holly soils, the somewhat poorly drained Orrville soils, the well drained Tioga soils, and the somewhat excessively drained Potomac soils. Also included are areas of soils that are gravelly or cobbly in the surface layer. Included soils make up about 25 percent of the unit.

The available water capacity is high in the Lobdell soil. Permeability is moderate in the subsoil. Runoff is slow, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to neutral in the surface layer and subsoil and moderately acid to neutral in the substratum. The root zone of some types of plants is restricted by the seasonal high water table at a depth of 1.5 to 2.0 feet. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is slight. If the soil is cultivated, minimizing tillage, planting a cover crop, and including grasses and legumes in the cropping sequence help to increase organic matter content and maintain fertility and tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are pasture management concerns. Proper stocking rates, a rotation grazing system, and deferment of grazing in the spring help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil. Plant competition is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Adding gravel to the surface of haul roads, skid roads, and log landings areas helps to increase soil strength.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, river birch, and American sycamore. The dominant plant communities in the understory are eastern white pine, river birch, and rhododendron, and those in the ground cover are grasses.

The flooding and the wetness are the main limitations affecting recreational development in areas of this soil. The flooding is a severe limitation in camp areas. The flooding and the wetness are moderate limitations in picnic areas and on playgrounds.

Installing a drainage system minimizes the damage caused by the wetness.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The flooding is a severe limitation affecting most urban uses in areas of this soil.

The capability subclass is IIw. The woodland ordination symbol is 5A.

LyB—Lodi silt loam, 3 to 8 percent slopes

This soil is very deep, undulating and gently rolling, and well drained. It is on limestone uplands, mainly in areas surrounding Hillsboro know locally as "Little Levels." Sinkholes are in some areas.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 59 inches thick. The upper 15 inches is reddish brown clay, the next 26 inches is yellowish red clay, and the lower 18 inches is yellowish red clay loam.

Included with this soil in mapping are a few small areas of the deep Belmont and Duffield soils, the very deep Shouns soils, and the moderately well drained Sees soils. Also included are areas of soils that have slopes of less than 3 percent or more than 8 percent and some areas of soils that are similar to the Lodi soil but are brown or strong brown, are more acid than the Lodi soil, or are silty clay loam or silty clay throughout. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Lodi soil. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is high. In unlimed areas reaction is very strongly acid or strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops or hay. A few are used as pasture. There is some urban development in the Hillsboro area.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on this soil. Intensive management to keep undesirable plants from competing with planted seedlings helps to ensure the successful establishment of tree plantations.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, black locust, and black walnut. The dominant plant communities in the understory are northern red oak, hickory, and eastern white pine, and those in the ground cover are grasses, mosses, and thistles.

Few limitations affect the development of camp areas, picnic areas, and paths and trails in areas of this soil. The slope and small stones are limitations affecting the development of playgrounds. Choosing the most level areas of the soil and land shaping help to overcome the slope.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada geese, and mourning dove, as well as various songbirds.

A shrink-swell potential and low strength are the main limitations affecting most urban uses. The shrink-swell potential is the main limitation on sites for dwellings. Installing properly designed footers, diverting surface water away from foundations, and backfilling with porous material minimize the damage caused by shrinking and swelling. In places the depth to bedrock is an additional limitation on sites for dwellings with basements. Choosing the deepest areas of the soil minimizes the restrictions caused by the depth to bedrock.

The moderate permeability in the subsoil is a limitation on sites for septic tank absorption fields. Installing a larger filter field and digging wide, deep trenches under the distribution lines help to overcome this limitation.

Low strength is the main limitation on sites for local roads and streets. Providing suitable base material to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

Erosion is a moderate hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIe. The woodland ordination symbol is 5A.

LyC—Lodi silt loam, 8 to 15 percent slopes

This soil is very deep, gently rolling and rolling, and well drained. It is on limestone uplands, mainly in the areas surrounding Hillsboro known locally as "Little Levels." Sinkholes are in some areas.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 59 inches thick. The upper 15 inches is reddish brown clay, the next 26 inches is yellowish red clay, and the lower 18 inches is yellowish red clay loam.

Included with this soil in mapping are a few small areas of the deep Belmont and Duffield soils and the very deep Shouns soils and areas of soils that have slopes of less than 8 percent or more than 15 percent. Also included are some areas of soils that are similar to the Lodi soil but are brown or strong brown, are more acid than the Lodi soil, or are silty clay loam or silty clay throughout. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Lodi soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is high. In unlimed areas reaction is very strongly acid or strongly acid.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. There is some urban development in the Hillsboro area.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas. Supplying water to livestock may be difficult in some areas because of sinkholes and underground channels. Developing springs and building ponds help to overcome these limitations in some areas.

The potential productivity for trees is moderately high on this soil. Controlling competing vegetation, selecting planting stock that has a well developed root system, and timing planting to take full advantage of the spring rains help to control plant competition and to ensure the successful establishment of tree plantations.

The dominant plant communities in the overstory on this soil are northern red oak, hickory, black locust, and black walnut. The dominant plant communities in the understory are northern red oak, hickory, and eastern white pine, and those in the ground cover are grasses, mosses, and thistles.

The slope and erosion are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by choosing areas that are less sloping, land shaping and grading, and designing the facilities so that they conform to the natural slope of the land. Seeding and mulching bare areas help to control erosion.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada geese, and mourning dove, as well as various songbirds.

A shrink-swell potential, the slope, and low strength are the main limitations affecting most urban uses. The slope and the shrink-swell potential are the main limitations on sites for dwellings. Designing dwellings so that they conform to the natural slope of the land and to the setting minimizes the effects of the slope. Installing properly designed footers, diverting surface water away from foundations, and backfilling with porous material minimize the damage caused by shrinking and swelling. In places the depth to bedrock is an additional limitation on sites for dwellings with basements. Choosing the deepest areas of the soil minimizes the restrictions caused by the depth to bedrock.

The slope and, in some areas, the depth to bedrock are limitations on sites for septic tank absorption fields. The effects of these limitations can be minimized by enlarging the size of the filter field; digging wide, deep trenches under the distribution lines; installing the filter field on the contour; and choosing the deepest areas of the soil.

Low strength is the main limitation on sites for local roads and streets. Providing suitable base material to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

Erosion is a severe hazard in areas cleared for construction. Planning carefully so that only a minimal amount of the soil surface is disturbed and revegetating during or soon after construction reduce the hazard of erosion. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIe. The woodland ordination symbol is 5A.

MaB—Macove channery silt loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and well drained. It is typically on foot slopes, benches, and alluvial fans in the eastern half of the county.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by brown channery loam about 3 inches thick. The subsoil is about 61 inches thick. The upper 3 inches is yellowish brown channery silt loam, the next 7 inches is yellowish brown very channery silt loam, the next 9 inches is yellowish brown very channery silty clay loam, the next 14 inches is strong brown very channery silty clay loam, and the lower 28 inches is brown extremely channery silty clay loam.

Included with this soil in mapping are a few small areas of the very deep Allegheny soils, the moderately deep Berks soils, and the shallow Weikert soils. Also included are areas of soils that are moderately well drained and areas of soils that have slopes of more than 8 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Macove soil. Permeability is moderately rapid in the subsoil. Runoff is medium, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid or strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are white oak, Virginia pine, eastern white pine, red maple, eastern hemlock, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, hawthorn, mountain laurel, flowering dogwood, and rhododendron, and those in the ground cover are grasses, ferns, mosses, and teaberry.

The major limitation affecting recreational uses, such as camp areas, picnic areas, and playgrounds, is the stoniness. The small stones should be removed or covered with fill material that is free of stones.

This soil has good potential for openland wildlife habitat and fair potential for woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The stoniness is the main limitation affecting most urban uses. Areas of the included Allegheny soils have fewer restrictive features affecting most urban uses.

The stoniness is the main limitation on sites for dwellings. Using suitable equipment when excavating minimizes the effects of the large stones.

The stoniness is a limitation on sites for septic tank absorption fields. Backfilling the trench with material that has a lower content of stones minimizes the chance of the distribution lines being crushed by the large stones.

The stoniness is a limitation on sites for local roads and streets. Removing as many of the large stones as possible minimizes this restrictive feature.

The capability subclass is IIe. The woodland ordination symbol is 4A.

MaC—Macove channery silt loam, 8 to 15 percent slopes

This soil is very deep, strongly sloping, and well drained. It is typically on foot slopes, benches, and alluvial fans in the eastern half of the county.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by brown channery loam about 3 inches thick. The subsoil is about 61 inches thick. The upper 3 inches is yellowish brown channery silt loam, the next 7 inches is yellowish brown very channery silt loam, the next 9 inches is yellowish brown very channery silty clay loam, the next 14 inches is strong brown very channery silty clay loam, and the lower 28 inches is brown extremely channery silty clay loam.

Included with this soil in mapping are a few small areas of the very deep Allegheny soils, the moderately deep Berks soils, and the shallow Weikert soils. Also included are areas of soils that are moderately well drained and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 15 percent of the unit.

The available water capacity is moderate in the Macove soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid or strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay or pasture. A few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are white oak, Virginia pine, eastern white pine, red maple, eastern hemlock, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, hawthorn, mountain laurel, flowering dogwood, and rhododendron, and those in the ground cover are grasses, ferns, mosses, and teaberry.

The slope and small stones are the main limitations affecting camp areas, picnic areas, and playgrounds. The stones should be removed or covered with fill material that is free of stones. The effects of the slope can be minimized by selecting less sloping areas as sites and excavating the soil in those sites. Seeding bare areas following construction reduces the hazard of erosion.

This soil has good potential for openland wildlife habitat and fair potential for woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The stoniness is the major limitation affecting most urban uses. Areas of the included Allegheny soils and areas of included soils that are less sloping have fewer restrictive features affecting most urban uses.

The stoniness is the main limitation on sites for dwellings. Using suitable equipment when excavating minimizes the effects of the large stones.

The stoniness is a limitation on sites for septic tank absorption fields. Backfilling the trench with material that has a lower content of stones minimizes the chance of the distribution lines being crushed by the large stones.

The stoniness is a limitation on sites for local roads and streets. Removing as many of the large stones as possible minimizes this restrictive feature.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

MaD—Macove channery silt loam, 15 to 25 percent slopes

This soil is very deep, moderately steep, and well drained. It is typically on foot slopes, benches, and alluvial fans in the eastern half of the county.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by brown channery loam about 3 inches thick. The subsoil is about 61 inches thick. The upper 3 inches is yellowish brown channery silt loam, the next 7 inches is yellowish brown very channery silt loam, the next 9 inches is yellowish brown very channery silty clay loam, the next 14 inches is strong brown very channery silty clay loam, and the lower 28 inches is brown extremely channery silty clay loam.

Included with this soil in mapping are a few small areas of the moderately deep Berks soils and the shallow Weikert soils. Also included are areas of soils that are moderately well drained and areas of soils that have slopes of less than 15 percent or more than 25 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate in the Macove soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid or strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay or pasture. A few areas are used for cultivated crops or woodland.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. Erosion is a management concern when timber is harvested. The limitations for operability of logging equipment and for the construction of haul roads and skid roads are moderate. The limitations for construction of landings are severe. The slope is the major management concern. It can be minimized during the construction of haul roads, skid roads, and landings. Where possible, landings should be constructed in less sloping areas of included soils. Roads should not be used during wet periods. Adding gravel to the surface minimizes the formation of ruts and helps to increase soil strength. Planting filter strips along streams, controlling surface runoff on roads and landings by installing dips, ditches, and water bars, seeding bare areas, and constructing haul roads and skid roads on a gentle grade across the slope help to control erosion.

The dominant plant communities in the overstory on this soil are white oak, Virginia pine, eastern white pine, red maple, eastern hemlock, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, hawthorn, mountain laurel, flowering dogwood, and rhododendron, and those in the ground cover are grasses, ferns, mosses, and teaberry.

This soil has severe limitations affecting camp areas, picnic areas, and playgrounds. Erosion is a management concern. The main limitation is the slope. Excavation is necessary to create level areas used as sites for camping, picnicking, and access roads. Standard septic tank absorption fields may not function properly. An alternate system or a self-contained system, such as sealed vault toilets, possibly could be installed in the less sloping areas of the soil. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. Seeding bare areas following construction reduces the hazard of erosion. The soil has moderate limitations on sites for hiking trails. The slope is the main limitation. Trails should be constructed on a gentle grade across the slope. Water bars help to control surface runoff and erosion.

This soil has fair potential for openland and woodland wildlife habitat. Leaving small areas of hay unharvested along fence rows, field margins, and farm ponds provides food and cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The slope and large stones are the main limitations affecting most urban uses. Areas of included soils that are less sloping have few restrictive features affecting most urban uses.

The slope and the large stones are the main limitations on sites for dwellings. The effects of the slope can be minimized by designing the dwellings so that they conform to the natural slope of the land and by land shaping. Using suitable equipment when excavating minimizes the effects of the stones.

The slope and the large stones are limitations on sites for septic tank absorption fields. The effects of the slope can be minimized by land shaping, installing the distribution lines across the slope, or installing the distribution lines in areas of included soils that are less sloping. The trench should be backfilled with material that contains few large stones.

The slope and the large stones are the main limitations on sites for local roads and streets. The effects of these limitations can be minimized by constructing the roads and streets on the contour, land shaping and grading, adapting the design of the roads and streets to the slope, and removing the large stones.

The capability subclass is IVe. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

McC—Macove channery silt loam, 3 to 15 percent slopes, very stony

This soil is very deep, strongly sloping and gently sloping, and well drained. It is typically on foot slopes, benches, and alluvial fans in the eastern half of the county. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by brown channery loam about 3 inches thick. The subsoil is about 61 inches thick. The upper 3 inches is yellowish brown channery silt loam, the next 7 inches is yellowish brown very channery silt loam, the next 9 inches is yellowish brown very channery silty clay loam, the next 14 inches is strong brown very channery silty clay loam, and the lower 28 inches is brown extremely channery silty clay loam.

Included with this soil in mapping are a few small areas of the very deep Allegheny soils, the moderately deep Berks soils, and the shallow Weikert soils. Also included are areas of soils that are moderately well drained, areas of soils that have slopes of more than 15 percent, and areas where stones cover less than 1 percent or more than 3 percent of the surface. Inclusions make up about 20 percent of the unit.

The available water capacity of this Macove soil is moderate. Permeability is moderately rapid in the subsoil. Runoff is rapid or medium, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid or strongly acid.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are white oak, Virginia pine, eastern white pine, red maple, eastern hemlock, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, hawthorn, mountain laurel, flowering dogwood, and rhododendron, and those in the ground cover are grasses, ferns, mosses, and teaberry.

This soil has severe limitations affecting most recreational development. Small stones are a management concern in camp areas and picnic areas and on paths and trails. Large stones and the slope are management concerns in areas used as playgrounds. The stones should be removed or covered with fill material. Land shaping and grading, locating the facilities in the less sloping areas, and designing the facilities so that they conform to the natural slope of the land minimize the effects of the slope. Installing water-control structures and revegetating bare areas help to control surface runoff and erosion.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Some areas of woodland support a moderate population of ruffed grouse, red and gray squirrels, and other small game and nongame species, and large game species, including black bear, white-tailed deer, and wild turkey. The open areas provide forage for many species.

The slope, the potential for frost action, and the large stones are the main limitations affecting most urban uses. Areas of the included Allegheny soils and areas of included soils that are less sloping and that have fewer stones on the surface have fewer restrictive features affecting urban development.

The slope and the large stones are the main limitations on sites for dwellings. The effects of the slope can be minimized by designing the dwellings so that they conform to the natural slope of the land and by land shaping. Using suitable equipment when excavating minimizes the effects of the large stones.

The slope and the large stones are limitations on sites for septic tank absorption fields. The effects of the slope can be minimized by land shaping, installing the distribution lines across the slope, or installing the distribution lines in areas of included soils that are less sloping. The trench should be backfilled with material that contains few large stones.

The slope, the potential for frost action, and the large stones are the main limitations on sites for local roads and streets. The effects of these limitations can be minimized by constructing the roads and streets on the contour, land shaping and grading, adapting the design of the roads and streets to the slope, adding coarse grained subgrade or base material to frost depth, and removing the large stones.

The capability subclass is VIs. The woodland ordination symbol is 4A.

McE—Macove channery silt loam, 15 to 35 percent slopes, very stony

This soil is very deep, steep and moderately steep, and well drained. It is typically on foot slopes, benches, and alluvial fans in the eastern half of the county. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by brown channery loam about 3 inches thick. The subsoil is about 61 inches thick. The upper 3 inches is yellowish brown channery silt loam, the next 7 inches is yellowish brown very channery silt loam, the next 9 inches is yellowish brown very channery silty clay loam, the next 14 inches is strong brown very channery silty clay loam, and the lower 28 inches is brown extremely channery silty clay loam.

Included with this soil in mapping are a few small areas of the moderately deep Berks soils and the shallow Weikert soils. Also included are areas of soils that are moderately well drained, areas of soils that have slopes of less than 15 percent or more than 35 percent, and areas where stones cover less than 1 percent or more than 3 percent of the surface. Inclusions make up about 25 percent of the unit.

The available water capacity is moderate in the Macove soil. Permeability is moderately rapid in the subsoil. Runoff is very rapid or rapid, and natural fertility is low or medium. In unlimed areas reaction is very strongly acid or strongly acid.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. Erosion on roads, skid trails, and log landings, plant competition on north aspects, and seedling mortality on south aspects are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Planting larger stock or containerized seedlings early in the year to take advantage of spring rains reduces the seedling mortality rate. The slope and low strength are limitations affecting haul roads and skid roads. The slope also is a limitation affecting log landings and equipment operability in logging areas. Locating roads, skid trails, and landings in the less sloping areas of included soils and adding gravel to the surface of haul roads and skid roads help to overcome these limitations.

The dominant plant communities in the overstory on this soil are white oak, Virginia pine, eastern white pine, red maple, eastern hemlock, and hickory. The dominant plant communities in the understory are eastern hemlock, witch hazel, hawthorn, mountain laurel, flowering dogwood, and rhododendron, and those in the ground cover are grasses, ferns, mosses, and teaberry.

This soil has severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations. The effects of the slope can be minimized by land shaping and grading, locating facilities in the less sloping areas, and designing facilities so that they conform to the natural slope of the land. The stones should be removed or covered with fill material. Installing water-control structures and revegetating bare areas help to control surface runoff and erosion.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Some areas of woodland support a moderate population of ruffed grouse, red and gray squirrels, and other small game and nongame species, and large game species, including black bear, white-tailed deer, and wild turkey. The open areas provide forage for many species.

The slope and large stones are the main limitations affecting urban uses. This soil generally is not used for urban development. Areas of included soils that are less sloping and have fewer stones on the surface are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

MdC—Mandy channery silt loam, 8 to 15 percent slopes

This soil is moderately deep, strongly sloping, and well drained. It is mainly on ridgetops and broad benches near the head of the East and West Forks of the Greenbrier River and on Allegheny Mountain. It is at the higher elevations where the average annual precipitation is relatively high and temperatures are cool.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of the very deep Trussel soils. Also included are a few small areas of stony soils, areas of soils that have slopes of less than 8 percent or more than 15 percent, and areas of soils that have a redder subsoil than that of the Mandy soil. Included soils make up about 10 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for hay or pasture. Some are in woodland or are reverting to woodland.

This soil is suited to hay and pasture. Cultivated crops generally do not have sufficient time to mature because the growing season is too short. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is used for hay or pasture, the grass species selected for planting should be those that can tolerate the short growing season. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is moderate if openings are made in the canopy. Harvest methods that do not remove all of the overstory reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. Some trees are uprooted during heavy snowfall. Past windthrow is very evident (fig. 5). Periodic salvaging of windthrown trees may be necessary in some areas. Unsurfaced roads are soft when the soil is wet. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Adding extra stone during road construction may be necessary to help maintain a stable, uniform surface. Special low ground pressure equipment minimizes damage to the soil. Erosion on logging roads, skid trails, and landings is a management concern. Roadcuts and fill slopes are somewhat

Figure 5.—A cleared area of Mandy channery silt loam, 8 to 15 percent slopes. The microrelief was caused by windthrow.

erodible. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, and seeding roads, trails, and landings also help to control erosion.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

The slope and small stones are the main limitations affecting recreational development in areas of this soil. The effects of these limitations can be minimized by selecting areas of the included soils that are less sloping and that have fewer rock fragments on the surface. Laying out paths and trails on a gentle grade across the slope also minimizes the effects of the slope.

This soil has poor potential for woodland wildlife habitat and fair potential for openland wildlife habitat. The areas of woodland support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse. The open areas provide food, such as grasses and insects, for some species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. The slope is a moderate limitation on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. In most places, the bedrock is soft enough to be excavated with conventional earth moving equipment. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the settings minimize the effects of the restrictions. Controlling surface runoff and revegetating bare areas as soon as possible in construction areas help to control erosion. Selecting areas of the included soils that are less sloping as building sites minimizes the effects of the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. Installing distribution lines across the slope allows for more even distribution of effluent. Installing an alternate system minimizes the restrictions caused by the limited depth to bedrock. Selecting the less sloping areas within the map unit as sites for absorption fields minimizes the effects of the slope.

The slope is the main limitation on sites for local roads and streets. The effects of the slope can be minimized by laying out the roads and streets on a gentle grade across the slope.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

MdD—Mandy channery silt loam, 15 to 25 percent slopes

This soil is moderately deep, moderately steep, and well drained. It is mainly on ridgetops and benches near the head of the East and West Forks of the Greenbrier River and on Allegheny Mountain. It is at the higher elevations where the average annual precipitation is relatively high and temperatures are cool.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of the very deep Trussel soils. Also included are a few small areas of stony soils, areas of soils that have slopes of less than 15 percent or more than 25 percent, and areas of soils that have a redder subsoil than that of the Mandy soil. Included soils make up about 15 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for hay or pasture. Some are in woodland or are reverting to woodland.

This soil is suited to hay and pasture. Cultivated crops generally do not have sufficient time to mature because the growing season is too short. The hazard of erosion is severe in unprotected areas. It is a management concern. If the soil is used for hay or pasture, the grass species selected for planting should be those that can tolerate the short growing season. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is moderate if openings are made in the canopy. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. Some trees are uprooted during heavy snowfall. Past windthrow is very evident. Periodic salvaging of windthrown trees may be necessary in some areas. Unsurfaced roads are soft when the soil is wet. Operating wheeled and tracked equipment when the soil is wet results in excessive rutting. Adding extra stone during road construction may be necessary to help maintain a stable, uniform surface. Special low ground pressure equipment minimizes damage to the soil. Erosion on logging roads, skid trails, and landings is a management concern. Roadcuts and fill slopes are somewhat erodible. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, and seeding roads, trails, and landings also help to control erosion.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

The slope is the main limitation affecting most recreational development in areas of this soil. Laying out paths and trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails.

This soil has poor potential for woodland wildlife habitat and fair potential for openland wildlife habitat. The wooded areas support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse. The open areas provide food, such as grasses and insects, for some species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. The slope is a moderate limitation on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. In most areas the bedrock is soft enough to be excavated with conventional earth moving equipment. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the restrictions caused by the slope and the depth to bedrock. Controlling surface runoff and revegetating bare areas as soon as possible in construction areas help to control erosion. Selecting areas of the included soils that are less sloping as building sites minimizes the effects of the slope.

The depth to bedrock and the slope are the main limitations on sites for septic tank absorption fields. Installing distribution lines across the slope allows for more even distribution of effluent. Installing an alternate system minimizes the restrictions caused by the limited depth to bedrock. Selecting the less sloping areas within the map unit as sites for absorption fields minimizes the effects of the slope.

The slope is the main limitation on sites for local roads and streets. The effects of the slope can be minimized by laying out the roads and streets on a gentle grade across the slope.

The capability subclass is IVe. The woodland ordination symbol is 4R.

MfC—Mandy channery silt loam, 3 to 15 percent slopes, very stony

This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is typically near the head of the East and West Forks of the Greenbrier River, on the higher elevations of Back Allegheny Mountain, and in the Cranberry Wilderness area, mainly on convex ridgetops and broad benches. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of the moderately deep Gauley soils and the very deep Snowdog and Trussel soils. Also included are areas where stones cover less than 1 percent of the surface, areas of soils that have less than 15 percent rock fragments in the surface layer, and areas of soils that have slopes of more than 15 percent. Inclusions make up about 15 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is medium or rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some areas, especially near the head of the East Fork of the Greenbrier River, have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings is a major management concern. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Windthrow and plant competition are hazards. Past windthrow is very evident. Periodic salvaging of windthrown trees may be necessary in some areas. Regeneration cuts that leave isolated single trees or groups of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

Small and large stones, the slope, and the depth to bedrock are the main limitations affecting recreational development in areas of this soil. The effects of these restrictive features can be minimized by selecting areas of the included soils that are less sloping and have fewer rock fragments on the surface. Laying out paths and trails on a gentle grade across the slope also minimizes the effects of the slope.

This soil has poor potential for woodland and openland wildlife habitat. The wooded areas support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse. The open areas provide food, such as grasses and insects, for some species.

Stones, the depth to bedrock, and the slope are the main limitations affecting urban uses. Areas of included soils that are deeper to bedrock and have fewer stones on the surface are better suited to urban development.

The stones and the slope are the main limitations on sites for dwellings. The depth to bedrock is an additional limitation on sites for dwellings with basements. Building above the bedrock, adding fill material when landscaping, and designing dwellings so they conform to the natural slope of the land and to the setting minimize the effects of the restrictions. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the restrictions caused by the depth to bedrock.

The stones and the slope are the main limitations on sites for local roads and streets. Constructing roads and streets on a gentle grade across the slope and removing the stones minimize the effects of the restrictions.

The capability subclass is VIs. The woodland ordination symbol is 4A.

MfE—Mandy channery silt loam, 15 to 35 percent slopes, very stony

This soil is moderately deep, moderately steep and steep, and well drained. It is typically near the head of the East and West Forks of the Greenbrier River, on the higher elevations of Back Allegheny Mountain, and in the Cranberry Wilderness area, mainly on side slopes and benches. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of the very deep Snowdog and Trussel soils. Also included are areas of soils having sandier textures than those of the Mandy soil, areas where stones cover less than 1 percent of the surface, areas of soils that have less than 15 percent rock fragments in the surface layer, and areas of soils that have slopes of less than 15 percent or more than 35 percent. Inclusions make up about 20 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is rapid or very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some areas, especially near the head of the East Fork of the Greenbrier River, have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads and skid trails is a major management concern. Windthrow and plant competition are hazards. Past windthrow is very evident. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Periodic salvaging of windthrown trees may be necessary in some areas. Regeneration cuts that leave isolated single trees or groups of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

Small and large stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of these restrictive features can be minimized by selecting areas of the included soils that are less sloping and have fewer rock fragments on the surface. Laying out paths and trails on a gentle grade across the slope also minimizes the effects of the slope.

This soil has poor potential for woodland and openland wildlife habitat. The wooded areas support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse. The open areas provide food, such as grasses and insects, for some species.

The stones, the depth to bedrock, and the slope are the main limitations affecting most urban uses. This soil generally is not used for urban development. The included soils that are less sloping and deeper to bedrock are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

MfF—Mandy channery silt loam, 35 to 55 percent slopes, very stony

This soil is moderately deep, very steep, and well drained. It is typically on side slopes near the head of the East and West Forks of the Greenbrier River, on the higher elevations of Back Allegheny Mountain, and in the Cranberry Wilderness area. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of the very deep Snowdog soils. Also included are areas of soils having sandier textures than those of the Mandy soil, areas where stones cover less than 1 percent of the surface, areas of soils that have less than 15 percent rock fragments in the surface layer, and areas of soils that have slopes of less than 35 percent or more than 55 percent. Inclusions make up about 20 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded. Some areas, especially near the head of the East Fork of the Greenbrier River, have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. The slope limits the use of certain types of logging equipment. Erosion on roads and skid trails is a major management concern. Windthrow and plant competition are hazards. Because of the slope, special equipment and management techniques are needed when timber is harvested. Laying out roads and skid trails on a gentle grade across the slope and seeding these areas help to control erosion. Past windthrow is very evident. Periodic salvaging of windthrown trees may be necessary in some areas. Regeneration cuts that leave isolated single trees or groups of trees are not recommended. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

Small and large stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of these restrictive features can be minimized by selecting areas of the included soils that are less sloping and have fewer rock fragments on the surface. Laying out paths and trails on a gentle grade across the slope also minimizes the effects of the slope.

This soil has poor potential for woodland and openland wildlife habitat. The wooded areas support some large and small game species, such as black bear, white-tailed deer, wild turkey, and ruffed grouse. The open areas provide food, such as grasses and insects, for some species.

The stones, the depth to bedrock, and the slope are the main limitations affecting most urban uses. This soil generally is not used for urban development. The included soils that are less sloping and deeper to bedrock are better suited to urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

MfG—Mandy channery silt loam, 55 to 80 percent slopes, very stony

This soil is moderately deep, extremely steep, and well drained. It is typically near the head of the East and West Forks of the Greenbrier River, on the higher elevations of Back Allegheny Mountain and Gauley Mountain, and in the Cranberry Wilderness area. Most of the acreage of the soil is on side slopes in Monongahela National Forest. Slopes range from 55 to 80 percent but are dominantly 55 to 65 percent. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark brown channery silt loam about 3 inches thick. It is underlain by dark brown channery silt loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 4 inches is dark yellowish brown channery silt loam, and the lower 19 inches is yellowish brown very channery silt loam. The substratum is yellowish brown extremely channery silt loam. Highly weathered, dark grayish brown siltstone bedrock is at a depth of about 36 inches.

Included with this soil in mapping are a few small areas of soils having sandier textures than those of the Mandy soil, areas of soils that have less than 15 percent rock fragments in the surface layer, areas of soils that have slopes of less than 55 percent, and areas of rock outcrop. Inclusions make up about 20 percent of the unit.

The available water capacity is very low to moderate in the Mandy soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 20 to 40 inches. The soil is susceptible to downslope movement.

This soil is not suited to cultivated crops, hay, pasture, or urban uses because of the slope. All of the acreage of the soil is wooded.

The potential productivity for trees is moderately high on this soil. The limitations for harvesting timber are severe because of the slope. Erosion is a management concern. Operating conventional skidder or tractor logging equipment and constructing roads are not recommended because of the high potential for erosion. Conventional operations should only be used if it is determined that the amount of erosion can be kept to a minimum through the use of site specific mitigation measures. Alternate logging systems, such as high lead cable logging, that are adapted to the slope should be used when timber is harvested. These systems allow an area to be harvested without the use of skid trails, thus greatly reducing the potential for erosion.

The dominant plant communities in the overstory on this soil are black cherry, American beech, sugar maple, yellow birch, and red spruce. The dominant plant communities in the understory are American beech, mountain holly, red spruce, red maple, and striped maple, and those in the ground cover are ferns, violets, foamflower, Indian turnip, and grasses.

This soil has severe limitations affecting recreational development. Trails can be built in areas of the soil; however, construction is difficult. Erosion is a management concern. Trails should be constructed on a gentle grade across the slope. Switchbacks may be necessary on the trails. Water bars help to control erosion. Periodic maintenance of the trails is necessary because the soil from cutbanks sloughs onto the trails.

This soil has poor potential for woodland and openland wildlife habitat. It supports some large and small game species, such as black bear, white-tailed deer, wild turkey.

This soil has very severe limitations affecting urban uses. As a result, it is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

Mh—Medihemists, very deep

These nearly level, very poorly drained soils formed in organic material. They generally are on broad flats near the head of drainageways at elevations of more than 3,000 feet. Slopes range from 0 to 3 percent.

Included with these soils in mapping are a few small areas of the well drained to poorly drained Udifluvents and Fluvaquents, the poorly drained Trussel soils, and the well drained Shouns soils. Included soils make up about 15 percent of the unit.

The available water capacity is high in the Medihemists. Permeability is very slow, and natural fertility is low. In unlimed areas reaction is extremely acid or very strongly acid. The depth to bedrock is more than 60 inches.

The content of water makes these soils poorly suited to farming, woodland, recreation, and urban development. Most areas are used for wildlife habitat (fig. 6). The potential of the soils for uses other than wetland wildlife habitat is poor. The soils have good potential for wetland wildlife habitat because they support wetland plants and are in shallow water areas.

These soils have not been assigned a capability subclass or a woodland ordination symbol.

MrB—Mertz channery silt loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and well drained. It is typically on foot slopes and benches in the eastern half of the county.

Typically, the surface layer is very dark grayish brown channery silt loam about 2 inches thick. It is underlain by dark grayish brown channery silt loam about 1 inch thick. The subsoil is about 51 inches thick. The upper 5 inches is dark yellowish brown channery silt loam, the next 13 inches is yellowish brown channery silty clay loam, the next 15 inches is yellowish brown very channery clay loam, and the lower 18 inches is extremely channery silty clay loam. The substratum to a depth of 65 inches or more is yellowish brown extremely channery silty clay loam.

Included with this soil in mapping are areas of the shallow Weikert soils on steep side slopes and the very deep Elliber soils on steep foot slopes and side slopes. Also included are areas of soils that have fewer rock fragments in the profile than the Mertz soil, areas of moderately well drained soils, areas of soils that have a dense substratum, and areas of soils that have slopes of more than 8 percent. Included soils make up about 25 percent of the unit.

The available water capacity is moderate or high in the Mertz soil. Permeability is moderately slow in the subsoil. Runoff and natural fertility are medium. In unlimed areas reaction is strongly acid or moderately acid in the solum and very strongly acid or strongly acid in the substratum. The depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. If the soil is cultivated, applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Seedling mortality and plant competition are limitations. Selecting planting stock that has a well developed root system and timing planting to take full advantage of spring rains help to control plant competition and to ensure the successful establishment of tree plantations. Harvest methods that do not remove all of the overstory reduce plant competition. Generally, no major limitations affect the use of equipment for logging operations; however, if unsurfaced roads are used during wet periods when the soil is soft, operating wheeled and tracked equipment results in excessive rutting. Using special

Figure 6.—Cranberry Glades Botanical Area in Monongahela National Forest includes the most extensive acreage of Medihemists, very deep, in the county.

low ground pressure equipment when the soil is wet minimizes the damage. Seeding roads, skid trails, and log landings and keeping the total mileage of roads and skid trails to a minimum help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, red maple, and pitch pine. The dominant plant communities in the understory are flowering dogwood, mountain laurel, eastern white pine, witch hazel, common serviceberry, and red maple, and those in the ground cover are ground pine, teaberry, deerberry, late low blueberry, black huckleberry, grasses, clovers, and yarrow.

Small stones and the moderately slow permeability in the subsoil are the main limitations affecting recreational development in areas of this soil. The stones should be removed or covered with fill material that is free of stones. Diversions should be installed to help remove surface water, or a subsurface drainage system should be installed to help remove excess water.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada goose, and mourning dove, as well as various songbirds. The wooded areas support moderate populations of white-tailed deer.

Low strength and the moderately slow permeability are the main limitations affecting most urban uses. This soil has only slight limitations on sites for dwellings.

This soil is limited as a site for septic tank absorption fields because of the moderately slow permeability. Choosing areas of included soils and installing a larger filter field may help to overcome this limitation.

Low strength and small stones are the major limitations in areas cleared for construction. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes damage caused by low strength.

The capability subclass is IIe. The woodland ordination symbol is 4A.

MzC—Mertz channery silt loam, 8 to 15 percent slopes, very stony

This soil is very deep, strongly sloping, and well drained. It is typically on foot slopes and benches in the eastern half of the county. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark grayish brown channery silt loam about 2 inches thick. It is underlain by dark grayish brown channery silt loam about 1 inch thick. The subsoil is about 51 inches thick. The upper 5 inches is dark yellowish brown channery silt loam, the next 13 inches is yellowish brown channery silty clay loam, the next 15 inches is yellowish brown very channery clay loam, and the lower 18 inches is extremely channery silty clay loam. The substratum to a depth of 65 inches or more is yellowish brown extremely channery silty clay loam.

Included with this soil in mapping are areas of the shallow Weikert soils on steep side slopes and the very deep Elliber soils on steep foot slopes and side slopes. Also included are areas of soils that have fewer rock fragments in the profile than the Mertz soil, areas of moderately well drained soils, areas of soils that have a dense substratum, and areas of soils that have slopes of more than 15 percent. Included soils make up about 25 percent of the unit.

The available water capacity is low or moderate in the Mertz soil. Permeability is moderately slow in the subsoil. Runoff is medium or rapid, and natural fertility is medium. In unlimed areas reaction is strongly acid or moderately acid in the solum and very strongly acid or strongly acid in the substratum. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay but is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is the major management concern. Seedling mortality is a moderate limitation. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Selecting planting stock that has a well developed root system and planting as early as possible to take full advantage of spring rains reduce the seedling mortality rate. In natural stands, harvest methods that do not expose the soil surface to the drying effects of the sun also reduce the seedling mortality rate. No major limitations affect harvesting. Roads should not be used during wet periods. If roads must be used when the soil is wet, adding gravel to the surface minimizes the formation of ruts. The gravel can possibly be obtained from nearby deposits of chert. Planting filter strips along streams, installing water bars, and revegetating disturbed areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, red maple, and pitch pine. The dominant plant communities in the understory are flowering dogwood, mountain laurel, eastern white pine, witch hazel, common serviceberry, and red maple, and those in the ground cover are ground pine, teaberry, deerberry, late low blueberry, black huckleberry, grasses, clovers, and yarrow.

This soil has severe limitations affecting most recreational development. The management concerns are small stones in camp areas and picnic areas and large stones in areas used as playgrounds. No major limitations affect the development of paths and trails; however, installing water-control structures and revegetating bare areas help to control surface runoff and erosion.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Some areas of woodland support a moderate population of ruffed grouse, red and gray squirrels, and other small game and nongame species, and large game species, including black bear, white-tailed deer, and wild turkey. The open areas provide forage for many species.

The slope, low strength, and the moderately slow permeability are the main limitations affecting most urban uses. The slope is the main limitation on sites for dwellings. Land shaping and designing the dwellings so that they conform to the natural slope of the land minimize the effects of the slope.

The slope and the moderately slow permeability are limitations on sites for septic tank absorption fields. Installing a larger filter field or choosing an alternate absorption system minimizes the restrictions.

Low strength is a moderate limitation on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is VIs. The woodland ordination symbol is 4A.

MzE—Mertz channery silt loam, 15 to 35 percent slopes, very stony

This soil is very deep, steep and moderately steep, and well drained. It is typically on foot slopes and benches in the eastern half of the county. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is very dark grayish brown channery silt loam about 2 inches thick. It is underlain by dark grayish brown channery silt loam about 1 inch thick. The subsoil is about 51 inches thick. The upper 5 inches is dark yellowish brown channery silt loam, the next 13 inches is yellowish brown channery silty clay loam, the next 15 inches is yellowish brown very channery clay loam, and the lower 18 inches is extremely channery silty clay loam. The substratum to a depth of 65 inches or more is yellowish brown extremely channery silty clay loam.

Included with this soil in mapping are areas of the shallow Weikert soils on steep side slopes and the very deep Elliber soils on steep foot slopes and side slopes. Also included are areas of soils that have fewer rock fragments in the profile than the Mertz soil, areas of moderately well drained soils, areas of soils that have a dense substratum, and areas of soils that have slopes of less than 15 percent or more than 35 percent. Included soils make up about 25 percent of the unit.

The available water capacity is low or moderate in the Mertz soil. Permeability is moderately slow in the subsoil. Runoff is rapid or very rapid, and natural fertility is medium. In unlimed areas reaction is strongly acid or moderately acid in the solum and very strongly acid or strongly acid in the substratum. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Plant competition is the main limitation. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. Site preparation following harvest and the establishment of new forest cover as soon as possible also reduce plant competition. Regeneration cuts that leave an isolated single tree or an isolated group of trees are not recommended. The slope and low strength are limitations affecting the operability of logging equipment and the construction of haul roads, skid trails, and log landings, which are needed for equipment accessibility. Erosion is a concern in areas that have been cut and filled for roads. Establishing a plant cover in these areas helps to control erosion. Laying out roads and trails on a gentle grade across the slope, controlling surface runoff, seeding roads, trails, and landings, and keeping the total mileage or roads and trails to a minimum also help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, red maple, and pitch pine. The dominant plant communities in the understory are flowering dogwood, mountain laurel, eastern white pine, witch hazel, common serviceberry, and red maple, and those in the ground cover are ground pine, teaberry, deerberry, late low blueberry, black huckleberry, grasses, clovers, and yarrow.

This soil has severe limitations affecting most recreational development. Small and large stones and the slope are the main limitations in camp areas, in picnic areas, on playgrounds, and on paths and trails. Laying out paths and trails on a gentle grade across the slope and installing water-control structures to help control surface runoff minimize the effects of the slope.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Some areas of woodland support a moderate population of ruffed grouse, red and gray squirrels, and other small game and nongame species, and large game species, including black bear, white-tailed deer, and wild turkey. The open areas provide forage for many species.

The slope and the moderately slow permeability are severe limitations affecting all urban uses. This soil generally is not used for urban development. Areas of included soils that are less sloping may be better suited to these uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

Or—Orrville silt loam

This soil is very deep, nearly level, and somewhat poorly drained. It is typically on flood plains east of the Greenbrier River and is subject to occasional flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsoil is about 31 inches thick. The upper 4 inches is yellowish brown silt loam, and the lower 27 inches is grayish brown silt loam that has yellowish red, reddish yellow, and gray mottles. The substratum extends to a depth of 65 inches or more. The upper 10 inches is gray silt loam that has strong brown, reddish yellow, and yellowish red mottles, and the lower part is gray very gravelly loam that has reddish yellow and yellowish red mottles.

Included with this soil in mapping are a few small areas of the well drained Tioga and Macove soils, the poorly drained Holly soils, the moderately well drained Lobdell soils, and the somewhat excessively drained Potomac soils. Included soils make up about 20 percent of the unit.

The available water capacity is high in the Orrville soil. Permeability is moderate in the subsoil. Runoff is slow, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to slightly acid. The seasonal high water table is at a depth of 1 to 2 feet. It restricts the root zone of some types of plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are in hay or pasture. Some areas are used for cultivated crops.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture plants that can tolerate the wetness. The hazard of erosion is slight. Planting in spring may be delayed by the wetness. Minimizing tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Grasses rather than legumes are better suited to the soil because of the seasonal high water table. The wetness is the major management concern in pastured areas. Proper stocking rates that help to maintain desirable grasses, a rotation grazing system, and deferment of grazing in the spring until the soil is reasonably firm are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil; however, only a small acreage is wooded. Logging should be deferred during wet periods until the soil is reasonably firm. Plant competition is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, river birch, and American sycamore. The dominant plant communities in the understory are eastern white pine, brookside alder, and river birch, and those in the ground cover are sedges, reeds, and milkweed.

The wetness and the flooding are limitations affecting most recreational development in areas of this soil. Installing a drainage system and selecting areas of included soils that are better drained and are flooded less often minimize the damage caused by wetness and flooding.

This soil has good potential for woodland and openland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

This soil has severe limitations as a site for most urban uses because of the flooding and the wetness. Areas of the included Macove soils have fewer restrictive features affecting most urban uses.

The capability subclass is IIw. The woodland ordination symbol is 4W.

Ph—Philo silt loam

This soil is very deep, nearly level, and moderately well drained. It is typically on flood plains of the Deer Creek watershed in the northeastern part of the county and is subject to occasional flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark brown silt loam about 9 inches thick. The subsoil is about 24 inches thick. The upper 10 inches is yellowish brown loam, the next 7 inches is yellowish brown silt loam that has gray and strong brown mottles, and the lower 7 inches is yellowish brown gravelly loam that has gray and strong brown mottles. The substratum extends to a depth of 65 inches or more. The upper 7 inches is brown very gravelly loam that has gray and strong brown mottles, the next 8 inches is mixed brown and gray extremely gravelly loam that has strong brown mottles, and the lower 17 inches is light olive brown extremely gravelly loam that has gray and strong brown mottles.

Included with this soil in mapping are small areas of the poorly drained Atkins soils and the well drained Macove soils. Also included are areas of soils that are gravelly or cobbly in the surface layer. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Philo soil. Permeability is moderate in the subsoil and rapid or very rapid in the substratum. Runoff is slow, and natural fertility is medium. In unlimed areas reaction is very strongly acid to moderately acid. The seasonal high water table is at a depth of 1.5 to 3.0 feet. It restricts the root zone of some types of plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or woodland.

This soil is suited to cultivated crops, hay, and pasture. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are management concerns in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil. Plant competition is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Adding gravel to the surface of haul roads, skid roads, and log landings helps to increase soil strength.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, river birch, and American sycamore. The dominant plant communities in the understory are eastern white pine, river birch, and rhododendron, and those in the ground cover are grasses.

The flooding, the wetness, and small stones are the main limitations affecting most recreational development in areas of this soil. Installing a drainage system and selecting areas of included soils that are better drained and are flooded less often minimize the damage caused by wetness and flooding. The small stones should be removed or covered with fill material that is free of stones.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

This soil has severe limitations as a site for most urban uses because of the flooding.

The capability subclass is IIw. The woodland ordination symbol is 5A.

Po—Potomac loam

This soil is very deep, nearly level, and somewhat excessively drained. It is typically on moderately wide to narrow flood plains in the eastern half of the county and is subject to frequent flooding.

Typically, the surface layer is dark brown loam about 10 inches thick. The substratum extends to a depth of more than 65 inches. It is brown. The upper 11 inches is extremely gravelly sandy loam, the next 19 inches is extremely gravelly loamy coarse sand that has pockets of sandy loam, and the lower 25 inches is extremely gravelly sandy loam.

Included with this soil in mapping are a few small areas of the moderately well drained Lobdell soils and the well drained Macove soils and small areas of soils that are cobbly loam in the surface layer. Also included are some areas of soils that are similar to the Potomac soil but have a thin cambic horizon, a thin surface layer of recently deposited alluvial material, or a subhorizon in the subtratum in which the content of rock fragments is more than 80 percent. Included soils make up about 25 percent of the unit.

The available water capacity is very low or low in the Potomac soil. Permeability is rapid or very rapid in the substratum. Runoff is slow, and natural fertility is medium. In unlimed areas reaction is strongly acid to neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are in pasture or woodland. A few are used for cultivated crops or hay.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is slight. The soil is droughty because it has a high content of sand and gravel. The sand and gravel interfere with cultivation in some areas. If the soil is cultivated, minimum tillage, cover crops, and a cropping sequence that includes grasses and legumes help to increase organic matter content and maintain fertility and tilth. Overgrazing is a major management concern in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. No major limitations affect harvesting.

Planting filter strips along streams and revegetating bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, river birch, and American sycamore. The dominant plant communities in the understory are flowering dogwood, black locust, eastern white pine, and brookside alder, and those in the ground cover are grasses, mosses, jewelweed, milkweed, and Saint John's-wort.

The flooding is the main limitation affecting most recreational development in areas of this soil. Recreation facilities should not be built on the flood plain, or they should be constructed on raised fill material. Standard septic tank absorption fields are not feasible in these areas. An alternate system is needed. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather.

This soil has poor potential for woodland wildlife habitat and fair potential for openland wildlife habitat. It provides habitat for many species and generally is an important source of water. The open areas provide forage, and the wooded areas provide cover. The potential of the soil for wildlife habitat can be improved by seeding abandoned haul roads, skid trails, and landings with grasses and legumes beneficial to wildlife and by creating grassy openings in the wooded areas.

This soil is severely limited as a site for most urban uses because of the flooding, small stones, and the droughtiness. Areas of the included Macove soils are better suited to most urban uses.

The capability subclass is IVs. The woodland ordination symbol is 4F.

Pt—Potomac very gravelly loam

This soil is very deep, nearly level, and somewhat excessively drained. It is typically on moderately wide to narrow flood plains in the eastern half of the county and is subject to frequent flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark brown very gravelly loam about 10 inches thick. The substratum extends to a depth of more than 65 inches. It is brown. The upper 11 inches is extremely gravelly sandy loam, the next 19 inches is extremely gravelly loamy coarse sand that has pockets of sandy loam, and the lower 25 inches is extremely gravelly sandy loam.

Included with this soil in mapping are a few small areas of the moderately well drained Lobdell soils and the well drained Macove soils and small areas of soils that have a surface layer of loam or very cobbly loam. Also included are some areas of soils that are similar to the Potomac soil but have a thin cambic horizon, a thin surface layer of recently deposited alluvial material, or a subhorizon in the subtratum in which the content of rock fragments is more than 80 percent. Included soils make up about 25 percent of the unit.

The available water capacity is very low or low in the Potomac soil. Permeability is rapid or very rapid in the substratum. Runoff is slow, and natural fertility is medium. In unlimed areas reaction is strongly acid to neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used as pasture or are wooded. A few are used for cultivated crops or hay.

This soil is not suited to cultivated crops or hay but is suited to pasture. The hazard of erosion is slight. The soil is droughty because it has a high content of sand and gravel. The sand and gravel interfere with cultivation in some areas. Overgrazing is a major management concern in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. No major limitations affect harvesting. Planting filter strips along streams and revegetating bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, eastern white pine, river birch, and American sycamore. The dominant plant communities in the understory are flowering dogwood, black locust, eastern white pine, and brookside alder, and those in the ground cover are grasses, mosses, jewelweed, milkweed, and Saint John's-wort.

The flooding and small stones are the main limitations affecting recreational development in areas of this soil. Recreation facilities should not be built on the flood plain, or they should be constructed on raised fill material. Standard septic tank absorption fields are not feasible in these areas. An alternate system is needed. The stones should be removed or covered with fill material that is free of stones. Access roads need to have a properly designed drainage system and a graveled surface if they will be used during all kinds of weather. No serious limitations affect hiking trails.

This soil has poor potential for woodland wildlife habitat and fair potential for openland wildlife habitat. It provides habitat for many species and generally is an important source of water. The open areas provide forage, and the wooded areas provide cover. The potential of the soil for wildlife habitat can be improved by seeding abandoned haul roads, skid trails, and landings with grasses and legumes beneficial to wildlife and by creating grassy openings in the wooded areas.

This soil is severely limited as a site for most urban uses because of the flooding, the stoniness, and the droughtiness. Areas of the included Macove soils are better suited to most urban uses.

The capability subclass is Vs. The woodland ordination symbol is 4F.

Pu—Purdy silt loam

This soil is very deep, nearly level, and poorly drained. It is typically on low stream terraces, mainly along Deer Creek.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil is about 33 inches thick. The upper 4 inches is grayish brown silty clay loam, the next 5 inches is grayish brown silty clay that has brownish yellow and strong brown mottles, and the lower 24 inches is gray silty clay that has gray, strong brown, and brownish yellow mottles. The substratum to a depth of 65 inches or more is grayish brown very gravelly silty clay loam that has gray, light olive brown, and strong brown mottles.

Included with this soil in mapping are a few small areas of the well drained Chavies soils. Also included are areas of soils that are moderately well drained or somewhat poorly drained and areas of soils that have a gravelly or cobbly surface layer. Included soils make up about 25 percent of the unit.

The available water capacity is moderate or high in the Purdy soil. Permeability is slow or very slow in the subsoil. Runoff is slow or medium, and natural fertility is medium. In unlimed areas reaction is extremely acid to strongly acid. The seasonal high water table is within a depth of 1 foot. It restricts the root zone of some types of plants. The depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees. Most of the acreage is pasture or idle land.

This soil has very limited suitability for cultivated crops. It is better suited to hay and pasture plants that tolerate wetness. The hazard of erosion is slight. The wetness restricts the use of most types of farm machinery. If the soil is cultivated, minimizing tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Overgrazing is the major management concern in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing until the soil is firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil, but only a small acreage is wooded. Logging activities should be deferred during wetter periods until the soil is reasonably firm. Plant competition is a management concern. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are pin oak, yellow-poplar, and sweet gum. The dominant plant communities in the understory are eastern white pine, river birch, and rhododendron, and those in the ground cover are common Saint John's-wort, skunk cabbage, sedges, reeds, mayflower, and milkweed.

The wetness and the slow or very slow permeability are the main limitations affecting most recreational development in areas of this soil. Installing diversions to help remove surface water and installing a drainage system minimize the effects of the restrictions.

This soil has fair potential for openland, woodland, and wetland wildlife habitat. Leaving small areas of brush helps to provide food and cover for geese, ducks, muskrat, mink, and a variety of songbirds.

The wetness is a severe limitation affecting most urban uses. Areas of included soils that are better drained have fewer limitations affecting urban development.

The capability subclass is IVw. The woodland ordination symbol is 5W.

Sc—Sees silt loam

This soil is very deep, nearly level, and moderately well drained. It is in depressions and along drainageways on limestone uplands and is subject to rare flooding. Sinkholes are common in some areas. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark yellowish brown silt loam about 8 inches thick. The subsoil is about 50 inches thick. The upper 6 inches is yellowish brown silty clay, the next 6 inches is yellowish brown silty clay that has brownish gray, strong brown, and yellowish red mottles, and the lower 38 inches is gray silty clay that has brownish yellow, strong brown, and reddish brown mottles. The substratum to a depth of 65 inches or more is reddish brown silty clay that has gray, brownish yellow, and reddish yellow mottles. In places the soils have a redder subsoil, have gray mottles higher in the subsoil, or have more clay throughout the profile.

Included with this soil in mapping are a few small areas of the well drained Shouns soils and the poorly drained Holly soils. Included soils make up about 20 percent of the unit.

The available water capacity is high in the Sees soil. Permeability is slow in the subsoil. Runoff is slow, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to neutral in the solum and neutral to moderately alkaline in the substratum. The seasonal high water table is at a depth of 1 to 2 feet. It restricts the root zone of some types of plants.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Only a few small areas are wooded.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture plants that tolerate wetness. The wetness restricts the use of most types of farm machinery. If the soil is cultivated, minimizing tillage, including hay in the cropping sequence, delaying tillage until the soil is reasonably dry, and returning crop residue to the soil help to maintain fertility and tilth. Overgrazing is the major management concern in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing until the soil is firm are the major management needs in pastured areas.

The potential productivity for trees is moderately high on this soil. Controlling competing vegetation and selecting planting stock that has a well developed root system help to ensure the successful establishment of tree plantations.

The dominant plant communities in the overstory on this soil are white oak, shingle oak, red maple, and quaking aspen. The dominant plant communities in the understory are flowering dogwood, silky dogwood, black willow, and white willow, and those in the ground cover are grasses, mosses, pipestem, and Saint John's-wort.

The wetness and the slow permeability are the main limitations affecting recreational development in areas of this soil. Installing diversions to help remove surface water and installing a drainage system minimize the effects of the restrictions. Paths and trails can be developed in areas of the soil. They need a properly designed drainage system and a graveled surface.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides food and cover for game species, such as bobwhite quail, cottontail rabbit, Canada geese, and mourning dove, as well as various songbirds.

The wetness, a shrink-swell potential, low strength, and the slow permeability are the main limitations affecting most urban uses. The wetness and the shrink-swell potential are limitations on sites for dwellings without basements. Installing properly designed footers and footer drains, diverting surface water away from foundations, backfilling with porous material, and selecting the best drained areas as homesites minimize the effects of the limitations. The soil should not be used as a site for dwellings with basements.

The wetness and the slow permeability are limitations on sites for septic tank absorption fields. Selecting areas of the included well drained soils as sites, installing a drainage system around the filter field, or installing a specially designed system or an alternate system approved by the county sanitarian may minimize the effects of these limitations.

Low strength and the wetness are the main limitations on sites for local roads and streets. Providing suitable base material to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

Planning carefully so that only a minimal amount of the soil surface is disturbed, revegetating during or soon after construction, and properly disposing of surface water help to control erosion on construction sites. Topsoil should be stockpiled for use in revegetation.

The capability subclass is IIIw. The woodland ordination symbol is 5A.

Se—Sensabaugh silt loam

This soil is very deep, nearly level, and well drained. It is on flood plains along small streams and drainageways west of the Greenbrier River and is subject to occasional flooding. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark reddish brown silt loam about 6 inches thick. The subsoil is about 34 inches thick. It is dark reddish brown. The upper 15 inches is gravelly loam, the next 13 inches is gravelly sandy clay loam, and the lower 6 inches is very gravelly loam. The substratum extends to a depth of 65 inches or more. The upper 15 inches is reddish brown very gravelly loam, and the lower part is dark reddish brown extremely gravelly loam.

Included with this soil in mapping are a few small areas of the well drained Chavies soils, the poorly drained Holly soils, and the somewhat excessively drained Potomac soils. Also included are areas of soils that have a higher content of rock fragments in the profile. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Sensabaugh soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is slow, and natural fertility is medium or high. In unlimed areas reaction is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture. Some small areas are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is slight. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain fertility and tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are the major management concerns in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil, but only a small acreage is wooded. Plant competition is severe if openings are made in the canopy. Harvest methods that do not remove all of the overstory or applications of herbicides reduce plant competition. The seedling mortality rate is moderate. It can be reduced by planting containerized seedlings or more mature seedlings.

The dominant plant communities in the overstory on this soil are yellow-poplar, white oak, river birch, and American sycamore. The dominant plant communities in the understory are rhododendron, river birch, and brookside alder, and those in the ground cover are grasses, mosses, and goldenrod.

Few limitations affect the development of picnic areas and trails. The flooding and small stones are moderate limitations on sites for playgrounds, and the flooding is a severe limitation in camp areas. Recreation facilities should not be built on the flood plain, or they should be constructed on raised fill material. The stones should be removed or covered with fill material that is free of stones.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of birds.

The flooding is the major limitation affecting most urban uses. It limits the soil as a site for dwellings, septic tank filter fields, and local roads and streets.

The capability subclass is IIw. The woodland ordination symbol is 4A.

ShB—Shouns silt loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and well drained. It is typically on foot slopes and benches, mainly in the Hillsboro area.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 50 inches thick. The upper 3 inches is brown silt loam, the next 17 inches is reddish brown channery silty clay loam, the next 17 inches is reddish brown very channery silty clay loam, and the lower 13 inches is dark reddish brown very channery clay loam. The substratum to a depth of 65 inches or more is dark red very channery clay loam.

Included with this soil in mapping are a few small areas of the very deep Lodi soils, the deep Belmont and Duffield soils, and the moderately deep Cateache soils. Also included are areas of soils that are moderately well drained, areas of soils that have more than 35 percent clay in the subsoil, areas of rock outcrop and associated sinkholes, areas of soils that have cobbles on the surface, areas of soils that are flooded when sinkholes become blocked, and areas of soils that have slopes of less than 3 percent or more than 8 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is moderate or high in the Shouns soil. Permeability is moderate in the subsoil. Runoff is medium, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is moderate in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, American beech, black cherry, eastern hemlock, white oak, and sugar maple. The dominant plant communities in the understory are striped maple, witch hazel, black birch, black cherry, American beech, flowering dogwood, rhododendron, and black locust, and those in the ground cover are mayapple, false Solomon's seal, blue cohosh, American lily-of-the-valley, black cohosh, ramps, grasses, ferns, mosses, and wood nettle.

The slope and small stones are the main limitations on sites for playgrounds. The other recreational development activities are not limited by these features. Land shaping or grading to create level areas or locating the facilities in the less sloping areas minimizes the effects of the slope. The stones should be removed or covered with fill material that is free of stones.

This soil has good potential for woodland and openland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for ruffed grouse, bobwhite quail, cottontail rabbit, and a variety of songbirds.

Low strength and the potential for frost action are the main limitations affecting most urban uses. This soil has few limitations on sites for dwellings.

The moderate permeability in the subsoil is the main limitation on sites for septic tank absorption fields. Enlarging the size of the filter field and digging wide, deep trenches under the distribution lines minimize the effects of the restricted permeability.

Low strength is the main limitation on sites for local roads and streets. Adding suitable base material or providing special construction techniques to enhance the load-bearing capacity of the soil minimizes the damage caused by low strength.

The capability subclass is IIe. The woodland ordination symbol is 4A.

ShC—Shouns silt loam, 8 to 15 percent slopes

This soil is very deep, strongly sloping, and well drained. It is typically on foot slopes and benches in the Hillsboro area.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 50 inches thick. The upper 3 inches is brown silt loam, the next 17 inches is reddish brown channery silty clay loam, the next 17 inches is reddish brown very channery silty clay loam, and the lower 13 inches is dark reddish brown very channery clay loam. The substratum to a depth of 65 inches or more is dark red very channery clay loam.

Included with this soil in mapping are a few small areas of the very deep Lodi soils, the deep Belmont and Duffield soils, and the moderately deep Cateache soils. Also included are areas of soils that are moderately well drained and areas of soils that have slopes of less than 8 percent or more than 15 percent. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Shouns soil. Permeability is moderate in the subsoil. Runoff is rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few are used as pasture or are wooded.

This soil is suited to cultivated crops, hay, and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. Applying a system of conservation tillage, cultivating on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, American beech, black cherry, eastern hemlock, white oak, and sugar maple. The dominant plant communities in the understory are striped maple, witch hazel, black birch, black cherry, American beech, flowering dogwood, rhododendron, and black locust, and those in the ground cover are mayapple, false Solomon's seal, blue cohosh, American lily-of-the-valley, black cohosh, ramps, grasses, ferns, mosses, and wood nettle.

The slope is the main limitation affecting most recreational development in areas of this soil. The effects of the slope can be minimized by excavating the soil to create level areas. The topsoil removed during excavation should be saved and used when revegetating the cleared areas.

This soil has good potential for woodland and openland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for ruffed grouse, bobwhite quail, cottontail rabbit, and a variety of songbirds.

The slope and low strength are the main limitations affecting urban development. Areas of included soils that have slopes of 3 to 8 percent have fewer restrictive features affecting most urban uses.

The slope is the main limitation on sites for dwellings. Designing dwellings so that they conform to the natural slope of the land and to the setting minimizes this restrictive feature. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The slope is the main limitation on sites for septic tank absorption fields. Installing distribution lines across the slope or land shaping minimize the effects of the restrictions caused by the slope.

Low strength and the slope are the main limitations on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil and constructing roads and streets on the contour minimize the effects of the restrictions.

The capability subclass is IIIe. The woodland ordination symbol is 4A.

SsC—Shouns silt loam, 3 to 15 percent slopes, extremely stony

This soil is very deep, strongly sloping and gently sloping, and well drained. It is typically on foot slopes and benches and in coves and drainageways throughout the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 50 inches thick. The upper 3 inches is brown silt loam, the next 17 inches is reddish brown channery silty clay loam, the next 17 inches is reddish brown very channery silty clay loam, and the lower 13 inches is dark reddish brown very channery clay loam. The substratum to a depth of 65 inches or more is dark red very channery clay loam.

Included with this soil in mapping are a few small areas of the deep Belmont soils and the moderately deep Calvin and Cateache soils. Also included are areas of soils that are moderately well drained, areas where stones cover less than 3 percent of the surface, areas of alluvial soils adjacent to drainageways, areas of soils that have slopes of more than 15 percent, areas near drainageways where the soils have a dense layer in the subsoil, and areas west of the Greenbrier River where boulders cover 3 to 15 percent of the surface. Inclusions make up about 20 percent of the unit.

The available water capacity is moderate or high in the Shouns soil. Permeability is moderate in the subsoil. Runoff is medium or rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used as pasture or are wooded. The soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. Erosion on roads, skid trails, and log landings and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, American beech, black cherry, eastern hemlock, white oak, and sugar maple. The dominant plant communities in the understory are striped maple, witch hazel, black birch, black cherry, American beech, flowering dogwood, rhododendron, and black locust, and those in the ground cover are mayapple, false Solomon’s seal, blue cohosh, American lily-of-the-valley, black cohosh, ramps, grasses, ferns, mosses, and wood nettle.

Large stones and the slope are limitations affecting recreational development in areas of this soil. Areas that are less sloping and have fewer stones on the surface have fewer restrictions affecting recreational uses.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer, black bear, and turkey are abundant in many areas of the soil.

The slope and low strength are the main limitations affecting urban development. Areas of this soil that have slopes of 3 to 8 percent have fewer restrictive features affecting most urban development.

The slope is the main limitation on sites for dwellings. Designing dwellings so that they conform to the natural slope of the land and to the setting minimize the restrictions caused by the slope. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The slope is the main limitation on sites for septic tank absorption fields. Installing distribution lines across the slope or land shaping minimize the effects of the restrictions caused by the slope.

Low strength and the slope are the main limitations on sites for local roads and streets. Adding suitable base material or utilizing special construction techniques to enhance the load-bearing capacity of the soil and constructing roads and streets on the contour minimize the effects of the restrictions.

The capability subclass is VIIs. The woodland ordination symbol is 4X.

SsE—Shouns silt loam, 15 to 35 percent slopes, extremely stony

This soil is very deep, steep and moderately steep, and well drained. It is typically on foot slopes and benches and in coves and drainageways throughout the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 50 inches thick. The upper 3 inches is brown silt loam, the next 17 inches is reddish brown channery silty clay loam, the next 17 inches is reddish brown very channery silty clay loam, and the lower 13 inches is dark reddish brown very channery clay loam. The substratum to a depth of 65 inches or more is dark red very channery clay loam.

Included with this soil in mapping are a few small areas of the deep Belmont soils and the moderately deep Calvin and Cateache soils. Also included are areas where stones cover less than 3 percent of the surface, areas of alluvial soils adjacent to drainageways, areas of soils that have slopes of less than 15 percent or more than 35 percent, areas near drainageways where the soils have a dense layer in the subsoil, and areas west of the Greenbrier River where boulders cover 3 to 15 percent of the surface. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate or high in the Shouns soil. Permeability is moderate in the subsoil. Runoff is rapid or very rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is severe or very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. The slope affects the use of some types of equipment. Erosion on roads and skid trails and plant competition are the major management concerns. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, American beech, black cherry, eastern hemlock, white oak, and sugar maple. The dominant plant communities in the understory are striped maple, witch hazel, black birch, black cherry, American beech, flowering dogwood, rhododendron, and black locust, and those in the ground cover are mayapple, false Solomon's seal, blue cohosh, American lily-of-the-valley, black cohosh, ramps, grasses, ferns, mosses, and wood nettle.

Large stones and the slope are limitations affecting recreational development in areas of this soil. Areas that are less sloping and have fewer stones on the surface have fewer restrictions affecting recreational development. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer, black bear, and turkey are abundant in many areas of the soil.

The slope and low strength are the main limitations affecting most urban uses. Areas of included soils that have slopes of 8 to 15 percent have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

SsF—Shouns silt loam, 35 to 55 percent slopes, extremely stony

This soil is very deep, very steep, and well drained. It is typically on foot slopes and in coves and drainageways throughout the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsoil is about 50 inches thick. The upper 3 inches is brown silt loam, the next 17 inches is reddish brown channery silty clay loam, the next 17 inches is reddish brown very channery silty clay loam, and the lower 13 inches is dark reddish brown very channery clay loam. The substratum to a depth of 65 inches or more is dark red very channery clay loam.

Included with this soil in mapping are a few small areas of the deep Belmont soils and the moderately deep Calvin and Cateache soils. Also included are areas where stones cover less than 3 percent of the surface, areas of alluvial soils adjacent to drainageways, areas of soils that have slopes of less than 35 percent or more than 55 percent, areas near drainageways where the soils have a dense layer in the subsoil, and areas west of the Greenbrier River where boulders cover 3 to 15 percent of the surface. Inclusions make up about 15 percent of the unit.

The available water capacity is moderate or high in the Shouns soil. Permeability is moderate in the subsoil. Runoff is very rapid, and natural fertility is medium or high. In unlimed areas reaction is very strongly acid to moderately acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some have been cleared of trees and are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on north aspects of this soil and moderate on south aspects. The slope restricts the use of some types of equipment. Erosion on roads and skid trails and plant competition are the major management concerns. Because of the slope, special equipment or management techniques are needed when timber is harvested. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion. Poor logging practices can result in very severe erosion in harvested areas. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition.

The dominant plant communities in the overstory on this soil are northern red oak, American beech, black cherry, eastern hemlock, white oak, and sugar maple. The dominant plant communities in the understory are striped maple, witch hazel, black birch, black cherry, American beech, flowering dogwood, rhododendron, and black locust, and those in the ground cover are mayapple, false Solomon's seal, blue cohosh, American lily-of-the-valley, black cohosh, ramps, grasses, ferns, mosses, and wood nettle.

Large stones and the slope are limitations affecting recreational development in areas of this soil. Areas that are less sloping and have fewer stones on the surface have fewer restrictions affecting recreational development. Laying out trails on a gentle grade across the slope and installing water-control structures minimize the effects of the slope on paths and trails.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer, black bear, and turkey are abundant in many areas of the soil.

The slope and low strength are the main limitations affecting most urban uses. Areas of included soils that are less sloping have fewer restrictive features affecting most urban uses.

The capability subclass is VIIs. The woodland ordination symbol is 4R on north aspects and 3R on south aspects.

SwE—Snowdog silt loam, 15 to 35 percent slopes, extremely stony

This soil is very deep, steep and moderately steep, and moderately well drained. It is typically at the higher elevations on the lower side slopes, foot slopes, and benches west of the Greenbrier River. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is very dark brown silt loam about 2 inches thick. The subsoil is about 53 inches thick. The upper 2 inches is dark brown silt loam; the next 12 inches is yellowish brown channery silt loam; the next 24 inches is a fragipan of very firm, brittle, yellowish brown very channery loam that has grayish brown and yellowish brown mottles; and the lower 15 inches is yellowish brown very channery sandy loam that has grayish brown and yellowish brown mottles. The substratum to a depth of 65 inches or more is yellowish brown channery silt loam that has grayish brown and yellowish brown mottles.

Included with this soil in mapping are a few small areas of the poorly drained Trussel soils. Also included are areas where stones cover less than 3 percent or more than 15 percent of the surface and areas of soils that have slopes of more than 35 percent. Inclusions make up about 25 percent of the unit.

The available water capacity is very low or low in the Snowdog soil. Permeability is moderate above the fragipan and slow or moderately slow in the fragipan. Runoff is rapid or very rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The seasonal high water table is at a depth of 1.0 to 2.5 feet. It restricts the root zone of some types of plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some small areas near the head of the East Fork of the Greenbrier River are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture because of the stones, the slope, and the short growing season. The hazard of erosion is very severe in unprotected areas. It is a management concern. The slope and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderately high on this soil. The slope affects the use of some types of equipment. Erosion on roads and skid trails and plant competition are the major management concerns. Laying out roads and trails on a gentle grade across the slope and seeding and mulching bare areas help to control erosion. Site preparation following harvest, the establishment of new forest cover as soon as possible, and applications of herbicides reduce plant competition.

The dominant plant communities in the overstory on this soil are black cherry, red spruce, red maple, and yellow birch. The dominant plant communities in the understory are red spruce, yellow birch, American beech, eastern hemlock, rhododendron, mountain holly, and mountain maple, and those in the ground cover are clubmoss, groundpine, ferns, and wood sorrell.

Large and small stones and the slope are the main limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading to create level areas or by designing the facilities so that they conform to the natural slope of the land. The stones should be removed or covered with fill material that is free of stones.

This soil has fair potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Woodland areas support large game species, such as black bear, white-tailed deer, and wild turkey, and nongame species, such as pileated woodpeckers, reptiles, and a variety of songbirds.

The slope is the main limitation affecting most urban uses. This soil essentially is not used for urban development.

The capability subclass is VIIs. The woodland ordination symbol is 4R.

Tg—Tioga fine sandy loam

This soil is very deep, nearly level, and well drained. It is on the flood plains of the Greenbrier River and its tributaries and is subject to occasional flooding. Individual areas generally are long and narrow. Slope ranges from 0 to 3 percent.

Typically, the surface layer is dark yellowish brown fine sandy loam about 10 inches thick. The subsoil is brown fine sandy loam about 28 inches thick. The substratum to a depth of 65 inches or more is brown fine sandy loam.

Included with this soil in mapping are a few small areas of the somewhat excessively drained Potomac soils, the well drained Chavies soils, the moderately well drained Lobdell soils, and the somewhat poorly drained Orrville soils. Also included are areas of soils that are silt loam throughout the profile. Included soils make up about 20 percent of the unit.

The available water capacity is moderate or high in the Tioga soil. Permeability is moderate or moderately rapid in the subsoil. Runoff is slow or medium, and natural fertility is medium or high. In unlimed areas reaction is strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

Most areas of this soil have been cleared of trees and are used for cultivated crops, hay, or pasture (fig. 7). Some small areas have not been cleared of trees because access to the areas is severely restricted by the Greenbrier River or by extremely steep side slopes.

This soil is well suited to cultivated crops, hay, and pasture. The hazard of erosion is slight. Cultivated crops can be grown continuously. If the soil is cultivated, minimum tillage, cover crops, and a cropping system that includes grasses and legumes help to increase organic matter content and maintain

Figure 7.—An area of Tioga fine sandy loam used for the production of grass-legume hay.

fertility and tilth. Establishing and maintaining a mixture of grasses and legumes and applying a proper grazing system are management needs in pastured areas. Proper stocking rates, a rotation grazing system, and deferment of grazing help to maintain desirable grasses and legumes.

The potential productivity for trees is moderately high on this soil, but only a small acreage is wooded. No major limitations affect woodland management. Planting filter strips along streams and revegetating bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, yellow-poplar, American sycamore, river birch, and yellow buckeye. The dominant plant communities in the understory are rhododendron, greenbrier, and hawthorn, and those in the ground cover are grasses.

The flooding is the main limitation affecting recreational development in areas of this soil. Recreation facilities should not be built on the flood plain, or they should be constructed on raised fill material.

This soil has good potential for openland and woodland wildlife habitat. Leaving small areas of crops and hay unharvested along fence rows, field margins, and farm ponds provides cover for white-tailed deer, ruffed grouse, squirrels, bobwhite quail, cottontail rabbit, and a variety of songbirds.

This soil is severely limited as a site for urban uses because of the flooding.

The capability class is I. The woodland ordination symbol is 4A.

TrC—Trussel silt loam, 3 to 15 percent slopes, very stony

This soil is very deep, strongly sloping and gently sloping, and poorly drained. It is typically on foot slopes and benches near the head of the East Fork of the Greenbrier River, along tributaries of Shavers Fork of Cheat River, and in the Cranberry Wilderness area. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is black silt loam about 2 inches thick. It is underlain by 4 inches of light brownish gray silt loam that has brownish yellow mottles. The subsoil is about 41 inches thick. The upper 5 inches is gray silt loam that has brownish yellow and dark yellowish brown mottles; the next 7 inches is gray channery silt loam that has yellowish brown and dark yellowish brown mottles; the next 17 inches is a fragipan of firm, brittle, olive channery loam that has gray and strong brown mottles; and the lower 12 inches is light olive gray very channery loam that has strong brown mottles. The substratum to a depth of 65 inches or more is light olive brown very channery loam that has gray and strong brown mottles.

Included with this soil in mapping are a few small areas of the moderately well drained Snowdog soils and the well drained to poorly drained Udifluvents and Fluvaquents. Also included are areas where stones cover more than 3 percent of the surface. Inclusions make up about 20 percent of the unit.

The available water capacity is very low or low in the Trussel soil. Permeability is moderate above the fragipan and slow or moderately slow in the fragipan. Runoff is medium or rapid, and natural fertility is low. In unlimed areas reaction is extremely acid to strongly acid. The seasonal high water table is within a depth of 6 inches. It restricts the root zone of most types of plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. They are in Monongahela National Forest.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is moderate or severe in unprotected areas. It is a management concern. The wetness and the stones restrict the use of most types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for red spruce is high on this soil. Plant competition and the wetness are the major management concerns. Site preparation following harvest and the establishment of new forest cover as soon as possible reduce plant competition. Logging should be deferred during wet periods until the soil is reasonably firm. Adding gravel to the surface of main roads minimizes the effects of the wetness.

The dominant plant communities in the overstory on this soil are red spruce, red maple, black cherry, and yellow birch. The dominant plant communities in the understory are red spruce, yellow birch, serviceberry, American beech, and black birch, and those in the ground cover are groundpine, partridge berry, grasses, and ferns.

The wetness, the slope, and large stones are limitations affecting recreational development in areas of this soil. The effects of the slope can be minimized by land shaping and grading or by designing the facilities so that they conform to the natural slope of the land. The large stones should be removed or covered with additional fill material. Installing diversions and drainage systems minimizes the restrictions caused by the wetness.

This soil has poor potential for woodland and openland wildlife habitat. Some areas of woodland support a moderate population of small and large game species, such as woodcock, ruffed grouse, beaver, black bear, white-tailed deer, and wild turkey. The open areas provide forage for many species.

The wetness, the moderately slow permeability, and the potential for frost action are the main limitations affecting most urban uses. This soil is not used for urban development.

The capability subclass is VIs. The woodland ordination symbol is 7W.

Uf—Udifluvents-Fluvaquents complex

This map unit consists of very deep, well drained to poorly drained soils on nearly level flood plains at elevations of more than 3,000 feet. These soils occur as areas so intermingled that it was not practical to map them separately. Generally, the Udifluvents are along the larger drainageways and the Fluvaquents are along the smaller drainageways. The hazard of flooding ranges from frequent to rare. The unit is about 45 percent Udifluvents, 35 percent Fluvaquents, and 20 percent other soils. The slopes range from 0 to 3 percent.

Included with these soils in mapping are a few small areas of soils that are similar to the Udifluvents but have a cambic horizon and areas of soils that are similar to the Fluvaquents but have a histic epipedon. Also included are areas where stones cover 1 to 3 percent of the surface.

The available water capacity, permeability, natural fertility, and many other characteristics of the Udifluvents and Fluvaquents vary. Reaction ranges from extremely acid to strongly acid. The depth to bedrock is more than 60 inches.

All areas of these soils are managed for woodland and for wildlife habitat. Because of the flooding and the variability of soil properties, these soils are poorly suited to other uses.

The potential productivity for trees, the seedling mortality rate, and plant competition vary on these soils. The limitations that affect harvesting are severe. The major limiting factors are the wetness and the flooding. Operating conventional skidder or tractor logging equipment is not recommended in areas where Fluvaquents are the dominant soils. Conventional skidder or tractor logging equipment can be used in areas dominated by Udifluvents during the drier periods of the year if precautions are taken. Haul roads and landings should be built in adjacent areas of well drained soils. Because these soils are often intersected by intermittent stream channels, constructing haul roads is difficult. If haul roads are built in areas of the soils, adding gravel to the surface may be necessary. Skidding equipment should not be operated in poorly drained areas, and intermittent stream channels should not be traversed unless proper crossings have been developed. Planting filter strips along streams and seeding bare areas help to control erosion.

The dominant plant communities in the overstory on these soils are northern red oak, yellow birch, American beech, American sycamore, river birch, and red spruce. The dominant plant communities in the understory are river birch, brookside alder, American beech, American sycamore, winterberry, and swamp rose, and those in the ground cover are sphagnum moss, reeds, sedges, grasses, and ferns.

The flooding and the wetness are limitations affecting most recreational development in areas of these soils. Hiking trails can be located in areas of the soils; however, because of the wetness, special construction techniques are needed to ensure that the surface of the trails is stable and well drained.

These soils have poor or very poor potential for woodland wildlife habitat. Areas of the Fluvaquents, however, have potential to support wetland plants in shallow water areas. Many areas of the Fluvaquents are in grassy meadows, which provide food for wildlife.

These soils have not been assigned a capability subclass or a woodland ordination symbol.

Us—Udorthents, smoothed

These nearly level to extremely steep, well drained soils are in areas that have been disturbed by road construction and industrial and urban development. They are mainly along the Highland Scenic Highway (fig. 8) and in the town of Marlinton. Slopes range from 0 to 80 percent but generally are less than 15 percent.

These soils commonly are red, brown, yellow, or olive. In most areas they are loamy, but in some areas they are clayey.

Included with these soils in mapping are small areas of Berks, Cateache, Mandy, Orrville, Tioga, and Weikert soils. Also included are quarries, dumps, and storage and processing areas related to logging and tannery industries. Inclusions make up about 30 percent of the unit.

Estimating the physical and chemical properties of these soils is impractical because the soils have been disturbed and vary greatly. The soils in most fill areas, however, are more than 60 inches deep over bedrock. Runoff ranges from medium in nearly level areas to extremely rapid in extremely steep areas. Natural fertility ranges from low to high.

These soils are in areas used for building site development, or the acreage is idle land.

Because of the extreme variability of these soils, onsite investigation is necessary to determine the suitability of the soils for any proposed use.

These soils have not been assigned a capability subclass or a woodland ordination symbol.

WeC—Weikert channery silt loam, 8 to 15 percent slopes

This soil is shallow, strongly sloping, and well drained. It is typically in the eastern half of the county on low convex ridgetops or adjacent to terraces.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by yellowish brown very channery silt loam about 5 inches thick. The subsoil also is yellowish brown very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. Multicolored siltstone and shale bedrock is at a depth of about 15 inches.

Included with this soil in mapping are a few small areas of the very deep Allegheny soils and the moderately deep Berks soils. Also included are areas of soils that are less than 10 inches deep over bedrock, areas of soils that have fewer rock fragments in the profile than the Weikert soil, areas of soils that have slopes of less than 8 percent or more than 15 percent, and areas where stones cover 1 to 3 percent of the surface. Inclusions make up about 20 percent of the unit.

The available water capacity is very low in the Weikert soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. Bedrock is at a depth of 10 to 20 inches. It restricts the root zone of some types of plants.

Most areas of this soil are wooded. Some are used

Figure 8.—An area of Udorthents, smoothed, along Highland Scenic Highway. Mandy and Gauley soils are in the background.

as pasture, and a few are used for hay or cultivated crops.

This soil has limited suitability for cultivated crops. It is better suited to hay and pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. The slope, the depth to bedrock, and droughtiness during the growing season are the main restrictive features affecting cultivated crops. Applying a system of conservation tillage, growing crops on the contour, including hay in the cropping sequence, and returning crop residue to the soil help to control erosion and maintain fertility and tilth. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on this soil. Seedling mortality is severe because of the depth to bedrock and the droughtiness during the growing season. Special stock that is larger than usual, containerized seedlings, and special site preparation, such as furrowing, reduce the seedling mortality rate. Erosion on roads, skid trails, and log landings is a major management concern. Laying out roads and trails on the contour and seeding and mulching bare areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, pitch pine, eastern white pine, and chestnut oak. The dominant plant communities in the understory are eastern white pine, white oak, hickory, flowering dogwood, witch hazel, mountain laurel, and rhododendron, and those in the ground cover are white snakeroot, gaywings, late low blueberry, black huckleberry, grasses, mosses, and teaberry.

The slope, the depth to bedrock, the droughtiness, and small stones are the main limitations affecting most recreational development in areas of this soil. The soil is suitable as a site for paths and trails if the paths and trails are layed out on a gentle grade across the slope.

This soil has very poor potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and wild turkey are abundant in areas along Deer and Sitlington Creeks.

The depth to bedrock and the slope are the main limitations affecting urban uses. Areas of the included Allegheny soils have fewer restrictive features affecting urban development because they are deeper to bedrock.

The depth to bedrock and the slope are the main limitations on sites for dwellings. Building above the bedrock, adding fill material when landscaping, and designing dwellings so that they conform to the natural slope of the land and to the setting minimize the effects of the restrictions caused by the slope and the depth to bedrock. Erosion is a severe hazard in areas cleared for construction. Revegetating during or soon after construction reduces the hazard of erosion.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. Subdividing lots so that they are larger in size may help to include areas of more favorable soils in the lots. Installing an alternate system may minimize the effects of the restrictions caused by the depth to bedrock.

The depth to bedrock and the slope are the main limitations on sites for local roads and streets. Designing grades that do not require excavation of bedrock, constructing roads and streets on the contour, and adding coarse grained base material minimize the effects of the restrictions caused by the slope and the depth to bedrock.

The capability subclass is IVe. The woodland ordination symbol is 2D.

WeD—Weikert channery silt loam, 15 to 25 percent slopes

This soil is shallow, moderately steep, and well drained. It is typically in the eastern half of the county on low, narrow ridgetops and on side slopes adjacent to terraces.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by yellowish brown very channery silt loam about 5 inches thick. The subsoil also is yellowish brown very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. Multicolored siltstone and shale bedrock is at a depth of about 15 inches.

Included with this soil in mapping are a few small areas of the very deep Allegheny and Macove soils and the moderately deep Berks soils. Also included are areas of soils that are less than 10 inches deep over bedrock, areas of soils that have fewer rock fragments in the profile than the Weikert soil, areas of soils that have slopes of less than 15 percent or more than 25 percent, and areas where stones cover 1 to 3 percent of the surface. Inclusions make up about 25 percent of the unit.

The available water capacity is very low in the Weikert soil. Permeability is moderately rapid in the subsoil. Runoff is rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. Bedrock is at a depth of 10 to 20 inches. It restricts the root zone of some types of plants.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay, but it is suited to pasture. The hazard of erosion is severe in unprotected areas. It is a management concern. The slope restricts the use of some types of farm machinery. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on north and south aspects of this soil. Seedling mortality is severe because of the depth to bedrock and droughtiness during the growing season. The slope affects the use of some types of equipment. Erosion on roads and skid trails is a major management concern. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate. Laying out roads and trails on the contour and seeding these areas help to control erosion.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, pitch pine, eastern white pine, and chestnut oak. The dominant plant communities in the understory are eastern white pine, white oak, hickory, flowering dogwood, witch hazel, mountain laurel, and rhododendron, and those in the ground cover are white snakeroot, gaywings, late low blueberry, black huckleberry, grasses, mosses, and teaberry.

The depth to bedrock, the slope, the droughtiness, and small stones are the main limitations affecting most recreational development in areas of this soil. Land shaping and grading or designing the facilities so that they conform to the natural slope of the land minimizes the effects of the slope. Paths and trails should be established on a gentle grade across the slope. Water-control structures should be installed to help control surface runoff. The stones should be removed or covered with fill material that is free of stones. Maintaining a vigorously growing vegetative cover on the soil minimizes the effects of the limited depth to bedrock and the droughtiness.

This soil has very poor potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and wild turkey are abundant in areas along Deer and Sitlington Creeks.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Areas of included soils that have slopes of 8 to 15 percent and are deeper to bedrock have fewer restrictive features affecting urban development.

The capability subclass is VIe. The woodland ordination symbol is 3R on north aspects and 2R on south aspects.

WeF—Weikert channery silt loam, 25 to 55 percent slopes

This soil is shallow, steep and very steep, and well drained. It is typically in the eastern half of the county on side slopes that generally are adjacent to flood plains or terraces.

Typically, the surface layer is dark brown channery silt loam about 1 inch thick. It is underlain by yellowish brown very channery silt loam about 5 inches thick. The subsoil also is yellowish brown very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. Multicolored siltstone and shale bedrock is at a depth of about 15 inches.

Included with this soil in mapping are a few small areas of the moderately deep Berks soils on the lower side slopes, the very deep Macove soils on foot slopes and in coves, and the very deep Orrville soils on narrow flood plains. Also included are areas of soils that are less than 10 inches deep over bedrock, areas of soils that have fewer rock fragments in the profile than the Weikert soil, areas of soils that have slopes of less than 25 percent or more than 55 percent, areas where stones cover 1 to 3 percent of the surface, and areas where most of the original surface layer has been removed by erosion and the subsoil is exposed. Inclusions make up about 25 percent of the unit.

The available water capacity of this Weikert soil is very low. Permeability is moderately rapid in the subsoil. Runoff is very rapid, and natural fertility is low. In unlimed areas reaction is very strongly acid or strongly acid. The root zone of some types of plants is restricted by bedrock at a depth of 10 to 20 inches.

Most areas of this soil are wooded. Some are used as pasture.

This soil is not suited to cultivated crops or hay and is difficult to manage for pasture. The hazard of erosion is very severe in unprotected areas. It is a management concern. Erosion and overgrazing are the major management concerns in pastured areas. Proper stocking rates that help to maintain desirable grasses and legumes and a rotation grazing system are the major management needs in these areas.

The potential productivity for trees is moderate on this soil. Seedling mortality is severe because of the depth to bedrock and droughtiness during the growing season. The slope affects the use of some types of equipment. Erosion on roads and skid trails is a major management concern. Planting special stock that is larger than usual or planting containerized seedlings reduces the seedling mortality rate. Because of the slope, special equipment or management techniques are needed when timber is harvested. Laying out roads and trails on the contour and seeding these areas help to control erosion. Poor logging practices can result in very severe erosion in harvested areas.

The dominant plant communities in the overstory on this soil are northern red oak, white oak, hickory, pitch pine, eastern white pine, and chestnut oak. The dominant plant communities in the understory are eastern white pine, white oak, hickory, flowering dogwood, witch hazel, mountain laurel, and rhododendron, and those in the ground cover are white snakeroot, gaywings, late low blueberry, black huckleberry, grasses, mosses, and teaberry.

The depth to bedrock, the slope, the droughtiness, and small stones are the main limitations affecting most recreational development in areas of this soil. Land shaping and grading or designing the facilities so that they conform to the natural slope of the land minimizes the effects of the slope. Paths and trails should be established on a gentle grade across the slope. Water-control structures should be installed to help control surface runoff. The stones should be removed or covered with fill material that is free of stones. Maintaining a vigorously growing vegetative cover on the soil minimizes the effects of the limited depth to bedrock and the droughtiness.

This soil has very poor potential for woodland wildlife habitat and poor potential for openland wildlife habitat. Many areas support a moderate population of ruffed grouse; red, gray, and fox squirrels; and numerous other small game species. White-tailed deer and wild turkey are abundant in areas along Deer and Sitlington Creeks.

The slope and the depth to bedrock are the main limitations affecting most urban uses. This soil is not used for urban development. Areas of included soils that are less sloping and deeper to bedrock are better suited to urban development.

The capability subclass is VIIe. The woodland ordination symbol is 2R on north and south aspects.

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 these soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

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

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

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

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

Crops and Pasture

Dave Crickenberger, district conservationist, Natural Resources Conservation Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed for each soil, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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

Some general principles of management apply to all of the soils suitable for farm crops and pasture throughout the county, although individual soils or groups of soils require different kinds of management. The general principles of management are described in the following paragraphs.

Most of the soils in the county have a moderate or low supply of plant nutrients. As a result, applications of lime and fertilizer are necessary. The amounts to be applied depend on the type of soil, the cropping history, the type of crop grown, and the level of desired yields and should be determined by the results of soil tests and analyses.

The content of organic matter is low in most of the cultivated soils in the county. Increasing the content is not feasible. The content can be maintained, however, by adding farm manure, by returning crop residue to the soil, and by growing sod crops, cover crops, and green manure crops.

Tillage tends to break down soil structure and should be kept to the minimum necessary to prepare the seedbed and control weeds. Maintaining the content of organic matter in the plow layer helps to maintain soil structure.

No-till farming is becoming more common when some annual crops and new stands of grasses and legumes are established. Winter cover crops also are being included as part of no-till systems when row crops are grown. These practices help to maintain the soil structure and the content of organic matter.

Runoff and erosion occur mainly while a cultivated crop is growing or soon after it has been harvested. If cultivated, all of the gently sloping and steeper soils in the county are subject to erosion. A suitable cropping system that helps to control erosion is needed on these soils. In areas where such a system is applied, the main management needs are proper crop rotations, minimum tillage, mulch planting, crop residue management, cover crops and green manure crops, and applications of lime and fertilizer. Other major erosion-control measures are contour farming, contour stripcropping, and grassed waterways. The effectiveness of a particular combination of these measures differs from one soil to another. Different combinations can be equally effective on the same soil.

Erosion is a critical problem in the county on some of the soils commonly used for pasture. Additional management concerns that are very difficult to overcome include the slope, the large size of the individual pastured areas, low fertility, encroachment of brush, and a lack of adequate water sources in proper locations.

A high level of pasture management, including applications of fertilizer, controlled grazing, and proper selection of forage species, is needed to prevent excessive erosion on some soils. The best controlled grazing system is rotating livestock from one pasture to another and allowing for regrowth of the pasture plants. Other means of controlling grazing are varying the stocking rate according to forage production at different times in the growing season, deferring grazing to provide extra time for plant growth in areas grazed in the midsummer or fall, improving the grazing distribution in pastures by providing additional sources of water, and periodically moving the salt to areas that are undergrazed.

Generally, the quality of plant species in pastured areas varies in direct proportion to the level of management. In some situations it may be necessary to provide a seed source for better quality forage plants as the overall management level is improved. This is sometimes accomplished by feeding hay in areas where the ground cover is sparse or the species are undesirable. Frost seeding also is an option.

The composition of the plant species also can be improved by increasing the level of available plant nutrients in areas of soils that have adequate pH. Applications of phosphate in pastured areas generally result in a higher percentage of white clover. Aerial application of phosphate is the common method of improving pastures in steep areas.

The local office of the Natural Resources Conservation Service can provide information and assistance in choosing suitable practices for the management of the soils for crops and pasture.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops.

Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of the map units in this survey area is given in the section “Detailed Soil Map Units” and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 30,075 acres in the survey area, or about 5 percent of the total acreage, meets the soil requirements for prime farmland. Most areas of this land are adjacent to the major drainageways in the county.

The map units in the survey area that are considered prime farmland are listed in table 7. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Woodland Management and Productivity

Charles L. Rowan, forester, Natural Resources Conservation Service, and Harry Mahoney, timber utilization forester, Forest Service, helped to prepare this section.

Of the total 602,600 acres in the county, about 471,000 acres, or more than 78 percent of the total acreage, is used as commercial forest land. About 47,600 acres is noncommercial forest land, and the remaining 84,000 acres in the county is not forested. The noncommercial forest land, which includes State parks and the Cranberry Wilderness area, has extremely low productivity or is not available for timber harvest.

About 308,700 acres of the forest land in the county is in Monongahela National Forest. Most of this acreage is commercial forest land. In addition to the Cranberry Wilderness area, about 38,000 acres of the National forest land has been designated for semiprimitive, nonmotorized recreational activities. This acreage has not been subtracted from the total acreage of commercial forest land but cannot be considered available for commercial harvest for 10 to 15 years.

Pocahontas County has a significantly higher proportion of northern hardwoods, or maple-beech-birch type, than any other county in the state. The maple-beech-birch type is on highly productive sites, especially west of the Greenbrier River. It generally includes a significant proportion of black cherry. The oak-hickory type is in the drier areas east of the Greenbrier River. Much of the eastern part of the county originally supported large stands of high-quality eastern white pine, and many areas within the present day oak-hickory type are returning to eastern white pine through succession. The increased production of eastern white pine represents a long-term opportunity in the county. Soils at the higher elevations, generally above 3,500 feet, support an increasing amount of red spruce, either in relatively pure stands or mixed with northern hardwoods.

The main product manufactured by sawmills in the county is green lumber, which is used primarily by furniture manufacturers in North Carolina and Virginia. Lower grades of lumber are sold and used locally or in the manufacture of pallets. Some high-quality logs are sold for veneer manufactured outside the county. Four rustic fence companies within the county produce fencing, utilizing both hardwoods and softwoods, notably red spruce.

Parts of the county are within the normal procurement area of the pulp and paper mills at Covington, Virginia, and Luke, Maryland. In 1981, more than 5,000 cords of wood from Pocahontas County were sent to these mills.

In general, Pocahontas County has a major timber resource, particularly of hardwood species. The output of timber could be greatly increased on a sustained yield basis, especially through expanded use of smaller sized timber. The molding and dimension mills, which were recently built in the area, will utilize this resource. Development of drying facilities and small- or moderate-sized secondary manufacturing facilities is especially desirable to improve the contribution of forest products to the local economy. Locating a pulpwood concentration or processing yard, or both, in the western part of the county would improve the market for small-sized timber cut down when stands are thinned and for the residual material left over when sawlogs are harvested.

Tables 8 and 9 can be used by woodland owners or forest managers in planning the use of soils for wood crops. The aspects of some soils, generally those having slopes of more than 15 percent, are shown in these tables. North aspects are those that face in any compass direction from 315 degrees to 135 degrees. South aspects are those that face in any compass direction from 135 degrees to 315 degrees. A soil with north aspect generally is moister than the same soil with south aspect and commonly has a productivity rating that is one number better than that for the same soil with south aspect. For example, a Calvin soil with north aspect has an ordination symbol of 4F, while the same Calvin soil with south aspect has an ordination symbol of 3F. Aspect also affects the occurrence of tree species and the degree of management concerns.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities. The proper construction and maintenance of roads, landings, and fire lanes help to control erosion.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent. Special planting stock and special site preparation, such as bedding, furrowing, or surface drainage, reduce the seedling mortality rate.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied. Adequate site preparation before planting or soon after regeneration of the new crop helps to control plant competition.

Haul roads and skid roads ratings refer to the soil properties that affect construction, trafficability, and maintenance of roads. Haul roads lead from log landings to primary or surfaced roads. Skid roads differ from skid trails in that they are in designated locations, have repeated passes made over them, and may have limited maintenance performed on them. Slope, soil stability, wetness, rockiness, stoniness, soil strength, soil texture, depth to hard bedrock, and flooding should be considered when selecting routes. A rating of *slight* indicates no serious limitations affect construction, maintenance, season of use, or the return of the soil to forest production. A rating of *moderate* indicates some limitations affect construction. These limitations can be overcome by applying routine construction techniques. Construction and maintenance costs are higher in these areas than in areas that have only slight limitations. Returning the soil to forest production generally is more difficult. The season of use is somewhat limited in places. A rating of *severe* indicates that one or more limitations require the application of special or expensive construction techniques. Construction and maintenance costs are high, or the season of use is severely limited in places. Returning the disturbed soils to forest production is difficult or impossible. Planning routes so that the least amount of soil is disturbed during construction, building the roads on a gentle grade across the slope, providing for adequate disposal of surface water, and surfacing the roads with durable material help to overcome the limitations.

Log landings are areas where logs are assembled and loaded for transport. Areas that require little or no surface preparation or cutting and filling are the best sites for log landings. Wetness, flooding, rockiness, stoniness, rock fragments in the soil, depth to hard bedrock, soil strength, soil texture, slope, and soil stability should be considered when selecting the sites. A rating of *slight* indicates that no serious limitations affect the construction, season of use, or the return of the soil to forest production. A rating of *moderate* indicates that some limitations affect construction. These limitations can be overcome by applying proper construction techniques. Areas rated moderate generally are more difficult to return to forest production than those rated slight. A rating of *severe* indicates that some limitations require the application of special or expensive construction techniques. Construction and maintenance costs are high, or the season of use is very limited. Areas rated severe are very difficult or impossible to return to forest production. Installing diversion ditches, grading the soil so that it has a more desirable slope, and surfacing the landing with durable material help to overcome the limitations.

Operability of equipment in logging areas ratings refer to the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The areas are either partially or completely logged. The logging activities include operating a rubber-tired skidder from the stumps to the skid roads or log landings. The chief characteristics and conditions considered in the ratings are slope, slippage, soil wetness, rock outcrop, stones on the surface, texture of the surface layer, and flooding. A rating of *slight* indicates that use of equipment generally is not restricted either in kind of equipment that can be used or time of year because of soil factors. If soil wetness is a factor, the use of equipment can be restricted for a period not to exceed 3 months. A rating of *moderate* indicates that the use of equipment is moderately restricted because of one or more soil factors. If soil wetness is a factor, the use of equipment is restricted for a period of 3 to 6 months. A rating of *severe* indicates that the use of equipment is severely restricted either in kind of equipment or season of use. If soil wetness is a factor, the use of equipment is restricted for a period of more than 6 months. Using the best suited equipment and operating the equipment only when the soil is dry or frozen help to overcome the equipment limitation.

Table 9 lists the ordination symbol, which shows the potential productivity of merchantable or common trees, for those soils in the county that are suitable for wood crops. It also lists the site index and average annual growth. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The larger the number, the greater the potential productivity. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

The *potential productivity* of merchantable or *commonly grown trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Average annual growth of some of the commonly grown trees is expressed as cubic feet, board feet, and cords per acre (Schnur 1937).

The first species listed under *commonly grown trees* for a soil is the indicator species for that soil. It is the most common species on the soil and generally is the most productive species. The productivity class of the indicator species is the number for the ordination symbol.

Recreation

Norris Long, member, Pocahontas County Parks and Recreation Board, helped to prepare this section.

Pocahontas County is located within a day's travel distance of approximately one-half of the population of the United States, providing a demographic location high in potential use for recreation.

Pocahontas County is known as "the birthplace of rivers." Eight rivers have their headwaters in the county. They are the Greenbrier, Cherry, Cheat, Elk, Cranberry, Gauley, Williams, and Tygart Rivers. These major rivers, combined with their tributaries, provide for about 106 miles of warm water fishing and 224 miles of cold water fishing. There are also four lakes in the county that provide opportunities for recreational boating and fishing.

The wooded areas in the county provide habitat for a wide variety of wildlife. The large game species are white-tailed deer, black bear, and wild turkey. The major small game species include squirrels, ruffed grouse, cottontail rabbit, and snowshoe hare.

About 57 percent of the total acreage in the county is public land. The majority of this land is managed by the United States Department of Agriculture, Forest Service.

The portion of Monongahela National Forest that is in the county provides opportunities for hunting, fishing, camping, hiking, and rock climbing. It also includes scenic vistas and unique botanical areas. Areas of special interest in Monongahela National Forest include the Cranberry Glades Botanical Area, Falls of Hills Creek Scenic Area, and Gaudineer Scenic Area. The Highland Scenic Highway, a 45-mile National scenic byway, offers views of some of the most beautiful and rugged terrain in the county.

The State of West Virginia owns or controls 34,067 acres of recreational land in the county. This acreage makes up five State parks, two State forests, and the Handley Public Hunting and Fishing area. Watoga State Park is West Virginia's largest and oldest State park. Droop Mountain Battlefield State Park is the site of the largest Civil War engagement in West Virginia. Beartown State Park is an area of geologic interest and natural beauty. Cass Scenic Railroad State Park and Greenbrier River Trail State Park offer unique and varied recreational experiences. The State forests are Seneca State Forest, which is West Virginia's oldest State forest, and Calvin Price State Forest. Both offer many recreational opportunities for hiking, camping, fishing, and hunting.

Skiing is becoming an increasingly important recreational activity in the county. Three resorts in the county offer some of the most popular and challenging ski areas south of New England.

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation 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 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Gary A. Gwinn, state biologist, Natural Resources Conservation Service, and Arnold Schulz, wildlife biologist (retired), Forest Service, helped to prepared this section.

Wildlife is an important natural resource in Pocahontas County. White-tailed deer and wild turkey are common in most parts of the county. Gray squirrel, cottontail rabbit, raccoon, red and gray fox, and ruffed grouse inhabit the lower slopes of the larger valleys. They are most common east of the Greenbrier River. Black bear are most common in the remote sections of the county, such as in the Shavers Fork and Gauley Mountain areas. Beaver, mink, and muskrat inhabit areas along the headwaters of streams in the mountains and areas on bottom land along rivers, especially in the area of Dunmore. Snowshoe hare are common at the higher elevations. Woodchucks live mainly in areas that are farmed, such as the Knapp Creek area and in the vicinity of Hillsboro.

Smallmouth and rock bass, sunfish, catfish, and suckers are in the larger warm water streams. Suitable cold water streams are stocked with trout, while native brook trout inhabit many of the smaller streams.

Wildlife populations are the product of available habitat. Habitat condition is determined by such factors as land use and vegetation structure and type. These factors in turn are related to climate, topography, elevation, and soil type. Thus a relationship between existing habitat and soils can be established based upon common definitive features.

While all 10 of the general soil map units in the county support viable populations of wildlife, significant differences in species composition and numbers often exist between individual or groups of general soil map units. These differences between general soil map units and their relationship to existing habitat and associated kinds and numbers of wildlife are described in the following paragraphs.

General soil map units 1 and 2 (Potomac-Tioga-Holly and Allegheny-Atkins). These map units are characterized by broad flood plains and terraces. About 90 percent of the acreage in these units has been cleared of trees and is used for corn, small grain, hay, or pasture. These units encompass much of the high-quality openland wildlife habitat in the county. Common species include cottontail rabbit, red fox, and meadowlark.

These units also provide openland habitat for those species that prefer edge habitat situated at the wooded borders of surrounding general soil map units. Such species include white-tailed deer, ruffed grouse, raccoon, fox squirrel, mourning dove, and woodchuck.

Because the larger streams in the county flow through these units, most of the waterfowl that inhabit the county are in these units. Wood ducks and Canada geese nest in these areas, and the streams provide food and cover for wading birds. The larger streams also provide good habitat for several species of fish, including smallmouth and rock bass, catfish, and suckers.

General soil map unit 3 (Duffield-Lodi-Belmont). This map unit is characterized by its relatively vast expanse of rolling farmland. There are many sinkholes in the unit. All of the surface drains become subsurface drains before leaving the unit. About 95 percent of the unit has been cleared of trees and is used for corn, small grain, hay, or pasture.

Wildlife most common to the unit include woodchuck, fox squirrel, swallows, and bobwhite quail. Several species of cave dwellers are also in the unit, including various species of bats and the cave salamander.

General soil map unit 4 (Cateache-Shouns-Belmont). This map unit is characterized by gently sloping to extremely steep mountainous uplands. About 75 percent of the unit is covered with trees. The remainder is covered with grasses and legumes. The forest species consist of northern hardwoods, black locust, black walnut, and shagbark hickory. Some of the shrubs and vines are wild grape, camphorvine, dogwood, serviceberry, rhododendron, elderberry, and hawthorn. The herbaceous plants include stinging nettle, ramps, snakeroot, jewelweed, and columbine. The unit provides habitat for a wide variety of species. It supports good populations of white-tailed deer, wild turkey, ruffed grouse, and black bear and provides habitat for a variety of wood warblers and other songbirds.

General soil map unit 5 (Blackthorn-Faywood-Berks). This map unit is characterized by rolling hills that grade into low, sharp ridges and very steep side slopes. About 45 percent of the unit is covered with trees, mostly oaks, hickories, and eastern white pine. Some of the shrubs and vines are mountain laurel, rhododendron, huckleberry, dogwood, wild grape, and greenbrier. The herbaceous plants include grasses, ferns, and thistles. The cleared areas are mainly used for pasture or hay. A small acreage is used for corn.

This unit provides excellent edge habitat for white-tailed deer and ruffed grouse. It also supports good populations of cottontail rabbit and gray and fox squirrels.

General soil map units 6, 7, and 8 (Calvin-Shouns, Berks-Weikert, and Dekalb-Calvin-Mertz-Elliber). These map units are mainly characterized by steep mountainous slopes and sloping ridgetops. They are east of the Greenbrier River. About 90 percent of the acreage in these units is used as woodland, which is dominated by oaks, hickories, and eastern white pine. The shrubs and vines in these areas are mountain laurel, rhododendron, huckleberry, dogwood, greenbrier, wild grape, witch hazel, and honeysuckle. The herbaceous plants include grasses, ferns, yarrow, and mayapple. While not producing rapid vegetative growth, these units produce good mast crops when the stands are fully stocked with mature trees. They provide good or excellent habitat for those species, such as gray squirrel and wild turkey, that are dependent on hard mast crops. Most of the acreage of openland in the units is used as pasture.

General soil map unit 9 (Mandy-Snowdog-Gauley). This map unit is characterized by a high plateau that has broad ridgetops and steep side slopes. It generally is at elevations of more than

4,000 feet. About 95 percent of the acreage in the unit is wooded with red spruce and northern hardwoods. Heath barrens that are dominated by blueberries and rhododendron are in scattered areas throughout the unit. The shrub community consists of mountain ash, mountain holly, mountain maple, and hobblebush. The herbaceous plants include ferns, grasses, and sorrels.

Because of the climate and vegetation associated with this map unit, the population of such game species as white-tailed deer, wild turkey, and gray squirrel is limited. The remoteness of the unit, however, enhances its use by such species as black bear and mountain lion. Open areas of Briery and associated soils, which are minor soils in the unit, enhance wildlife diversity. The unique vegetation in this unit provides habitat for endemic species, such as snowshoe hare and northern flying squirrel.

General soil map unit 10 (Mandy). This map unit is characterized by a highly dissected landscape. About 90 percent of the acreage in this unit is forested. The forest is dominantly made up of American beech but also includes maples, yellow birch, and black cherry. The shrub community consists of striped maple and rhododendron. The herbaceous plants include ferns, grasses, and sorrels.

Because of the lack of diverse vegetation, the population of such game species as white-tailed deer, wild turkey, and gray squirrel is limited. The remoteness of the region, however, enhances its use by species such as black bear.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In this report individual soils are rated in accordance with their inherent capability to produce certain key habitat elements. Specific areas of soil are not evaluated as to existing vegetative conditions which in turn determine the present carrying capacity for wildlife on a site. Current habitat conditions at a specific site may be excellent for a given species of wildlife even though the soil at that site may rate poor for production of suitable habitat due to the length of time vegetation has been allowed to develop on the site.

In table 11, the soils in the survey area are rated in relative terms and existing habitat is disregarded. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and 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, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggartick, quackgrass, ragweed, foxtail, wild carrot, and panic grass.

Hardwood trees and shrubs 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, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood 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, cedar, and hemlock.

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, arrowhead, bur reed, pickerelweed, cutgrass, rushes, sedges, and cattails.

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, swamps, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

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, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, and tree swallow.

Engineering

Michael M. Blaine, state conservation engineer, Natural Resources Conservation Service, helped to prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 13 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place (fig. 9). 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

Figure 9.—A chert pit in an area of Elliber extremely channery silt loam, 35 to 55 percent slopes. This material is used mainly in the construction of roads.

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 nutrients for plant growth.

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect 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 even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

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 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

The table gives the *frequency of flooding*. Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is estimated and generally is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched, apparent, or artesian; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. 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.

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 either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA 1975). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 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; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Ultic* identifies the subgroup that intergrades to the Ultisol order. An example is Ultic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Ultic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

Dr. John Sencindiver, professor of agronomy, West Virginia Agricultural and Forestry Experiment Station, helped to prepare this section.

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA 1975) and in “Keys to Soil Taxonomy” (USDA 1992). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section “Detailed Soil Map Units.”

Allegheny Series

The Allegheny series consists of very deep, well drained soils that formed in loamy alluvium derived mainly from acid sandstone, siltstone, and shale. These soils are on stream terraces, foot slopes, and alluvial fans. They generally are in the Green Bank area but also are along the major streams. Slope ranges from 3 to 15 percent.

Allegheny soils are on the landscape with the well drained Chavies and Weikert soils and the poorly drained Purdy soils. Unlike Allegheny soils, Chavies soils are subject to flooding. Allegheny soils are deeper than the Weikert soils and have less clay in the subsoil than the Purdy soils.

Typical pedon of Allegheny loam, 3 to 8 percent slopes, in a grassy area on the campus of the Green Bank Elementary/Middle School; about 800 feet north, 75 degrees west of the intersection of West Virginia Routes 28 and 92 and Hosterman Road:

Ap—0 to 8 inches; dark brown (10YR 4/3) loam; moderate fine and medium granular structure; friable; common very fine and fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1—8 to 21 inches; dark yellowish brown (10YR 4/6) loam; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; few faint clay films in pores; 10 percent rock fragments; strongly acid; clear smooth boundary.

Bt2—21 to 30 inches; dark yellowish brown (10YR 4/6) gravelly silt loam; moderate medium subangular blocky structure; firm; few very fine roots; few distinct clay films on faces of peds, on rock fragments, and in pores; 15 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt3—30 to 34 inches; strong brown (7.5YR 4/6) gravelly loam; weak fine and medium subangular blocky structure; friable; few distinct clay films on faces of peds, on rock fragments, and in pores; 30 percent rock fragments; very strongly acid; clear wavy boundary.

BC—34 to 40 inches; dark brown (7.5YR 4/4) very gravelly fine sandy loam; weak fine and medium subangular blocky structure; loose; 35 percent rock fragments; very strongly acid; clear wavy boundary.

2C—40 to 65 inches; strong brown (7.5YR 4/6) extremely gravelly fine sandy loam; massive; loose; 80 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 30 to 55 inches. The depth to bedrock is more than 60 inches. The content of pebbles and cobbles ranges, by volume, from 0 to 15 percent in the A horizon, from 0 to 30 percent in the Bt horizon, from 0 to 35 percent in the BC horizon and the part of the 2C horizon above a depth of 40 inches, and from 30 to 80 percent in the part of the 2C horizon below a depth of 40 inches. The pebbles and cobbles are dominantly sandstone. In unlimed areas reaction is extremely acid to strongly acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 to 8. In some pedons the entire horizon is mottled in shades of brown, red, or yellow and the lower part of the horizon below the upper 24 inches is mottled in shades of gray or olive. The texture of the fine-earth material is clay loam, loam, silt loam, or silty clay loam.

The BC horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 to 8. Some pedons have mottles in shades of brown, red, yellow, gray, or olive. The texture of the fine-earth material is fine sandy loam, loam, or clay loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 3 to 8. Some pedons have mottles in shades of brown, gray, yellow, or olive. The texture of the fine-earth material is fine sandy loam, loam, or clay loam.

Atkins Series

The Atkins series consists of very deep, poorly drained soils that formed in alluvial material derived mainly from acid soils underlain by shale, siltstone, or sandstone. The Atkins soils are on the flood plains of the Southern Ridge and Valley physiographic province in the Deer Creek watershed. They are subject to frequent flooding. Slope ranges from 0 to 3 percent.

Atkins soils are on the landscape with the moderately well drained Philo soils and the poorly drained Purdy soils. Atkins soils are flooded more frequently than the Philo soils and have less clay in the subsoil than the Purdy soils.

Typical pedon of Atkins silt loam in a meadow; about 2,000 feet north, 50 degrees west of the intersection of West Virginia Routes 28 and 92 and Lambert Road, 75 feet south of Brush Run, about 1.2 miles north of Boyer:

A—0 to 4 inches; dark yellowish brown (10YR 4/4) silt loam; common fine prominent olive gray (5Y 5/2) mottles; weak very fine and fine granular structure; friable; common very fine and fine and many medium roots; strongly acid; clear wavy boundary.

Bg1—4 to 11 inches; olive gray (5Y 5/2) silt loam; common fine and medium prominent dark yellowish brown (10YR 4/6) and yellowish brown

(10YR 5/8) mottles; weak fine subangular blocky structure; friable; few very fine and medium roots; 2 percent rock fragments; strongly acid; abrupt smooth boundary.

Bg2—11 to 25 inches; light olive gray (5Y 6/2) silt loam; many medium and coarse distinct light brownish gray (2.5Y 6/3) and common fine and medium prominent yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable, sticky; few very fine and common medium roots; 2 percent rock fragments; very strongly acid; clear smooth boundary.

Cg1—25 to 33 inches; gray (N 6/0) silt loam; common fine and medium distinct light yellowish brown (2.5Y 6/4), common medium prominent dark yellowish brown (10YR 4/6), and common medium prominent yellowish brown (10YR 5/8) mottles; massive; friable, sticky; few very fine and fine and common medium roots; 2 percent rock fragments; very strongly acid; clear smooth boundary.

Cg2—33 to 65 inches; gray (N 5/0) very gravelly silt loam; common coarse prominent yellowish brown (10YR 5/8) mottles; massive; firm, sticky; few fine and common medium roots; 40 percent rock fragments; strongly acid.

The thickness of the solum ranges from 25 to 44 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges, by volume, from 0 to 5 percent in the solum and from 0 to 40 percent in the substratum. In unlimed areas reaction is very strongly acid or strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4.

The B horizon has hue of 2.5Y or 5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 2. Mottles have hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 8. The texture of the fine-earth material is silt loam, loam, or silty clay loam.

The C horizon has hue of 10YR, 2.5Y, or 5Y or is neutral. It has value of 4 to 7 and chroma of 0 to 2. Mottles have hue of 10YR or 2.5YR, value of 3 to 6, and chroma of 2 to 8. The texture of the fine-earth material is silt loam, loam, or silty clay loam.

Belmont Series

The Belmont series consists of deep, well drained soils that formed in material weathered from limestone interbedded with some shale, siltstone, or sandstone. These soils are on benches and side slopes in areas of the Greenbrier geologic deposits. They are mainly west of the Greenbrier River but also are in an area near the head of the East Fork of the Greenbrier River. Slope ranges from 3 to 55 percent.

Belmont soils are on the landscape with the well drained Cateache, Culleoka, Duffield, Lodi, and Shouns soils and the moderately well drained Sees soils. Belmont soils are deeper and have a lower content of rock fragments in the profile than the Cateache and Culleoka soils. They have less clay in the subsoil and are not so deep as the Lodi and Sees soils. Belmont soils are less acid in the lower part of the profile than the Duffield soils. They are not so deep as the Shouns soils, which formed in local alluvium or colluvium.

Typical pedon of Belmont silt loam, 35 to 55 percent slopes, very rocky, in a pastured area; about 1,500 feet north, 60 degrees west of the intersection of Back Mountain Road and Nottingham Road:

Oi—1.5 inches to 0; slightly decomposed grass.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium granular structure; friable; many very fine and fine and common medium roots; 5 percent rock fragments; moderately acid; clear smooth boundary.

BA—3 to 6 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; many very fine and fine and common medium roots; 10 percent rock fragments; moderately acid; clear wavy boundary.

Bt1—6 to 12 inches; dark brown (7.5YR 4/4) channery silt loam; moderate fine and medium subangular blocky structure; friable; common very fine and fine and few medium roots; common distinct clay films on faces of peds, on rock fragments, and in pores and root channels; 15 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—12 to 23 inches; dark brown (7.5YR 4/4) channery silty clay loam; moderate fine and medium subangular blocky structure; friable; few medium roots; many prominent clay films on faces of peds, on rock fragments, and in pores and root channels; 15 percent rock fragments; slightly acid; clear wavy boundary.

Bt3—23 to 35 inches; dark brown (7.5YR 4/4) channery silty clay; strong medium and coarse subangular blocky structure; firm, sticky and plastic; few medium roots; many prominent clay films on faces of peds, on rock fragments, and in pores and root channels; 20 percent rock fragments; slightly acid; gradual wavy boundary.

C—35 to 51 inches; dark brown (7.5YR 4/4) very channery silty clay; massive; firm, sticky and plastic; 45 percent rock fragments; slightly alkaline; abrupt irregular boundary.

R—51 inches; gray (N 5/0) limestone bedrock interbedded with dark grayish brown (2.5Y 4/2) siltstone bedrock.

The thickness of the solum ranges from 30 to 40 inches. The depth to bedrock ranges from 40 to 60 inches. The content of limestone, shale, siltstone, and sandstone fragments ranges, by volume, from 0 to 5 percent in the A horizon, from 0 to 20 percent in the B horizon, and from 20 to 45 percent in the C horizon. In unlimed areas reaction is strongly acid to slightly acid in the A horizon and in the upper part of the B horizon, moderately acid to neutral in the lower part of the B horizon, and moderately acid to slightly alkaline in the C horizon.

The A horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3.

The BA horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 4. The texture of the fine-earth material is silt loam or silty clay loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine-earth material is silt loam, silty clay loam, or silty clay.

The C horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine-earth material is silty clay or silty clay loam.

Berks Series

The Berks series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded siltstone, shale, or fine grained sandstone (fig. 10). These soils are on uplands in the eastern half of the county, mainly in areas of the Chemung, Hampshire, Pocono, Brallier, and Millboro Shale geologic deposits. Slope ranges from 3 to 80 percent.

Berks soils are on the landscape with the well drained Blackthorn, Calvin, Dekalb, Faywood, Lily, Macove, Mertz, and Weikert soils and the moderately well drained Blairton soils. Berks soils are not so deep as the Blackthorn, Macove, and Mertz soils; do not have the red color that is typical of the Calvin soils; have less sand in the subsoil than the Dekalb soils; have less clay and more rock fragments in the subsoil than the Faywood, Lily, and Blairton soils; and are deeper than the Weikert soils.

Typical pedon of Berks channery silt loam, 35 to 55 percent slopes, very stony, in a wooded area; about 1.5 miles south, 87 degrees east of the Pocahontas Picnic and Campground area, near the head of Big Sandy Run:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 2 inches; dark brown (10YR 4/3) channery silt loam; weak very fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 15 percent rock fragments; very strongly acid; abrupt smooth boundary.

BA—2 to 4 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine subangular blocky structure; very friable; many very fine, fine, medium, and coarse roots; 20 percent rock fragments; very strongly acid; abrupt smooth boundary.

Bw1—4 to 13 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine subangular blocky structure; friable; common fine, medium, and coarse roots; 40 percent rock fragments; very strongly acid; clear smooth boundary.

Bw2—13 to 22 inches; yellowish brown (10YR 5/6) very channery silt loam; moderate fine and medium subangular blocky structure; friable; common fine, medium, and coarse roots; 50 percent rock fragments; very strongly acid; clear wavy boundary.

C—22 to 31 inches; yellowish brown (10YR 5/8) extremely channery silt loam that has pockets of yellowish brown (10YR 5/6), light brownish gray (2.5Y 6/2), strong brown (7.5YR 5/8), and yellowish red (5YR 5/8) channery silt loam; massive; friable; few very fine, fine, medium, and coarse roots; 65 percent rock fragments; extremely acid; clear irregular boundary.

Cr—31 inches; highly weathered, olive (5Y 4/3) siltstone bedrock.

The thickness of the solum ranges from 18 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. The content of siltstone, shale, and fine grained sandstone fragments ranges, by volume, from 15 to 40 percent in the A horizon, from 15 to 60 percent in the B horizon, and from 55 to 75 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The B horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

Blackthorn Series

The Blackthorn series consists of very deep, well drained soils that formed in colluvial material derived from acid sandstone and shale and in the underlying material weathered from limestone and limy shale. These soils are on gently sloping to very steep foot slopes and benches in areas of the Helderberg, Cayugan, and McKenzie geologic deposits. Slope ranges from 3 to 55 percent.

Blackthorn soils are on the landscape with the well drained Berks, Calvin, Dekalb, Faywood, and Hazleton soils. Blackthorn soils are deeper than the other soils. They also have less clay and more rock fragments in the upper part of the profile than the Faywood soils.

Typical pedon of Blackthorn channery loam, 15 to 35 percent slopes, extremely stony, in a wooded area of Calvin Price State Forest; about 1.6 miles south, 60 degrees east of the intersection of County Route 21 and the south entrance to Watoga State Park:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

Oa—0 to 1 inch; highly decomposed forest litter.

A—1 to 5 inches; dark brown (10YR 3/3) channery loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—5 to 10 inches; brown (10YR 5/3) very channery loam; weak fine subangular blocky structure parting to weak fine granular; very friable; many very fine, fine, medium, and coarse roots; 40 percent rock fragments; strongly acid; clear wavy boundary.

BE—10 to 18 inches; yellowish brown (10YR 5/4) very channery loam; weak fine and medium subangular blocky structure; very friable; many very fine, fine, medium, and coarse roots; 35 percent rock fragments; moderately acid; gradual wavy boundary.

Bw—18 to 24 inches; yellowish brown (10YR 5/4) very channery sandy loam; weak fine and medium subangular blocky structure; very friable; common fine and medium roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—24 to 39 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak fine and medium subangular blocky structure; friable; few fine and medium roots; common prominent clay films on faces of peds, on rock fragments, and in pores; 50 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt2—39 to 51 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; few prominent clay films on faces of peds, on rock fragments, and in pores; 60 percent rock fragments; very strongly acid; clear wavy boundary.

2Bt3—51 to 65 inches; strong brown (7.5YR 5/8) silty clay; common fine and medium prominent yellow (2.5Y 7/6) lithochromic mottles; common prominent brownish yellow (10YR 6/6) and yellowish red (5YR 5/6) coatings; weak medium subangular blocky structure; friable; few very fine and fine roots; common distinct clay films on faces of peds and in pores; 10 percent rock fragments; very strongly acid.

The thickness of the solum and the depth to bedrock are more than 60 inches. Depth to the 2Bt horizon ranges from 42 to 55 inches. The content of rock fragments ranges, by volume, from 5 to 45 percent in the A and E horizons, from 20 to 60 percent in the B horizon, and from 10 to 25 percent in the 2Bt horizon. The rock fragments are dominantly sandstone, but some are cherty limestone. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is very strongly acid to moderately acid above the 2Bt horizon and very strongly acid or strongly acid in the 2Bt horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5, and chroma of 2 or 3. The texture of the fine-earth material is sandy loam or loam.

The BE horizon has hue of 10YR, value of 5, and chroma of 3 or 4. The texture of the fine-earth material is sandy loam or loam.

The Bw and Bt horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. The texture of the fine-earth material is sandy loam or loam.

The 2Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 6 to 8. The texture of the fine-earth material is silty clay loam or silty clay.

Blairton Series

The Blairton series consists of moderately deep, moderately well drained soils that formed in material weathered from shale, sandstone, or siltstone. These soils are on upland flats, in depressions, and at the head of drainageways, mainly in areas of the Bluefield, Hinton, and Clinton geologic deposits. Slope ranges from 3 to 8 percent.

Blairton soils are on the landscape with the well drained Berks and Dekalb soils. Blairton soils have fewer rock fragments and more clay in the subsoil than the Berks and Dekalb soils.

Typical pedon of Blairton silt loam, 3 to 8 percent slopes, in a pastured area; about 2,400 feet north, 22 degrees east of the intersection of County Routes 17/1 and 17/2, northwest of Woodrow:

A—0 to 2 inches; dark brown (10YR 3/3) silt loam; moderate very fine and fine granular structure; friable; many very fine and fine roots; 5 percent rock fragments; slightly acid; abrupt wavy boundary.

BA—2 to 5 inches; dark yellowish brown (10YR 4/6) silt loam; moderate fine subangular blocky structure parting to weak fine granular; friable; common very fine and fine roots; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—5 to 13 inches; yellowish brown (10YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; few very fine and fine roots; few faint clay films on faces of peds and in pores; 5 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—13 to 19 inches; light olive brown (2.5Y 5/6) silty clay loam; few fine and medium distinct grayish brown (2.5Y 5/2) and light olive brown (2.5Y 5/4) and few fine and medium prominent strong brown (7.5YR 5/8) mottles; moderate medium and coarse subangular blocky structure; friable; few very fine and fine roots; few distinct clay films on faces of peds and in pores; 10 percent rock fragments; extremely acid; clear wavy boundary.

BC—19 to 24 inches; light olive brown (2.5Y 5/4) very channery silty clay loam; common medium and coarse distinct grayish brown (2.5Y 5/2) and common medium and coarse prominent strong brown (7.5YR 5/6) mottles; moderate medium platy structure parting to weak very fine subangular blocky; friable; 45 percent rock fragments; extremely acid; clear smooth boundary.

C—24 to 34 inches; mixed dark grayish brown (2.5Y 4/2), light olive brown (2.5Y 5/4), and strong brown (7.5YR 5/8) extremely channery silt loam; massive; friable; 75 percent rock fragments; extremely acid; clear wavy boundary.

Cr—34 inches; highly weathered siltstone and fine grained sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of shale, sandstone, and siltstone fragments ranges, by volume, from 0 to 30 percent in the A horizon, from 5 to 30 percent in the Bt horizon, and from 15 to 75 percent in the BC and C horizons. In unlimed areas reaction is extremely acid or very strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The BA, Bt, and BC horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 8. The texture of the fine-earth material is silt loam, loam, or silty clay loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 2 to 8. The texture of the fine-earth material is silt loam or loam.

Briery Series

The Briery series consists of very deep, well drained soils that formed in partly weathered shale, siltstone, and sandstone and in some coal from surface-mined coal seams (fig. 11). These soils are on uplands at elevations of more than 3,500 feet in areas of the New River geologic deposits. Slope ranges from 0 to 80 percent.

Briery soils are on the landscape with the well drained Gauley and Mandy soils, the moderately well drained Snowdog soils, and the somewhat poorly drained Leatherbark soils. Briery soils are deeper than the Gauley, Mandy, and Leatherbark soils. They do not have the fragipan that is characteristic of the Snowdog soils. They have more rock fragments in the profile than the Leatherbark and Snowdog soils.

Typical pedon of Briery very channery silt loam in an area of Briery-Rock outcrop complex, very steep, on a bench revegetated with crownvetch, birdsfoot trefoil, and orchardgrass; about 4.5 miles south, 45 degrees west of Sharp Knob on Gauley Mountain:

A—0 to 2 inches; very dark grayish brown (10YR 3/2) very channery silt loam; weak very fine granular structure; very friable; many very fine, fine, and medium roots; 45 percent rock fragments; moderately acid; abrupt smooth boundary.

C1—2 to 21 inches; dark brown (10YR 4/3) very channery silt loam; common distinct strong brown (7.5YR 5/8) and prominent gray (10YR 5/1) lithochromic mottles; massive; friable; few fine and medium roots; 55 percent rock fragments; neutral; gradual irregular boundary.

C2—21 to 65 inches; dark brown (10YR 4/3) extremely channery silty clay loam; massive; friable; few very fine and fine roots; 75 percent rock fragments; slightly alkaline.

The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 15 to 85 percent throughout the profile. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. The rock fragments are siltstone, shale, sandstone, or coal, and the percentage of each is less than 65 percent, by volume, of the total rock fragments in the control section. The fragments are dominantly channers, but some are stones and a few are boulders. The content of clay in the control section ranges from 18 to 35 percent. Some pedons have red or yellow lithochromic mottles in the C horizon. In unlimed areas reaction is strongly acid to slightly alkaline.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 3.

The C horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. The texture of the fine-earth material is silt loam, silty clay loam, or loam.

Calvin Series

The Calvin series consists of moderately deep, well drained soils that formed in material weathered from shale, siltstone, or fine grained sandstone (fig. 12). These soils are on ridgetops, benches, and side slopes in areas of the Hampshire geologic deposits. They are mainly in areas of the Greenbrier River and in some areas on Burner and Allegheny Mountains. Slope ranges from 3 to 80 percent.

Calvin soils are on the landscape with the well drained Berks, Blackthorn, Dekalb, and Shouns soils. Calvin soils are shallower and have less clay in the subsoil than the Blackthorn and Shouns soils. They are redder than the Berks and Dekalb soils and have less sand in the subsoil than the Dekalb soils.

Typical pedon of Calvin channery silt loam, 35 to 55 percent slopes, very stony, in a wooded area; about 1.5 miles south, 77 degrees east of the junction of County Route 39/2 and Stillhouse Run:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 2 inches; dark reddish brown (5YR 3/2) channery silt loam; weak very fine granular structure; very friable; many very fine, fine, and medium roots; 25 percent rock fragments; very strongly acid; abrupt smooth boundary.

BA—2 to 4 inches; reddish brown (5YR 4/3) silt loam; weak fine subangular blocky structure parting to weak very fine granular; very friable; many very fine, fine, medium, and coarse roots; 10 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bw1—4 to 13 inches; reddish brown (5YR 4/4) channery silt loam; weak fine and medium subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; 25 percent rock fragments; very strongly acid; clear smooth boundary.

Bw2—13 to 21 inches; reddish brown (5YR 4/4) channery silt loam; moderate medium subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; 25 percent rock fragments; very strongly acid; clear wavy boundary.

BC—21 to 27 inches; reddish brown (5YR 4/4) very channery silt loam; moderate medium subangular blocky structure; friable; few very fine, fine, and medium roots; 55 percent rock fragments; very strongly acid; gradual wavy boundary.

C—27 to 39 inches; reddish brown (5YR 4/4) extremely channery silt loam; massive; firm; few very fine, fine, and medium roots; 65 percent rock fragments; very strongly acid; clear smooth boundary.

Cr—39 inches; reddish brown (5YR 4/3), highly weathered siltstone bedrock.

The thickness of the solum ranges from 20 to 32 inches. The depth to bedrock ranges from 20 to 40 inches. The content of shale, siltstone, and fine grained sandstone fragments ranges, by volume, from 5 to 25 percent in the A and BA horizons, from 25 to 55 percent in the Bw and BC horizons, and from 55 to 70 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is very strongly acid or strongly acid.

The A horizon has hue of 5YR or 7.5YR, value of 2 to 5, and chroma of 2 to 4.

The BA horizon has hue of 5YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine-earth material is loam or silt loam.

The Bw and BC horizons have hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 to 6. The texture of the fine-earth material is loam or silt loam.

The C horizon has hue of 2.5YR or 5YR and value and chroma of 3 or 4. The texture of the fine-earth material is loam or silt loam.

Cateache Series

The Cateache series consists of moderately deep, well drained soils that formed in material weathered from calcareous siltstone, shale, or fine grained sandstone (fig. 13). These soils are on ridgetops, benches, and side slopes west of the Greenbrier River and in an area near the head of the East Fork of the Greenbrier River. They mainly are in areas of the Maccrady, Bluefield, and Hinton geologic deposits. Slope ranges from 3 to 80 percent.

Cateache soils are near Belmont, Culleoka, Duffield, Lily, Mandy, and Shouns soils. Cateache soils are shallower and have more rock fragments in the profile than the Belmont, Duffield, and Shouns soils. They are redder than the Culleoka, Lily, and Mandy soils. They have a mesic soil temperature regime, while Mandy soils have a frigid soil temperature regime.

Typical pedon of Cateache channery silt loam, 35 to 55 percent slopes, very stony, in a wooded area; about

1.25 miles northwest of the confluence of the East Fork and the West Fork of the Greenbrier River:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 2 inches; very dark brown (10YR 2/2) channery silt loam; weak fine and medium granular structure; very friable; many fine, medium, and coarse roots; 20 percent rock fragments; very strongly acid; abrupt wavy boundary.

BA—2 to 6 inches; dark reddish brown (5YR 3/4) channery silt loam; weak fine and medium subangular blocky structure; friable; many fine, medium, and coarse roots; 15 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—6 to 22 inches; reddish brown (5YR 4/4) channery silty clay loam; moderate fine and medium subangular blocky structure; friable; many fine, medium, and coarse roots; common distinct clay films on faces of peds, on rock fragments, and in pores; 25 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—22 to 28 inches; reddish brown (5YR 4/4) very channery silty clay loam; weak fine and medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds, on rock fragments, and in pores; 45 percent rock fragments; very strongly acid; clear wavy boundary.

C—28 to 32 inches; reddish brown (2.5YR 4/4) extremely channery silty clay loam; massive; firm; few fine roots; 80 percent rock fragments; strongly acid; clear wavy boundary.

Cr—32 inches; dark reddish brown (2.5YR 3/4), fractured siltstone bedrock.

The thickness of the solum ranges from 18 to 40 inches. The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments ranges, by volume, from 5 to 25 percent in the A and BA horizons, from 10 to 50 percent in the Bt horizon, and from 35 to 80 percent in the C horizon. The content of rock fragments in the upper 20 inches of the Bt horizon ranges, by volume, from 15 to 35 percent. The rock fragments are mostly channers of siltstone, but some are shale or fine grained sandstone. In unlimed areas reaction is very strongly acid to moderately acid in the A and B horizons and strongly acid or moderately acid in the C horizon.

The A horizon has hue of 5YR, 7.5YR, or 10YR, value of 2 or 3, and chroma of 2.

The BA horizon has hue of 5YR, value of 3 or 4, and chroma of 2 to 4. The texture of the fine-earth material is silt loam or loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 to 6. The texture of the fine-earth material is silt loam or silty clay loam.

The C horizon has hue of 10R, 2.5YR, or 5YR and value and chroma of 3 or 4. The texture of the fine-earth material is silt loam or silty clay loam.

Chavies Series

The Chavies series consists of very deep, well drained soils that formed in alluvium derived mainly from soils underlain by sandstone or siltstone or, in some places, by limestone. The Chavies soils are on low stream terraces along the Greenbrier River and its larger tributaries. They are subject to rare flooding. Slope ranges from 0 to 3 percent.

Chavies soils are on the landscape with the well drained Allegheny, Sensabaugh, and Tioga soils, the moderately well drained Lobdell soils, the somewhat poorly drained Orrville soils, and the poorly drained Holly and Purdy soils. Chavies soils are subject to flooding, whereas the Allegheny soils are not. Chavies soils are flooded less frequently than the Sensabaugh, Tioga, Lobdell, Orrville, and Holly soils. They have less clay in the subsoil than the Purdy soils.

Typical pedon of Chavies fine sandy loam in a meadow; about 1.4 miles south, 64 degrees east of the intersection of U.S. Route 219 and the Airport Road:

Ap—0 to 8 inches; dark yellowish brown (10YR 3/4) fine sandy loam; moderate fine subangular blocky structure parting to moderate medium granular; friable; many very fine, fine, and medium roots; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Bt1—8 to 14 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; many very fine and fine roots; few faint clay films on faces of peds and in pores; 10 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—14 to 33 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; few very fine and fine roots; few faint clay films on faces of peds and in pores; 5 percent rock fragments; moderately acid; clear wavy boundary.

BC—33 to 41 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; 5 percent rock fragments; moderately acid; gradual wavy boundary.

C—41 to 65 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; massive; firm; 25 percent rock fragments; strongly acid.

The thickness of the solum ranges from 30 to 50 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 15 percent in the solum and from 0 to 30 percent in the substratum. The rock fragments are dominantly sandstone pebbles. In unlimed areas reaction is very strongly acid to neutral in the A and Bt horizons and very strongly acid to moderately acid in the BC and C horizons.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The Bt and BC horizons have hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 to 6. The texture of the fine-earth material is fine sandy loam, loam, or silt loam.

The C horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 3 to 6. The texture of the fine-earth material is fine sandy loam, loam, or silt loam.

Culleoka Series

The Culleoka series consists of moderately deep, well drained soils that formed in material weathered from calcareous siltstone, shale, or fine grained sandstone. These soils are on ridgetops, benches, and side slopes west of the Greenbrier River in areas of the Greenbrier and Bluefield geologic deposits. Slope ranges from 3 to 55 percent.

Culleoka soils are on the landscape with the well drained Belmont and Cateache soils. Culleoka soils are not so deep and have more rock fragments in the profile than the Belmont soils. They are yellower than the Cateache soils.

Typical pedon of Culleoka silt loam, 35 to 55 percent slopes, in a wooded area; about 2,600 feet north, 20 degrees east of the intersection of County Routes 29 and 29/5, north of Jacox:

Oi—3 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 1 inch; very dark grayish brown (10YR 3/2) silt loam; weak very fine and fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 10 percent rock fragments; strongly acid; abrupt wavy boundary.

BA—1 to 3 inches; dark brown (10YR 4/3) channery silt loam; weak fine subangular blocky structure parting to weak fine granular; very friable; many very fine, fine, medium, and coarse roots; 15 percent rock fragments; strongly acid; abrupt wavy boundary.

Bt1—3 to 9 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine and medium subangular blocky structure; friable; many very fine, fine, medium, and coarse roots; few faint clay films on rock fragments and in pores; 15 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—9 to 17 inches; strong brown (7.5YR 4/6) channery silt loam; moderate fine and medium subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; few distinct clay films on faces of peds, on rock fragments, and in pores; 30 percent rock fragments; strongly acid; clear irregular boundary.

BC—17 to 21 inches; brown (7.5YR 5/4) very channery silt loam; moderate fine subangular blocky structure; friable; few fine and medium roots; 35 percent rock fragments; strongly acid; clear smooth boundary.

C—21 to 33 inches; yellowish brown (10YR 5/4) extremely channery silt loam; massive; friable; few fine and medium roots; 75 percent rock fragments; strongly acid; gradual wavy boundary.

R—33 inches; olive brown (2.5YR 4/4), fine grained sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The rock fragments are dominantly siltstone, but some are shale or fine grained sandstone. The content of rock fragments ranges, by volume, from 0 to 20 percent in the A horizon, from 10 to 35 percent in the B horizon, and from 25 to 80 percent in the C horizon. In unlimed areas reaction is strongly acid or moderately acid in the A and B horizons and strongly acid in the C horizon.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The BA, Bt, and BC horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The texture of the fine-earth material is silt loam or silty clay loam.

The C horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The texture of the fine-earth material is silt loam or silty clay loam.

Dekalb Series

The Dekalb series consists of moderately deep, well drained soils that formed in acid material weathered from sandstone. These soils are on uplands in the eastern half of the county, mainly in areas of the Hampshire, Pocono, and Oriskany geologic deposits. Slope ranges from 3 to 55 percent.

Dekalb soils are on the landscape with the well drained Berks, Blackthorn, Calvin, Elliber, Hazleton, Lily, and Macove soils and the moderately well drained

Blairton soils. Dekalb soils contain more sand in the subsoil than the other soils; do not have the colors that are typical of the Calvin soils; are not so deep as the Blackthorn, Elliber, and Macove soils; and have more rock fragments in the profile than the Blairton and Lily soils.

Typical pedon of Dekalb channery loam in a wooded area of Berks-Dekalb complex, 35 to 55 percent slopes, very stony; about 1 mile south, 43 degrees east of the intersection of U.S. Route 219 and Seebert Road:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) channery loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 20 percent rock fragments; strongly acid; abrupt wavy boundary.

Bw—4 to 17 inches; yellowish brown (10YR 5/4) very channery loam; weak fine and medium subangular blocky structure; friable; common fine, medium, and coarse roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

BC—17 to 26 inches; yellowish brown (10YR 5/6) very channery loam; weak medium subangular blocky structure; friable; few fine, medium, and coarse roots; 55 percent rock fragments; very strongly acid; clear wavy boundary.

C—26 to 36 inches; brownish yellow (10YR 6/6) very channery sandy loam; massive; friable; few fine, medium, and coarse roots; 60 percent rock fragments; strongly acid; clear wavy boundary.

R—36 inches; yellowish brown (10YR 5/6), massive sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of sandstone fragments ranges, by volume, from 10 to 30 percent in the A horizon, from 10 to 60 percent in the B horizon, and from 50 to 90 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The Bw and BC horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is loam, fine sandy loam, or sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. The texture of the fine-earth material is sandy loam or loamy sand.

Duffield Series

The Duffield series consists of deep, well drained soils that formed in material weathered from interbedded limestone, siltstone, or chert. These soils are on gently sloping to strongly sloping uplands from Beard Heights south to the county line. They are in areas of the lower Greenbrier geologic deposits. Slope ranges from 3 to 15 percent.

Duffield soils are on the landscape with the well drained Belmont, Cateache, Lodi, and Shouns soils and the moderately well drained Sees soils. Duffield soils are more acid in the lower part of the profile than the Belmont soils, are deeper and have a lower content of rock fragments in the profile than the Cateache soils, have less clay in the subsoil than the Lodi and Sees soils, and are not so red in the subsoil as the Shouns soils.

Typical pedon of Duffield silt loam, 3 to 8 percent slopes, in an area of cropland; about 1,100 feet south, 78 degrees east of the intersection of Workman and Denmar Roads:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many very fine, fine, and medium roots; 5 percent rock fragments; moderately acid; abrupt smooth boundary.

Bt1—8 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; friable; common very fine, fine, and medium roots; few distinct clay films on faces of peds and in pores; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—17 to 26 inches; strong brown (7.5YR 5/6) silty clay; few medium prominent light gray (10YR 7/2) lithochromic mottles; moderate fine and medium subangular blocky structure; friable; few very fine roots; few distinct clay films on faces of peds and in pores; 5 percent rock fragments; very strongly acid; clear wavy boundary.

Bt3—26 to 37 inches; strong brown (7.5YR 5/6) silty clay; few medium prominent light gray (10YR 7/2) lithochromic mottles; weak coarse prismatic structure parting to moderate medium platy; firm; common distinct clay films on faces of peds and in pores; 10 percent rock fragments; very strongly acid; clear wavy boundary.

BC—37 to 46 inches; strong brown (7.5YR 5/6) channery silty clay; common medium and coarse faint yellowish red (5YR 5/6), common medium and coarse distinct brownish yellow (10YR 6/8), and few medium prominent light gray (2.5Y 7/2) lithochromic mottles; weak coarse prismatic structure; firm; 20 percent rock fragments; very strongly acid; clear smooth boundary.

Cr—46 inches; highly weathered, pale olive (5Y 6/3), brownish yellow (10YR 6/8), and dark reddish brown (5YR 3/4) siltstone bedrock.

The thickness of the solum ranges from 40 to 70 inches. The depth to hard bedrock is more than 48 inches. The content of limestone, siltstone, and chert fragments ranges, by volume, from 0 to 20 percent in the upper part of the solum and from 10 to 35 percent in the lower part. In unlimed areas reaction is very strongly acid to moderately acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The B horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Many pedons have lithochromic mottles in shades of brown, white, gray, yellow, or red. The texture of the fine-earth material is silt loam, silty clay loam, or silty clay.

Elliber Series

The Elliber series consists of very deep, well drained soils that formed in material weathered from chert interbedded with shale or sandstone (fig. 14). These soils are on side slopes in the eastern half of the county in areas of the Huntersville Chert geologic deposits. Slope ranges from 35 to 55 percent.

Elliber soils are on the landscape with the well drained Dekalb, Hazleton, Mertz, and Weikert soils. Elliber soils are deeper than the Dekalb, Hazleton, and Weikert soils. They have more clay in the upper part of the Bt horizon and a higher content of chert fragments than the Mertz soils.

Typical pedon of Elliber extremely channery silt loam, 35 to 55 percent slopes, in a wooded area; about 5,000 feet north, 86 degrees east of the intersection of County Route 21 and Violet Road, south of Huntersville:

Oi—2 inches to 0; slightly decomposed forest litter.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) extremely channery silt loam; weak fine granular structure; friable; many very fine, fine, medium, and coarse roots; 65 percent chert fragments; extremely acid; abrupt smooth boundary.

BA—2 to 5 inches; yellowish brown (10YR 5/4) extremely channery silt loam; weak fine granular structure; friable; many very fine, fine, medium, and coarse roots; 65 percent chert fragments; extremely acid; abrupt wavy boundary.

Bw1—5 to 10 inches; yellowish brown (10YR 5/4) very channery loam; weak fine granular structure; friable; many very fine, fine, and medium roots; 60 percent chert fragments; very strongly acid; clear smooth boundary.

Bw2—10 to 23 inches; yellowish brown (10YR 5/6) extremely channery loam; weak fine granular structure; friable; many very fine, fine, and medium and few coarse roots; 75 percent chert fragments; very strongly acid; abrupt wavy boundary.

Bw3—23 to 30 inches; yellowish brown (10YR 5/4) very channery loam; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine and common fine roots; 45 percent chert fragments; very strongly acid; clear wavy boundary.

Bt1—30 to 35 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine subangular blocky structure; friable; few very fine, fine, medium, and coarse roots; few distinct clay films on faces of peds and on rock fragments; 55 percent chert fragments; extremely acid; clear smooth boundary.

Bt2—35 to 41 inches; yellowish brown (10YR 5/4) very channery loam; weak fine subangular blocky structure parting to weak fine granular; friable; few very fine, fine, and medium roots; few faint clay films on rock fragments and in root channels; 50 percent chert fragments; extremely acid; gradual wavy boundary.

Bt3—41 to 48 inches; yellowish brown (10YR 5/4) very channery loam; weak fine and medium subangular blocky structure; friable; few very fine, fine, and medium roots; few faint clay films on faces of peds; 50 percent chert fragments; very strongly acid; abrupt smooth boundary.

Bt4—48 to 62 inches; yellowish brown (10YR 5/4) very channery clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint clay films on faces of peds; 60 percent chert fragments; very strongly acid; abrupt wavy boundary.

Bt5—62 to 65 inches; yellowish brown (10YR 5/6) very channery clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; 40 percent chert fragments; very strongly acid.

The thickness of the solum ranges from 40 to 70 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 40 to 65 percent in the A horizon and from 40 to 80 percent in the B horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. The rock fragments are mainly chert or cherty sandstone. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The BA, Bw, and Bt horizons have hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam, loam, or clay loam.

Faywood Series

The Faywood series consists of moderately deep, well drained soils that formed in material weathered from limestone interbedded with thin layers of shale or siltstone (fig. 15). These soils are on uplands in the areas of Browns, Brushy, and Michael Mountains and in the area south of Green Bank. They are in areas of the Helderberg, Cayugan, and McKenzie geologic deposits. Slope ranges from 3 to 55 percent.

Faywood soils are on the landscape with the well drained Berks and Blackthorn soils. Faywood soils have more clay and fewer rock fragments in the subsoil than the Berks soils. They are not so deep and have fewer rock fragments in the subsoil than the Blackthorn soils.

Typical pedon of Faywood silt loam, 15 to 35 percent slopes, very rocky, in a pastured area; about 1 mile north, 40 degrees west of the intersection of West Virginia Routes 92 and 84 at Frost:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; friable; many very fine and fine roots; 2 percent rock fragments; slightly acid; clear wavy boundary.

BA—5 to 8 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure parting to moderate fine granular; friable; common fine roots; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bt—8 to 21 inches; strong brown (7.5YR 5/6) silty clay loam; strong fine and medium angular blocky structure; firm; few fine roots; many prominent coatings on faces of peds and in pores; 5 percent rock fragments; slightly acid; gradual wavy boundary.

C—21 to 28 inches; strong brown (7.5YR 5/6) clay; olive (5Y 5/4) and black (10YR 2/1), highly weathered siltstone fragments; massive; firm; 10 percent rock fragments; slightly alkaline; clear wavy boundary.

R—28 inches; limestone bedrock.

The thickness of the solum ranges from 20 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. The content of limestone, shale, and siltstone fragments ranges, by volume, from 0 to 5 percent in the A horizon, from 0 to 15 percent in the B horizon, and from 5 to 15 percent in the C horizon. In unlimed areas reaction is slightly acid to slightly alkaline.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The BA horizon has hue of 10YR, value of 4 or 5, and chroma of 4. The texture of the fine-earth material is silt loam.

The Bt horizon has hue of 7.5YR, 10YR, or 2.5Y and value and chroma of 4 to 6. The texture of the fine-earth material is silty clay loam, silty clay, or clay.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is clay.

Fluvaquents

Fluvaquents are very deep, poorly drained soils that formed in alluvial material derived from soils underlain by siltstone, sandstone, or limestone. These soils are on nearly level flood plains along minor drainageways above elevations of 3,000 feet. Slope ranges from 0 to 3 percent.

Fluvaquents are on the landscape with the well drained, moderately well drained, and somewhat poorly drained Udifluvents; the poorly drained Trussel soils; and the very poorly drained Medihemists. Fluvaquents generally have more clay in the profile than the Udifluvents. They do not have the fragipan and the soil development that are typical of the Trussel soils. Unlike the Medihemists, they do not consist dominantly of organic matter.

A typical pedon for Fluvaquents is not given because of the variability of these soils. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 10 percent in the A horizon and from 0 to 60 percent in the underlying horizons. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 to 3. The texture of the fine-earth material is loam, silt loam, or sandy loam.

The underlying horizons have hue of 2.5Y, 5Y, or 5GY, value of 4 to 6, and chroma of 1 to 3. The texture of the fine-earth material is loam, sandy loam, loamy sand, clay loam, or sandy clay loam.

Gauley Series

The Gauley series consists of moderately deep, well drained soils that formed in material weathered from acid sandstone (fig. 16). These soils are on broad ridgetops and the upper side slopes west of the Greenbrier River at elevations of more than 4,000 feet. They are in areas of the Kanawha and New River geologic deposits. Slope ranges from 3 to 35 percent.

Gauley soils are on the landscape with the well drained Briery and Mandy soils and the somewhat poorly drained Leatherbark soils. Gauley soils have more sand in the subsoil than the Mandy soils and are not so deep as the Briery soils. They have more rock fragments in the subsoil than the Leatherbark soils.

Typical pedon of Gauley channery sandy loam, 3 to 15 percent slopes, extremely stony, in a young stand of red spruce; about 1.25 miles north, 28 degrees east of the Bald Knob fire tower on Back Allegheny Mountain:

Oi—3 inches to 0; slightly decomposed forest litter.

Oa—0 to 3 inches; black (5YR 2/1), highly decomposed forest litter.

A—3 to 5 inches; black (N 2/0) channery sandy loam; weak fine and medium granular structure; friable; many fine, medium, and coarse roots; 30 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—5 to 9 inches; brown (7.5YR 5/2) very channery sandy loam; weak fine and medium granular structure; firm; few fine, medium, and coarse roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

Bhs—9 to 12 inches; dark reddish brown (5YR 3/2) very channery sandy loam; weak medium subangular blocky structure; firm; moderately smeary; few fine, medium, and coarse roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

Bs—12 to 23 inches; strong brown (7.5YR 5/6) very channery loam; weak fine and medium subangular blocky structure; friable; weakly smeary; 40 percent rock fragments; very strongly acid; gradual wavy boundary.

C—23 to 35 inches; yellowish brown (10YR 5/6) extremely channery loam; massive; friable; 70 percent rock fragments; very strongly acid; abrupt wavy boundary.

R—35 inches; olive gray (5Y 4/2) sandstone bedrock.

The thickness of the solum and the depth to sandstone or conglomerate bedrock ranges from 20 to 40 inches. The content of rock fragment ranges, by volume, from 5 to 90 percent in individual horizons; however, it generally ranges between 35 and 60 percent in the particle-size control section. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR or is neutral. It has value of 2 and chroma of 0 or 1.

The E horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 1 or 2. The texture of the fine-earth material is loam, sandy loam, or loamy sand.

The Bhs horizon has hue of 5YR, 7.5YR, or 10YR, value of 2 to 4, and chroma of 1 to 4. The texture of the fine-earth material is loam or sandy loam.

The Bs horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is loam or sandy loam.

The C horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The texture of the fine-earth material is loam, sandy loam, or loamy sand.

Hazleton Series

The Hazleton series consists of deep, well drained soils that formed in acid material weathered from sandstone. These soils are on uplands in the eastern half of the county in areas of the Oriskany geologic deposits. Slope ranges from 3 to 55 percent.

Hazleton soils are on the landscape with the well drained Blackthorn, Dekalb, and Elliber soils. Hazleton soils are deeper than the Dekalb soils but are not so deep as the Blackthorn and Elliber soils.

Typical pedon of Hazleton channery loam in a wooded area of Dekalb-Hazleton complex, 35 to 55 percent slopes, very stony; about 1 mile north, 85 degrees east of the intersection of County Route 21 and Violet Road, south of Huntersville:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 1 inch; black (10YR 2/1) channery loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 20 percent rock fragments; extremely acid; abrupt wavy boundary.

E—1 to 2 inches; dark brown (10YR 4/3) channery loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 20 percent rock fragments; extremely acid; abrupt wavy boundary.

BE—2 to 5 inches; dark yellowish brown (10YR 4/4) channery loam; weak fine subangular blocky structure; friable; many very fine, fine, medium, and coarse roots; 25 percent rock fragments; extremely acid; abrupt wavy boundary.

Bw1—5 to 11 inches; yellowish brown (10YR 5/4) channery fine sandy loam; weak fine subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; 25 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—11 to 18 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak fine and medium subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; 40 percent rock fragments; strongly acid; clear wavy boundary.

Bw3—18 to 30 inches; yellowish brown (10YR 5/8) very channery sandy loam; weak fine and medium subangular blocky structure; friable; few fine and medium roots; 55 percent rock fragments; strongly acid; clear wavy boundary.

C—30 to 50 inches; strong brown (7.5YR 5/6) extremely channery sandy loam; massive; friable; few fine and medium roots; 75 percent rock fragments; strongly acid; clear wavy boundary.

R—50 inches; yellowish brown (10YR 5/6), massive sandstone bedrock.

The thickness of the solum ranges from 25 to 50 inches. The depth to bedrock ranges from 40 to 60 inches. The content of sandstone fragments ranges, by volume, from 5 to 70 percent in the solum and from 35 to 80 percent in the substratum. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The texture of the fine-earth material is loam or sandy loam.

The BE and Bw horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is loam, fine sandy loam, or sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is sandy loam or loamy sand.

Holly Series

The Holly series consists of very deep, poorly drained soils that formed in alluvial material derived mainly from soils underlain by shale, siltstone, sandstone, limestone, or chert. The Holly soils are on flood plains throughout the county. They are subject to frequent flooding. Slope ranges from 0 to 3 percent.

Holly soils are on the landscape with the somewhat excessively drained Potomac soils, the well drained Chavies, Sensabaugh, and Tioga soils, the moderately well drained Lobdell and Sees soils, and the somewhat poorly drained Orrville soils. Holly soils are flooded more frequently than the Chavies, Sensabaugh, Tioga, Lobdell, Sees, and Orrville soils. They have more clay and fewer rock fragments in the profile than the Potomac soils.

Typical pedon of Holly silt loam in a pastured area; about 1.25 miles south, 68 degrees east of the intersection of U.S. Route 219 and the Airport Road, north of Marlinton:

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; many fine distinct dark brown (7.5YR 3/4) mottles; moderate fine granular structure; friable; many very fine and fine roots; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Bg1—4 to 9 inches; dark gray (10YR 4/1) silt loam; common fine distinct dark yellowish brown (10YR 3/4) and common fine prominent dark brown (7.5YR 3/4) mottles; moderate fine subangular blocky structure; friable; common very fine and fine roots; 2 percent rock fragments; moderately acid; abrupt wavy boundary.

Bg2—9 to 11 inches; dark gray (10YR 4/1) sandy loam; few fine prominent dark brown (7.5YR 3/4) mottles; weak medium subangular blocky structure; friable; common very fine and fine roots; 2 percent rock fragments; moderately acid; abrupt wavy boundary.

Bg3—11 to 15 inches; dark gray (10YR 4/1) silt loam; common fine prominent dark brown (7.5YR 3/4) mottles; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; 2 percent rock fragments; strongly acid; abrupt wavy boundary.

Bg4—15 to 21 inches; grayish brown (2.5Y 5/2) silt loam; many fine prominent dark yellowish brown (10YR 4/6), yellowish brown (10YR 5/6), and common fine prominent brown (7.5YR 4/4) mottles; moderate medium and coarse subangular blocky structure; friable; few very fine roots; 2 percent rock fragments; moderately acid; abrupt wavy boundary.

Bg5—21 to 42 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent dark yellowish brown (10YR 4/6) and common medium prominent brown (7.5YR 4/4) mottles; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; friable; few very fine roots; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Cg1—42 to 44 inches; grayish brown (2.5Y 5/2) sandy loam; common fine and medium distinct brown (10YR 5/3) mottles; massive; friable; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Cg2—44 to 52 inches; gray (10YR 5/1) silt loam; many medium prominent dark brown (7.5YR 3/4) and strong brown (7.5YR 4/4) mottles; massive; friable; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Cg3—52 to 54 inches; grayish brown (10YR 5/2) sandy loam; many fine and medium faint brown (10YR 5/3), many fine and medium distinct yellowish brown (10YR 5/6), and few fine and medium prominent dark brown (7.5YR 3/4) mottles; massive; friable; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

Cg4—54 to 65 inches; gray (5Y 5/1) silt loam; few medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; 2 percent rock fragments; moderately acid.

The thickness of the solum ranges from 20 to 44 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 10 percent in the A horizon, from 0 to 15 percent in the B horizon, and from 0 to 25 percent in the C horizon. The rock fragments generally are gravel. In unlimed areas reaction is moderately acid or slightly acid in the A horizon, strongly acid to slightly acid in the upper part of the B horizon, and moderately acid or slightly acid in the lower part of the B horizon and in the C horizon.

The A horizon has hue of 10YR, value of 2 to 6, and chroma of 1 or 2.

The B horizon has hue of 10YR or 2.5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture of the fine-earth material is silt loam, loam, sandy loam, or silty clay loam.

The C horizon has hue of 10YR, 2.5Y, or 5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture of the fine-earth material is silt loam, loam, sandy loam, or silty clay loam.

Leatherbark Series

The Leatherbark series consists of moderately deep, somewhat poorly drained soils that formed in material weathered from interbedded sandstone, siltstone, or shale (fig. 17). These soils are on broad ridgetops and in upland depressions west of the Greenbrier River at elevations of more than 3,500 feet. They are in areas of the Kanawha and New River geologic deposits. Slope ranges from 0 to 15 percent.

Leatherbark soils are on the landscape with the well drained Briery, Gauley, and Mandy soils. Leatherbark soils have fewer rock fragments in the profile than the other soils. They also are not so deep as the Briery soils.

Typical pedon of Leatherbark silt loam, 0 to 15 percent slopes, very stony, in a wooded area; about 4,000 feet north, 38 degrees west of Bald Knob and 1.1 miles north, 66 degrees west of the Cass Scenic Railroad observation platform:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 2 inches; very dark brown (10YR 2/2) silt loam; weak fine granular structure; friable; many very fine, fine, medium, and coarse roots; 5 percent rock fragments; extremely acid; abrupt smooth boundary.

E—2 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine, fine, medium, and coarse roots; 5 percent rock fragments; extremely acid; clear smooth boundary.

Bw1—5 to 9 inches; yellowish brown (10YR 5/6) silty clay loam; common coarse prominent gray (10YR 6/1) and few fine faint yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure; friable; few fine roots; continuous prominent brown (10YR 5/3) coatings on faces of peds and few distinct coatings in pores; 5 percent rock fragments; extremely acid; clear wavy boundary.

Bw2—9 to 18 inches; brownish yellow (10YR 6/6) silty clay loam; common medium faint brownish yellow (10YR 6/8) and common medium distinct light brownish gray (10YR 6/2) mottles; moderate coarse prismatic structure; friable; few fine roots; few distinct coatings in pores; 5 percent rock fragments; very strongly acid; gradual irregular boundary.

Bw3—18 to 35 inches; light olive brown (2.5Y 5/4) channery silt loam; many coarse distinct grayish brown (2.5Y 5/2) and many coarse prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure; firm; few distinct coatings on rock fragments and in pores; 20 percent rock fragments; very strongly acid; clear wavy boundary.

C—35 to 38 inches; dark brown (10YR 4/3) very channery silt loam; many medium distinct gray (10YR 5/1) and common medium prominent yellowish brown (10YR 5/8) mottles; massive; friable; 35 percent rock fragments; very strongly acid; clear wavy boundary.

Cr—38 inches; black (10YR 2/1), gray (10YR 5/1), and reddish brown (2.5YR 4/4), fractured siltstone and shale bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The depth to low-chroma mottles ranges from 4 to 7 inches. The content of siltstone, shale, and sandstone fragments ranges, by volume, from 5 to 20 percent in the A and E horizons, from 5 to 35 percent in the Bw horizon, and from 20 to 55 percent in the C horizon. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. The texture of the fine-earth material is silt loam or loam.

The Bw horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 8, and chroma of 1 to 8. The texture of the fine-earth material is silty clay loam, clay loam, silt loam, or loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 8, and chroma of 1 to 8. The texture of the fine-earth material is silty clay loam, silt loam, or loam.

Lily Series

The Lily series consists of moderately deep, well drained soils that formed in material weathered from acid sandstone. These soils are on upland flats, ridgetops, and side slopes, mainly west of the Greenbrier River. They are in areas of the Pocono and Bluefield geologic deposits. Slope ranges from 3 to 25 percent.

Lily soils are on the landscape with the well drained Berks, Cateache, and Dekalb soils. Lily soils have fewer rock fragments and more clay in the subsoil than the Berks and Dekalb soils. They do not have the red colors that are typical of the Cateache soils.

Typical pedon of Lily loam, 3 to 8 percent slopes, in a wooded area; about 3,200 feet south, 71 degrees west of where the Tom Edgar Bridge passes over the Greenbrier River at Seebert:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 1 inch; very dark grayish brown (10YR 3/2) loam; weak fine and medium subangular blocky structure; very friable; common fine, medium, and coarse roots; extremely acid; abrupt wavy boundary.

E—1 to 2 inches; dark grayish brown (10YR 4/2) loam; weak fine and medium subangular blocky structure; very friable; common fine, medium, and coarse roots; extremely acid; abrupt wavy boundary.

BE—2 to 5 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; very friable; common fine, medium, and coarse roots; extremely acid; abrupt wavy boundary.

Bt1—5 to 15 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; common fine and medium roots; few faint clay films in pores; strongly acid; gradual wavy boundary.

Bt2—15 to 22 inches; strong brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds and in pores; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

BC—22 to 32 inches; strong brown (7.5YR 5/6) channery sandy loam; weak medium subangular blocky structure; friable; few fine roots; 20 percent rock fragments; very strongly acid; abrupt smooth boundary.

Cr—32 to 38 inches; gray, white, brown, and red, highly weathered sandstone bedrock; abrupt wavy boundary.

R—38 inches; gray, white, brown, and red sandstone bedrock.

The thickness of the solum ranges from 20 to 35 inches. The depth to bedrock ranges from 20 to 40 inches. The content of sandstone fragments ranges, by volume, from 0 to 10 percent in the A and E horizons, from 0 to 25 percent in the B horizon, and from 5 to 35 percent in the C horizon. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The texture of the fine-earth material is loam or fine sandy loam.

The BE horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 8. The texture of the fine-earth material is loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine-earth material is loam, sandy clay loam, or clay loam.

The BC horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 to 8. The fine-earth material is loam, sandy loam, or fine sandy loam.

Lobdell Series

The Lobdell series consists of very deep, moderately well drained soils that formed in alluvial material derived from soils underlain by sandstone, siltstone, shale, limestone, or chert. The Lobdell soils are on flood plains, mainly in the eastern half of the county. They are subject to occasional flooding. Slope ranges from 0 to 3 percent.

Lobdell soils are on the landscape with the somewhat excessively drained Potomac soils, the well drained Chavies and Tioga soils, the somewhat poorly

Figure 10.—Representative profile of a Berks soil. Olive brown sandstone bedrock is at a depth of about 30 inches. Rock fragments are dominantly less than 3/4 inch in size. The content of rock fragments increases with increasing depth. Depth is marked in feet.

Figure 11.—Profile of a Briery soil. This soil has a very thin surface layer underlain by a loamy-skeletal substratum. The dominant rock type is black sandstone. The red and gray colors are lithochromic. Depth is marked in feet.

Figure 12.—Profile of a Calvin soil. Reddish brown, fine grained sandstone bedrock is at a depth of about 24 inches. Depth is marked in feet.

Figure 13.—Profile of a Cateache soil. An accumulation of clay is between depths of 8 and 24 inches. Dusky red, highly weathered sandstone bedrock is at a depth of about 30 inches. Depth is marked in feet.

Figure 14.—Profile of an Elliber soil. Fragments of chert are throughout the profile but are most easily seen at a depth of about 24 inches. An accumulation of clay begins at a depth of about 30 inches and extends to a depth of more than 65 inches. Depth is marked in feet.

Figure 15.—Representative profile of a Faywood soil. Clay has accumulated in layers in the subsoil, directly below the surface soil. These layers have strong structure. The depth to limestone bedrock ranges from 20 to 40 inches. It varies significantly within short distances. Depth is marked in feet.

Figure 16.—Profile of a Gauley soil. Organic matter and iron and aluminum compounds have been leached from the light colored layer that is at a depth of about 6 inches. They have been deposited in the upper part of the subsoil. Sandstone bedrock is at a depth of about 35 inches. Depth is marked in feet.

Figure 17.—Representative profile of a Leatherbark soil. Low-chroma mottles are at a depth of about 8 inches. Black, gray, and reddish brown siltstone and shale bedrock is at a depth of about 38 inches. Depth is marked in feet.

Figure 18.—Representative profile of a Mandy soil. Olive brown, platy, fine grained sandstone bedrock is at a depth of about 26 inches. Depth is marked in feet.

Figure 19.—Profile of a Potomac soil. The surface layer is about 10 inches thick. It is underlain by a sandy-skeletal substratum. Depth is marked in feet.

Figure 20.—Representative profile of a Shouns soil. Clay has accumulated in layers in the subsoil. These layers begin at a depth of about 12 inches and extend to a depth of about 54 inches. The rock fragments are siltstone and sandstone. Depth is marked in feet.

Figure 21.—Representative profile of a Weikert soil. Black and yellowish brown, highly folded, soft shale and siltstone bedrock is at a depth of about 12 inches. Depth is marked in feet.

drained Orrville soils, and the poorly drained Holly soils. Lobdell soils are not flooded as often as the Potomac and Holly soils but are flooded more often than the Chavies soils. They have less sand in the subsoil than the Tioga soils. They are slightly higher on the landscape than the Orrville soils.

Typical pedon of Lobdell silt loam in a pastured area; about 1 mile north, 52 degrees east of the intersection of West Virginia Routes 92 and 39, north of Minnehaha Springs:

Ap—0 to 10 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium subangular blocky structure parting to moderate fine granular; friable; many very fine and fine roots; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bw1—10 to 19 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; common very fine and fine roots; common dark grayish brown (10YR 4/2) krotovinas; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bw2—19 to 28 inches; dark yellowish brown (10YR 4/4) loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine and fine roots; 2 percent rock fragments; moderately acid; gradual wavy boundary.

C1—28 to 47 inches; light olive brown (2.5Y 5/3) sandy loam; common medium faint grayish brown (2.5Y 5/2) and common medium prominent strong brown (7.5YR 5/6) mottles; massive; friable; few very fine and fine roots; 5 percent rock fragments; neutral; clear wavy boundary.

C2—47 to 65 inches; yellowish brown (10YR 5/6) very gravelly silt loam; few medium prominent grayish brown (2.5Y 5/2) and olive brown (2.5Y 4/3) and common medium distinct yellowish brown (10YR 5/8) mottles; massive; friable; 50 percent rock fragments; neutral.

The thickness of the solum ranges from 24 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 5 percent in the A horizon and from 0 to 15 percent in the Bw and C horizons. The content of rock fragments is higher below a depth of 40 inches than it is above that depth. The rock fragments dominantly are gravel. In unlimed areas reaction is strongly acid to neutral in the A and Bw horizons and moderately acid to neutral in the C horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 or 4. Low-chroma mottles are at a depth of 15 to 24 inches. The texture of the fine-earth material is silt loam, loam, or fine sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 8. The texture of the fine-earth material is silt loam, loam, or sandy loam.

Lodi Series

The Lodi series consists of very deep, well drained soils that formed in material weathered from limestone. These soils are on undulating to rolling uplands from Beard Heights south to the county line. They are in areas of the lower Greenbrier geologic deposits. Slope ranges from 3 to 15 percent.

Lodi soils are on the landscape with the well drained Belmont, Duffield, and Shouns soils and the moderately well drained Sees soils. Lodi soils have more clay in the subsoil than the Belmont, Duffield, and Shouns soils. They also have fewer rock fragments in the profile than the Shouns soils. They generally are redder and do not have the gray colors in the subsoil that are typical of the Sees soils.

Typical pedon of Lodi silt loam, 3 to 8 percent slopes, in a hayfield; about 3,400 feet south, 28 degrees east of the Pearl S. Buck birthplace:

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; moderate fine and medium granular structure; friable; many fine roots; few fine black concretions; neutral; abrupt smooth boundary.

Bt1—6 to 21 inches; reddish brown (5YR 4/4) clay; moderate fine and medium subangular blocky structure; friable; many fine roots; common distinct clay films on faces of peds; few fine black concretions; common fine and medium tubular krotovinas; slightly acid; gradual wavy boundary.

Bt2—21 to 47 inches; yellowish red (5YR 4/6) clay; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; common fine black concretions; few fine and medium tubular krotovinas; very strongly acid; gradual wavy boundary.

BC—47 to 65 inches; yellowish red (5YR 4/6) clay loam; weak medium and coarse subangular blocky structure; friable; many fine and medium black concretions; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches. The depth to bedrock is more than 60 inches. The content of limestone fragments ranges, by volume, from 0 to 5 percent in the Ap horizon and from

0 to 25 percent in the B horizon. In unlimed areas reaction is very strongly acid or strongly acid.

The Ap horizon has hue of 10YR and value and chroma of 3 or 4.

The Bt horizon has hue of 2.5YR, 5YR, or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine-earth material is silty clay loam, silty clay, or clay.

The BC horizon has hue of 2.5YR, 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 6 to 8. The texture of the fine-earth material is clay, silty clay, clay loam, or silty clay loam.

Macove Series

The Macove series consists of very deep, well drained soils that formed in colluvial material derived from acid shale, siltstone, and sandstone. These soils are on gently sloping to steep foot slopes and benches. They mainly are in areas of the Pocano, Chemung, and Brallier geologic deposits. Slope ranges from 3 to 35 percent.

Macove soils are on the landscape with the well drained Berks, Dekalb, and Weikert soils. Macove soils are deeper than the other soils. They also have less sand in the subsoil than the Dekalb soils.

Typical pedon of Macove channery silt loam, 3 to 15 percent slopes, very stony, in a wooded area; about 1.2 miles west of the intersection of West Virginia Route 28 and Thorny Creek Road:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 1 inch; dark brown (10YR 3/3) channery silt loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 20 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 4 inches; brown (10YR 5/3) channery loam; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; very strongly acid; clear wavy boundary.

BE—4 to 7 inches; yellowish brown (10YR 5/6) channery silt loam; weak fine and medium subangular blocky structure; friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—7 to 14 inches; yellowish brown (10YR 5/8) very channery silt loam; weak medium subangular blocky structure; friable; common fine, medium, and coarse roots; few distinct clay films in pores; 35 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—14 to 23 inches; yellowish brown (10YR 5/8) very channery silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine, medium, and coarse roots; common distinct clay films on faces of peds, on rock fragments, and in pores and root channels; 45 percent rock fragments; very strongly acid; clear wavy boundary.

Bt3—23 to 37 inches; strong brown (7.5YR 5/6) very channery silty clay loam; weak fine and medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds, on rock fragments, and in pores and root channels; 50 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt4—37 to 65 inches; brown (7.5YR 5/4) extremely channery silty clay loam; weak medium and coarse subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds, on rock fragments, and in pores and root channels; common medium black concretions; 65 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 15 to 35 percent in the A and E horizons and from 15 to 70 percent in the BE and Bt horizons. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is very strongly acid or strongly acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine-earth material is loam or silt loam.

The BE horizon has hue of 10YR and value and chroma of 4 to 6. The texture of the fine-earth material is loam or silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. In some pedons mottles have high value and chroma. The texture of the fine-earth material is silty clay loam, silt loam, or loam.

Mandy Series

The Mandy series consists of moderately deep, well drained soils that formed in material weathered from interbedded siltstone, shale, or fine grained sandstone (fig. 18). These soils are on uplands at elevations of more than 3,000 feet. They are in areas of the Kanawha, New River, Bluestone, Princeton, Hampshire, and Chemung geologic deposits. Slope ranges from 3 to 80 percent.

Mandy soils are on the landscape with the well drained Briery, Cateache, and Gauley soils, the moderately well drained Snowdog soils, the somewhat poorly drained Leatherbark soils, and the poorly drained Trussel soils. Mandy soils are not so deep as the Briery, Snowdog, and Trussel soils; do not have the fragipan that is characteristic of the Snowdog and Trussel soils; have more rock fragments in the subsoil than the Leatherbark soils; have less sand in the subsoil than the Gauley soils; and do not have the red colors typical of the Cateache soils. Mandy soils have a frigid soil temperature regime, whereas Cateache soils have a mesic soil temperature regime.

Typical pedon of Mandy channery silt loam, 35 to 55 percent slopes, very stony, in a wooded area; about 1.1 miles south, 60 degrees east of the confluence of Abes Run and the East Fork of the Greenbrier River:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 3 inches; very dark brown (10YR 2/2) channery silt loam; moderate fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 15 percent rock fragments; extremely acid; abrupt wavy boundary.

E—3 to 5 inches; dark brown (7.5YR 3/4) channery silt loam; moderate fine and medium granular structure; very friable; many very fine, fine, medium, and coarse roots; 15 percent rock fragments; very strongly acid; abrupt wavy boundary.

BE—5 to 9 inches; dark yellowish brown (10YR 4/6) channery silt loam; weak fine subangular blocky structure; very friable; many very fine, fine, medium, and coarse roots; 25 percent rock fragments; very strongly acid; clear wavy boundary.

Bw1—9 to 16 inches; yellowish brown (10YR 5/6) very channery silt loam; weak fine subangular blocky structure; friable; common very fine, fine, and medium roots; 35 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—16 to 28 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine and medium subangular blocky structure; friable; few very fine, fine, and medium roots; 45 percent rock fragments; very strongly acid; clear wavy boundary.

C—28 to 36 inches; yellowish brown (10YR 5/4) extremely channery silt loam; massive; friable; few fine roots; 65 percent rock fragments; very strongly acid; clear wavy boundary.

Cr—36 inches; dark grayish brown (2.5Y 4/2), highly weathered siltstone bedrock.

The thickness of the solum ranges from 20 to 33 inches. The depth to bedrock ranges from 20 to 40 inches. The content of siltstone, shale, and fine grained sandstone fragments ranges, by volume, from 10 to 20 percent in the A and E horizons, from 25 to 50 percent in the B horizon, and from 60 to 90 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR and value and chroma of 2 to 4.

The E horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 3 or 4. The texture of the fine-earth material is silt loam or loam.

The BE horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. The texture of the fine-earth material is silt loam or loam.

The Bw horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. The texture of the fine-earth material is silt loam or loam.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

Medihemists

Medihemists consist of very deep, very poorly drained soils that formed in organic material. The organic material consists of the poorly decomposed remains of herbaceous and woody plants. These soils are on broad flats near the head of drainageways at elevations of more than 3,000 feet. They are in areas of the Pocano, Maunch Chunk, and Pottsville geologic deposits. Slope ranges from 0 to 3 percent.

Medihemists are on the landscape with the somewhat poorly drained, moderately well drained, and well drained Udifluvents and the poorly drained Fluvaquents and Trussel soils. Medihemists are organic soils, whereas Udifluvents, Fluvaquents, and Trussel soils are mineral soils.

A typical pedon of Medihemists is not given because of the variability of these soils. The solum of these soils does not contain rock fragments or wood fragments. In unlimed areas reaction is extremely acid or very strongly acid.

The surface layer has hue of 5YR, 7.5YR, or 10YR or is neutral. It has value of 2 or 3 and chroma of 0 to 2. It is muck or mucky peat.

The subsurface layer has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 3 or 4. It is mucky peat or muck.

Gray, blue, brown, or red silty clay loam or silty clay is at a depth of more than 60 inches.

Mertz Series

The Mertz series consists of very deep, well drained soils formed in cherty colluvium that contains various amounts of sandstone, siltstone, and shale. These soils are on gently sloping to very steep foot slopes and benches in the eastern half of the county. They are in areas of the Huntersville Chert, Millboro Shale, and Brallier geologic deposits. Slope ranges from 3 to 35 percent.

Mertz soils are on the landscape with the well drained Berks, Elliber, and Weikert soils. Mertz soils are deeper than the Berks and Weikert soils. They also have fewer chert fragments and less clay in the upper part of the Bt horizon than the Elliber soils.

Typical pedon of Mertz channery silt loam, 8 to 15 percent slopes, very stony, in a wooded area of Calvin Price State Forest; about 4,200 feet north, 62 degrees east of the intersection of County Route 21 and the south entrance to Watoga State Park:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) channery silt loam; weak very fine and fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; strongly acid; abrupt wavy boundary.

E—2 to 3 inches; dark grayish brown (10YR 4/2) channery silt loam; weak fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; moderately acid; abrupt wavy boundary.

BE—3 to 8 inches; dark yellowish brown (10YR 4/6) channery silt loam; weak fine subangular blocky structure; friable; many fine, medium, and coarse roots; 20 percent rock fragments; strongly acid; clear wavy boundary.

Bt1—8 to 21 inches; yellowish brown (10YR 5/6) channery silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine, medium, and coarse roots; few faint clay films on faces of peds, on rock fragments, and in pores; 30 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—21 to 36 inches; yellowish brown (10YR 5/6) very channery clay loam; weak fine subangular blocky structure; friable; common medium and coarse roots; common distinct clay films on rock fragments and in pores; 50 percent rock fragments; strongly acid; clear wavy boundary.

Bt3—36 to 54 inches; yellowish brown (10YR 5/8) extremely channery silty clay loam; weak medium subangular blocky structure; firm; few fine roots; few faint clay films on rock fragments and in pores; 65 percent rock fragments; strongly acid; clear wavy boundary.

C—54 to 65 inches; yellowish brown (10YR 5/8) extremely channery silty clay loam; massive; firm; few fine roots; 75 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of chert, sandstone, siltstone, and shale fragments ranges, by volume, from 15 to 45 percent in the A and E horizons, from 15 to 50 percent in the upper part of the B horizon, and from 15 to 75 percent in the lower part of the B horizon and in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is strongly acid or moderately acid in the upper part of the solum and very strongly acid or strongly acid below a depth of 40 inches.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The texture of the fine-earth material is silt loam.

The BE horizon has hue of 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam.

The Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is loam, silt loam, clay loam, or silty clay loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is loam, silt loam, clay loam, or silty clay loam.

Orrville Series

The Orrville series consists of very deep, somewhat poorly drained soils that formed in alluvial material derived from soils underlain by shale, siltstone, sandstone, limestone, or chert. The Orrville soils are on flood plains, mainly in the eastern half of the county. They are subject to occasional flooding. Slope ranges from 0 to 3 percent.

Orrville soils are on the landscape with the somewhat excessively drained Potomac soils, the well drained Chavies and Tioga soils, the moderately well drained Lobdell soils, and the poorly drained Holly soils. Orrville soils generally are flooded less often than the Potomac and Holly soils but more often than the Chavies soils; have less sand in the subsoil than the Tioga soils; and are slightly lower on the landscape than the Lobdell soils.

Typical pedon of Orrville silt loam in a meadow; about 200 feet north, 40 degrees east of the intersection of West Virginia Route 28 and the entrance to the Buckskin Boy Scout Reservation:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium subangular blocky structure parting to moderate medium granular; friable; many very fine, fine, and medium roots; 2 percent rock fragments; neutral; abrupt smooth boundary.

BA—9 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; common very fine and fine roots; 5 percent rock fragments; slightly acid; clear wavy boundary.

Bg1—13 to 25 inches; grayish brown (10YR 5/2) silt loam; many medium prominent yellowish brown (10YR 5/8) and few fine distinct gray (2.5Y 6/2) mottles; weak medium and coarse subangular blocky structure; friable; common very fine roots; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bg2—25 to 40 inches; grayish brown (2.5Y 5/2) silt loam; common medium prominent yellowish red (5YR 5/8), few medium prominent reddish yellow (7.5YR 6/8), and few fine distinct gray (10YR 6/1) mottles; weak medium and coarse subangular blocky structure; friable; few very fine roots; 5 percent rock fragments; strongly acid; clear wavy boundary.

Cg1—40 to 50 inches; gray (10YR 6/1) silt loam; common coarse prominent strong brown (7.5YR 5/8), few medium prominent reddish yellow (7.5YR 6/8), and few fine prominent yellowish red (5YR 5/6) mottles; massive; friable; 10 percent rock fragments; strongly acid; gradual wavy boundary.

Cg2—50 to 65 inches; gray (10YR 5/1) very gravelly loam; many coarse prominent reddish yellow (7.5YR 6/8) and common medium prominent yellowish red (5YR 5/8) mottles; massive; friable; 40 percent rock fragments; strongly acid.

The thickness of the solum ranges from 28 to 42 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 5 percent in the A horizon, from 0 to 10 percent in the B horizon, and from 10 to 40 percent in the C horizon. The content of rock fragments is higher below a depth of 40 inches than it is above that depth. The rock fragments dominantly are gravel. In unlimed areas reaction is strongly acid to slightly acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2.

The B horizon has hue of 10YR, 2.5Y, or 5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 6. The texture of the fine-earth material is silt loam, loam, or silty clay loam.

The C horizon has hue of 10YR, 2.5Y, or 5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 2. The texture of the fine-earth material is silt loam or loam.

Philo Series

The Philo series consists of very deep, moderately well drained soils that formed in alluvial material derived from acid soils underlain by shale, siltstone, or sandstone. The Philo soils are on flood plains in the Deer Creek watershed. They are subject to occasional flooding. Slope ranges from 0 to 3 percent.

Philo soils are on the landscape with the poorly drained Atkins and Purdy soils. Philo soils are flooded less frequently than the Atkins soils and have less clay in the subsoil than the Purdy soils.

Typical pedon of Philo silt loam in a meadow; about 3,000 feet south, 42 degrees west of the intersection of West Virginia Routes 28 and 92 and Pine Grove Road, north of Arbovale:

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many very fine, fine, medium, and coarse roots; 2 percent rock fragments; moderately acid; abrupt wavy boundary.

Bw1—9 to 19 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; common very fine, fine, and medium roots; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bw2—19 to 26 inches; yellowish brown (10YR 5/6) silt loam; common fine prominent gray (10YR 6/1) and few fine distinct strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; friable; common very fine, fine, and medium roots; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bw3—26 to 33 inches; yellowish brown (10YR 5/4) gravelly loam; many medium distinct gray (10YR 6/1) and common medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; 20 percent rock fragments; very strongly acid; clear wavy boundary.

C1—33 to 40 inches; brown (10YR 5/3) very gravelly loam; many medium and coarse distinct gray (10YR 6/1) and many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; few medium roots; 40 percent rock fragments; very strongly acid; clear wavy boundary.

2C2—40 to 48 inches; mixed brown (7.5YR 5/4) and gray (N 5/0) extremely gravelly loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; few medium roots; 75 percent rock fragments; very strongly acid; clear wavy boundary.
2C3—48 to 65 inches; light olive brown (2.5Y 5/4) extremely gravelly loam; many medium prominent gray (N 5/0), common medium prominent gray (10YR 5/1), and many medium prominent strong brown (7.5YR 5/8) mottles; massive; friable; few very fine, fine, and medium roots; 70 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 20 to 48 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 20 percent in the solum, from 0 to 40 percent above a depth of 40 inches in the substratum, and from 0 to 75 percent below a depth of 40 inches in the substratum. The content of rock fragments in the particle-size control section is, by volume, less than 20 percent. The rock fragments dominantly are gravel. In unlimed areas reaction is very strongly acid to moderately acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 3 to 6. Low-chroma mottles range from 10YR 4/2 to 10YR 6/1. High-chroma mottles range from 7.5YR 4/4 to 7.5YR 5/8. The texture of the fine-earth material is silt loam or loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 4. It is mottled. The texture of the fine-earth material is silt loam or loam.

Potomac Series

The Potomac series consists of very deep, somewhat excessively drained soils that formed in coarse textured alluvial material derived from soils underlain by sandstone, siltstone, shale, limestone, or chert (fig. 19). The Potomac soils are on nearly level flood plains, mainly in the eastern half of the county. They are subject to frequent flooding. Slope ranges from 0 to 3 percent.

Potomac soils are on the landscape with the well drained Sensabaugh and Tioga soils, the moderately well drained Lobdell soils, the somewhat poorly drained Orrville soils, and the poorly drained Holly soils. Potomac soils are flooded more frequently than the Sensabaugh, Tioga, Lobdell, and Orrville soils. They have less clay and more rock fragments in the profile than the Holly soils.

Typical pedon of Potomac very gravelly loam in a grassy field; about 1.7 miles north, 72 degrees east of Bird Run Campground, east of Frost:

Oi—1 inch to 0; slightly decomposed grasses.
Ap1—0 to 4 inches; dark brown (10YR 3/3) very gravelly loam, brown (10YR 5/3) dry; weak very fine granular structure; very friable; many very fine and fine roots; 40 percent rock fragments; slightly acid; abrupt wavy boundary.
Ap2—4 to 10 inches; dark brown (10YR 3/3) very gravelly loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; friable; common very fine and fine roots; 40 percent rock fragments; slightly acid; abrupt smooth boundary.
C1—10 to 21 inches; brown (10YR 4/3) extremely gravelly sandy loam; single grain; loose; common very fine and fine roots; 70 percent rock fragments; slightly acid; abrupt wavy boundary.
C2—21 to 40 inches; brown (10YR 4/3) extremely gravelly loamy coarse sand that has pockets of sandy loam; single grain; loose; few very fine roots; 80 percent rock fragments; moderately acid; abrupt wavy boundary.
C3—40 to 65 inches; brown (10YR 4/3) extremely gravelly sandy loam; single grain; loose; few very fine roots; 65 percent rock fragments; moderately acid.

The thickness of the solum ranges from 3 to 12 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges, by volume, from 5 to 50 percent in the A horizon and from 50 to 80 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is strongly acid to neutral.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The texture of the fine-earth material is sandy loam, loamy sand, or sand.

Purdy Series

The Purdy series consists of very deep, poorly drained soils that formed in slack-water deposits of alluvial material derived mainly from acid soils underlain by siltstone, shale, or sandstone. The Purdy soils are on low terraces, mainly along Deer Creek. Slope ranges from 0 to 3 percent.

Purdy soils are on the landscape with the well drained Allegheny and Chavies soils, the moderately well drained Philo soils, and the poorly drained Atkins soils. Purdy soils have more clay in the subsoil than the Allegheny, Chavies, Philo, and Atkins soils.

Typical pedon of Purdy silt loam in a meadow; about 1.1 miles south, 58 degrees west of the intersection of West Virginia Routes 28 and 92 and Pine Grove Road, northwest of Arbovale:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and coarse granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

BAg—5 to 9 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.

Btg1—9 to 14 inches; grayish brown (10YR 5/2) silty clay; many fine and medium prominent brownish yellow (10YR 6/8) and common fine and medium prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common prominent clay films on faces of peds and in pores; very strongly acid; gradual wavy boundary.

Btg2—14 to 38 inches; gray (N 5/0) silty clay; many coarse faint gray (N 6/0), common fine and medium prominent strong brown (7.5YR 5/8), and many fine and medium prominent brownish yellow (10YR 6/8) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many prominent clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

Cg—38 to 65 inches; grayish brown (10YR 5/2) very gravelly silty clay loam; few medium distinct gray (N 5/0), few medium and coarse distinct light olive brown (2.5Y 5/3), and common medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; 45 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 28 to 50 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 15 percent in the solum and from 0 to 50 percent in the substratum. The rock fragments are dominantly sandstone pebbles and gravels. In unlimed areas reaction is extremely acid to strongly acid.

The Ap horizon has hue of 10YR or 2.5Y or is neutral. It has value of 4 or 5 and chroma of 0 to 2.

The B horizon has hue of 10YR or 2.5Y or is neutral. It has value of 4 or 5 and chroma of 0 to 2. The texture of the fine-earth material is clay, silty clay, silty clay loam, or clay loam.

The C horizon has hue of 10YR or 2.5Y or is neutral. It has value of 4 to 6 and chroma of 0 to 3. The texture of the fine-earth material is silty clay or silty clay loam.

Sees Series

The Sees series consists of very deep, moderately well drained soils that formed in colluvial material derived from interbedded limestone and siltstone. These soils are in depressions and along drainageways in areas of the Greenbrier geologic deposits. They are subject to rare flooding. Slope ranges from 0 to 3 percent.

The Sees soils in Pocahontas County are taxadjuncts to the series because they have a seasonal high water table that is slightly higher than is defined for the series. Generally, the A horizon has higher value and chroma and the upper part of the solum has lower pH than is defined as the range for the series. These differences, however, do not significantly affect the use and management of the soils.

Sees soils are on the landscape with the well drained Belmont, Duffield, and Lodi soils and the poorly drained Holly soils. Sees soils have more clay in the subsoil than the Belmont, Duffield, and Holly soils. They generally are not so red as the Lodi soils and have gray colors in the subsoil. They are flooded less often than the Holly soils.

Typical pedon of Sees silt loam in an area of cropland; about 3,880 feet north, 56 degrees west of the Pearl S. Buck birthplace, north of Hillsboro:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/6) silty clay; moderate medium and coarse subangular blocky structure; firm; few very fine roots; few faint clay films in pores; strongly acid; clear wavy boundary.

Bt2—14 to 20 inches; yellowish brown (10YR 5/6) silty clay; common fine light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and yellowish red (5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.

Btg3—20 to 38 inches; gray (10YR 6/1) silty clay; common medium brownish yellow (10YR 6/8) and strong brown (7.5YR 5/6) and common fine reddish brown (5YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct clay films on faces of peds and in pores; strongly acid; clear wavy boundary.

Btg4—38 to 58 inches; gray (10YR 6/1) silty clay; common medium brownish yellow (10YR 6/8), strong brown (7.5YR 5/6), and reddish brown (5YR 4/4) mottles; moderate medium prismatic structure; firm; few very fine roots; few distinct clay films on faces of peds and in pores; 5 percent rock fragments; common fine black concretions; neutral; gradual wavy boundary.

C—58 to 65 inches; reddish brown (5YR 4/3) silty clay; common medium gray (10YR 6/1), brownish yellow (10YR 6/8), and reddish yellow (7.5YR 6/8 and 5YR 6/8) mottles; massive; firm; 5 percent rock fragments; moderately alkaline.

The thickness of the solum ranges from 48 to 58 inches. The depth to bedrock is more than 60 inches. The content of limestone and siltstone fragments ranges, by volume, from 0 to 15 percent in the solum and from 0 to 35 percent in the substratum. In unlimed areas reaction is strongly acid to neutral in the solum and neutral to moderately alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 6.

The Bt horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 5 or 6, and chroma of 1 to 6. The texture of the fine-earth material is silty clay or clay.

The C horizon has hue of 5YR, 7.5YR, 10YR, or 2.5Y, value of 3 to 5, and chroma of 2 to 6. The texture of the fine-earth material is silty clay or clay.

Sensabaugh Series

The Sensabaugh series consists of very deep, well drained soils that formed in alluvial material derived mainly from soils underlain by limestone, sandstone, or siltstone. The Sensabaugh soils are on flood plains west of the Greenbrier River. They are subject to occasional flooding. Slope ranges from 0 to 3 percent.

Sensabaugh soils are on the landscape with the somewhat excessively drained Potomac soils, the well drained Chavies and Shouns soils, and the poorly drained Holly soils. Sensabaugh soils are not flooded as often as the Potomac and Holly soils but are flooded more often than the Chavies soils. They do not have the accumulation of clay in the subsoil that is typical of the Shouns soils.

Typical pedon of Sensabaugh silt loam in a pastured area along Cloverlick Creek; about 3,800 feet north, 43 degrees west of the intersection of County Routes 9 and 9/2, west of Cloverlick:

Ap—0 to 6 inches; dark reddish brown (5YR 3/2) silt loam; moderate fine granular structure; friable; many fine and medium roots; 5 percent rock fragments; slightly acid; abrupt wavy boundary.

BA—6 to 10 inches; dark reddish brown (5YR 3/3) gravelly loam; moderate fine subangular blocky structure; friable; common fine and medium roots; 15 percent rock fragments; slightly acid; clear smooth boundary.

Bw1—10 to 21 inches; dark reddish brown (5YR 3/4) gravelly loam; moderate fine and medium subangular blocky structure; friable; common fine roots; 15 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw2—21 to 34 inches; dark reddish brown (5YR 3/4) gravelly sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; 25 percent rock fragments; slightly acid; clear smooth boundary.

BC—34 to 40 inches; dark reddish brown (5YR 3/4) very gravelly loam; weak medium subangular blocky structure; friable; few fine roots; 40 percent rock fragments; neutral; clear smooth boundary.

C1—40 to 55 inches; reddish brown (5YR 4/4) very gravelly loam; massive; friable; 60 percent rock fragments; neutral; clear smooth boundary.

C2—55 to 65 inches; dark reddish brown (5YR 3/3) extremely gravelly loam; few fine and medium distinct brown (7.5YR 4/4) mottles; massive; friable; 65 percent rock fragments; neutral.

The thickness of the solum ranges from 24 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 10 percent in the A horizon, from 15 to 40 percent in the B horizon, and from 35 to 70 percent in the C horizon; however, it generally ranges from 15 to 35 percent between depths of 10 and 40 inches. The rock fragments dominantly are sandstone pebbles and cobbles. In unlimed areas reaction is slightly acid or neutral.

The Ap horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 2 or 3.

The BA horizon has hue of 5YR and value and chroma of 3 or 4. The texture of the fine-earth material is loam or silt loam.

The Bw and BC horizons have hue of 5YR and value and chroma of 3 or 4. The texture of the fine-earth material is silt loam, loam, silty clay loam, clay loam, or sandy clay loam.

The C horizon has hue of 5YR and value and chroma of 3 or 4. The texture of the fine-earth material is silt loam, loam, clay loam, or sandy clay loam.

Shouns Series

The Shouns series consist of very deep, well drained soils that formed in colluvial or alluvial material derived from shale, siltstone, sandstone, and limestone (fig. 20). These soils are on alluvial fans, foot slopes, and benches; along drainageways; and in coves. They are in areas of the Hampshire, Maccrady, Greenbrier, Bluefield, and Hinton geologic deposits. Slope ranges from 3 to 55 percent.

Shouns soils are on the landscape with the well drained Belmont, Calvin, Cateache, Duffield, Lodi, and Sensabaugh soils and the moderately well drained Blairton soils. Shouns soils are deeper than the Belmont, Blairton, Calvin, and Cateache soils; have more clay in the subsoil than the Calvin and Sensabaugh soils; have fewer rock fragments in the subsoil than the Blairton and Cateache soils; are redder than the Duffield soils; and have less clay and more rock fragments in the subsoil than the Lodi soils.

Typical pedon of Shouns silt loam, 15 to 35 percent slopes, extremely stony; about 2,600 feet north, 80 degrees east of the confluence of the Greenbrier River and Deer Creek, east of Cass:

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium granular structure; friable; many fine roots; 5 percent rock fragments; very strongly acid; abrupt wavy boundary.

BA—3 to 6 inches; brown (7.5YR 5/4) silt loam; weak fine subangular blocky structure; friable; common fine and medium roots; 10 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—6 to 14 inches; reddish brown (5YR 5/4) channery silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine and medium roots; few distinct clay films on faces of peds and in pores; 15 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—14 to 23 inches; reddish brown (5YR 5/4) channery silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine and medium roots; common distinct clay films on faces of peds, on rock fragments, and in pores; 25 percent rock fragments; very strongly acid; clear wavy boundary.

Bt3—23 to 40 inches; reddish brown (5YR 4/4) very channery silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine and medium roots; common prominent clay films on faces of peds, on rock fragments, and in pores; 35 percent rock fragments; very strongly acid; gradual wavy boundary.

BC—40 to 53 inches; dark reddish brown (5YR 3/4) very channery clay loam; weak fine and medium subangular blocky structure; firm; few medium roots; 45 percent rock fragments; very strongly acid; clear wavy boundary.

C—53 to 65 inches; dark red (2.5YR 3/6) very channery clay loam; massive; firm; few fine roots; 40 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 45 to 60 inches. The depth to bedrock is more than 60 inches. The content of sandstone, siltstone, shale, and limestone fragments ranges, by volume, from 0 to 10 percent in the A horizon and from 0 to 45 percent in the B and C horizons. The content of rock fragments in the upper 20 inches of the Bt horizon averages, by volume, less than 35 percent. In unlimed areas reaction is strongly acid or moderately acid.

The A horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3.

The BA horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4. The texture of the fine-earth material is silt loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. The texture of the fine-earth material is silty clay loam, clay loam, or silt loam.

The BC horizon has hue of 2.5YR or 5YR, value of 3, and chroma of 4. The texture of the fine-earth material is silty clay loam or clay loam.

The C horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 6. The texture of the fine-earth material is clay loam.

Snowdog Series

The Snowdog series consists of very deep, moderately well drained soils that formed in colluvial material derived from acid shale, siltstone, or sandstone. These soils are on moderately steep and steep foot slopes and benches at elevations of more than 3,000 feet. They are in areas of the Kanawha, New River, Bluestone, Princeton, Hampshire, and Chemung geologic deposits. Slope ranges from 15 to 35 percent.

Snowdog soils are on the landscape with the well drained Briery and Mandy soils and the poorly drained Trussel soils. Snowdog soils have a fragipan and fewer rock fragments in the profile than the Briery and Mandy soils. They are also deeper than the Mandy soils. They generally are on the upper foot slopes, whereas Trussel soils are on the lower foot slopes.

Typical pedon of Snowdog silt loam, 15 to 35 percent slopes, extremely stony, in a wooded area;

about 1 mile north, 68 degrees east of the confluence of the Cherry River and the Left Branch, near the Falls of Hills Creek Scenic Area:

Oi—2 inches to 1 inch; slightly decomposed forest litter.

Oe—1 inch to 0; moderately decomposed forest litter.

A—0 to 2 inches; very dark brown (10YR 2/2) silt loam; weak fine and medium granular structure; friable; many very fine, fine, medium, and coarse roots; 5 percent rock fragments; extremely acid; abrupt smooth boundary.

BA—2 to 4 inches; dark brown (10YR 4/3) silt loam; moderately fine and medium subangular blocky structure; friable; many very fine, fine, medium, and coarse roots; 10 percent rock fragments; very strongly acid; clear wavy boundary.

Bw—4 to 16 inches; yellowish brown (10YR 5/6) channery silt loam; moderate fine and medium subangular blocky structure; friable; many very fine, fine, medium, and coarse roots; few distinct coatings on rock fragments and in root channels; 15 percent rock fragments; very strongly acid; abrupt smooth boundary.

Bx—16 to 40 inches; yellowish brown (10YR 5/4) very channery loam; few fine distinct grayish brown (10YR 5/2) and prominent yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure parting to weak medium platy; very firm and brittle; common distinct coatings on rock fragments and in pores; 45 percent rock fragments; very strongly acid; clear smooth boundary.

BC—40 to 55 inches; yellowish brown (10YR 5/4) very channery sandy loam; few medium prominent grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/8) mottles; weak very coarse prismatic structure parting to weak coarse subangular blocky; friable; common distinct coatings on rock fragments and in pores; 45 percent rock fragments; very strongly acid; gradual wavy boundary.

C—55 to 65 inches; yellowish brown (10YR 5/6) channery silt loam; few fine prominent grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/8) mottles; massive; friable; common distinct coatings on rock fragments and in pores; 25 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 50 to 65 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 5 to 45 percent in the A, BA, Bw, and BC horizons and from 20 to 70 percent in the Bx and C horizons. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 4.

The BA horizon has hue of 7.5YR or 10YR and value and chroma of 3 or 4. The texture of the fine-earth material is silt loam or loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

The Bx horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 8. It is mottled. The texture of the fine-earth material is loam or sandy loam.

The BC and C horizons have hue of 10YR, value of 4 to 6, and chroma of 4 to 8. The texture of the fine-earth material is sandy loam, loam, silt loam, or silty clay loam.

Tioga Series

The Tioga series consists of very deep, well drained soils that formed in alluvial material derived from soils underlain by sandstone, siltstone, shale, limestone, or chert. The Tioga soils are on flood plains along the Greenbrier River and its tributaries. They are subject to occasional flooding. Slope ranges from 0 to 3 percent.

Tioga soils are on the landscape with the somewhat excessively drained Potomac soils, the well drained Chavies soils, the moderately well drained Lobdell soils, the somewhat poorly drained Orrville soils, and the poorly drained Holly soils. Tioga soils are flooded less often than the Potomac and Holly soils but more often than the Chavies soils. They have more sand in the subsoil than the Lobdell and Orrville soils.

Typical pedon of Tioga fine sandy loam in a meadow; about 1.3 miles south, 60 degrees east of the intersection of U.S. Route 219 and the Airport Road, north of Marlinton:

Ap—0 to 10 inches; dark yellowish brown (10YR 3/4) fine sandy loam; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine and fine roots; 2 percent rock fragments; moderately acid; clear smooth boundary.

Bw1—10 to 18 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure parting to weak fine granular; friable; many very fine and fine roots; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bw2—18 to 29 inches; brown (7.5YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; few very fine and fine roots;

2 percent rock fragments; strongly acid; gradual wavy boundary.

Bw3—29 to 38 inches; brown (7.5YR 4/4) fine sandy loam; moderate fine and medium subangular blocky structure; friable; few very fine and fine roots; 2 percent rock fragments; moderately acid; gradual wavy boundary.

C—38 to 65 inches; brown (7.5YR 4/4) fine sandy loam; massive; friable; 5 percent rock fragments; moderately acid.

The thickness of the solum ranges from 18 to 40 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 15 percent in the solum and from 0 to 55 percent in the substratum. The rock fragments are dominantly sandstone pebbles and cobbles. In unlimed areas reaction is strongly acid to neutral in the solum and moderately acid to slightly alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. The texture of the fine-earth material is fine sandy loam, sandy loam, loam, or silt loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The texture of the fine-earth material is fine sandy loam, sandy loam, or loamy sand.

Trussel Series

The Trussel series consists of very deep, poorly drained soils that formed in colluvial material derived from acid shale, siltstone, and sandstone. These soils are on gently sloping to strongly sloping foot slopes and benches at elevations of more than 3,000 feet. They are in areas of the Kanawha, New River, Bluestone, Princeton, Hampshire, and Chemung geologic deposits. Slope ranges from 3 to 15 percent.

Trussel soils are on the landscape with the well drained Mandy soils; the well drained, moderately well drained, and somewhat poorly drained Udifluvents; the moderately well drained Snowdog soils; the poorly drained Fluvaquents; and the very poorly drained Medihemists. Trussel soils are deeper than the Mandy soils. They are on the lower foot slopes, whereas Snowdog soils generally are on the upper foot slopes. Trussel soils have a fragipan and greater soil development than the Udifluvents and Fluvaquents. They have a lower content of organic matter than the Medihemists.

Typical pedon of Trussel silt loam, 3 to 15 percent slopes, very stony, in a wooded area; about 1.5 miles south, 47 degrees east of the confluence of Abes Run and the East Fork of the Greenbrier River:

Oe—2 inches to 0; moderately decomposed forest litter.

A—0 to 2 inches; black (10YR 2/1) silt loam; weak fine and medium granular structure; very friable; many very fine, fine, and medium roots; 5 percent rock fragments; extremely acid; abrupt smooth boundary.

E—2 to 6 inches; light brownish gray (10YR 6/2) silt loam; common medium prominent brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; common very fine, fine, and medium roots; many prominent very dark grayish brown (10YR 3/2) coatings on faces of peds; 5 percent rock fragments; extremely acid; clear wavy boundary.

Bw1—6 to 11 inches; gray (10YR 6/1) silt loam; many medium prominent brownish yellow (10YR 6/8) and many fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium and coarse prismatic structure; friable; few very fine, fine, and medium roots; 10 percent rock fragments; extremely acid; clear wavy boundary.

Bw2—11 to 18 inches; gray (10YR 6/1) channery silt loam; many medium prominent yellowish brown (10YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium and coarse prismatic structure; friable; few very fine and fine roots; 15 percent rock fragments; very strongly acid; gradual wavy boundary.

Bx—18 to 35 inches; olive (5Y 5/3) channery loam; common medium prominent gray (10YR 6/1) and many coarse prominent strong brown (7.5YR 5/8) mottles; weak very coarse prismatic structure parting to weak medium platy; firm and brittle; few very fine roots; 30 percent rock fragments; very strongly acid; gradual wavy boundary.

BC—35 to 47 inches; light olive gray (5Y 6/2) very channery loam; common medium prominent strong brown (7.5YR 5/8) mottles; weak medium and coarse platy structure; firm; few very fine roots; 45 percent rock fragments; very strongly acid; gradual wavy boundary.

C—47 to 65 inches; light olive brown (2.5Y 5/3) very channery loam; common fine prominent gray (10YR 6/1) and common medium prominent strong brown (7.5YR 5/8) mottles; massive; firm; 50 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than

60 inches. The content of rock fragments ranges, by volume, from 0 to 30 percent in the A, E, and Bw horizons and from 20 to 60 percent in the Bx and C horizons. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4.

The E horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Red, brown, or yellow mottles are common. The texture of the fine-earth material is silt loam or loam.

The Bw horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 1 to 8. The texture of the fine-earth material is silt loam, loam, silty clay loam, or sandy clay loam.

The Bx horizon has hue of 7.5YR, 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 1 to 6. The texture of the fine-earth material is silt loam or loam.

The BC and C horizons have hue of 7.5YR, 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 1 to 6. The texture of the fine-earth material is silt loam or loam.

Udifluvents

Udifluvents are very deep, well drained to somewhat poorly drained soils that formed in alluvial material derived from soils underlain by siltstone, sandstone, or limestone. These soils are on nearly level flood plains along minor drainageways at elevations of more than 3,000 feet. Slope ranges from 0 to 3 percent.

Udifluvents are on the landscape with the poorly drained Fluvaquents and Trussel soils and the very poorly drained Medihemists. Udifluvents generally have less clay in the profile than the Fluvaquents. They do not have the fragipan and the soil development that are typical of the Trussel soils. Unlike the Medihemists, they do not consist dominantly of organic matter.

A typical pedon for Udifluvents is not given because of the variability of these soils. The depth to bedrock is more than 60 inches. The content of rock fragments ranges, by volume, from 0 to 35 percent in the A horizon and from 0 to 70 percent in the underlying horizons. In unlimed areas reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The texture of the fine-earth material is loam or sandy loam.

The underlying horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. The texture of the fine-earth material is sandy loam or loamy sand.

Udorthents

Udorthents formed in a mixture of soil material and rock fragments in excavations, filled areas, or other disturbed areas used for highways or as construction sites. In places the materials have been transported several hundred yards from the excavated area to the fill site. These soils are dominantly along the Highland Scenic Highway. Slope ranges from 0 to 80 percent.

A typical pedon of Udorthents is not given because of the variability of these soils. The depth to bedrock is more than 60 inches. The rock fragments vary in size, kind, and amount. In unlimed areas reaction is extremely acid to moderately alkaline.

The A horizon has hue of 2.5YR, 5YR, 7.5YR, 10YR, or 2.5Y, value of 1 to 4, and chroma of 4 to 6. The texture of the fine-earth material is sandy loam, loam, silt loam, clay loam, or silty clay.

The underlying horizons have hue of 2.5YR, 5YR, 7.5YR, 10YR, 2.5Y, or 5Y, value of 3 to 7, and chroma of 1 to 8. Low-chroma mottles are lithochromic. The texture of the fine-earth material is sandy loam, loam, silt loam, clay loam, silty clay loam, or silty clay.

Weikert Series

The Weikert series consists of shallow, well drained soils that formed in acid material weathered from siltstone, shale, or fine grained sandstone (fig. 21). These soils are adjacent to flood plains and terraces on uplands in the eastern half of the county. They are primarily in areas of the Brallier and Millboro Shale geologic deposits. Slope ranges from 3 to 80 percent.

Weikert soils are on the landscape with the well drained Allegheny, Berks, Elliber, Macove, and Mertz soils. They are not so deep as the other soils.

Typical pedon of Weikert channery silt loam, 25 to 55 percent slopes, in a wooded area; about 600 feet north, 38 degrees west of the intersection of West Virginia Routes 39 and 92 at Rimel:

Oi—1 inch to 0; slightly decomposed forest litter.

A—0 to 1 inch; dark brown (10YR 3/3) channery silt loam; weak very fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 30 percent rock fragments; very strongly acid; abrupt smooth boundary.

E—1 to 6 inches; yellowish brown (10YR 5/4) very channery silt loam; weak very fine granular structure; very friable; many very fine, fine, medium, and coarse roots; 45 percent rock fragments; very strongly acid; abrupt smooth boundary.

Bw—6 to 11 inches; yellowish brown (10YR 5/6) very channery silt loam; moderate medium and fine subangular blocky structure; friable; common fine, medium, and coarse roots; 35 percent rock fragments; very strongly acid; abrupt smooth boundary.

C—11 to 15 inches; brownish yellow (10YR 6/6) extremely channery silt loam; massive; friable; few fine, medium, and coarse roots; 65 percent rock fragments; strongly acid; clear smooth boundary.

Cr—15 inches; multicolored siltstone and shale bedrock.

The thickness of the solum ranges from 8 to 20 inches. The depth to bedrock ranges from 10 to 20 inches. The content of siltstone, shale, and fine grained sandstone fragments ranges, by volume, from 15 to 35 percent in the A horizon, from 35 to 60 percent in the B horizon, and from 60 to 85 percent in the C horizon. The content of rock fragments in the particle-size control section averages, by volume, more than 35 percent. In unlimed areas reaction is very strongly acid or strongly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 5, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

The B horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. The texture of the fine-earth material is silt loam or loam.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 5 or 6, and chroma of 4 to 8. The texture of the fine-earth material is silt loam or loam.

Formation of the Soils

The origin and development of the soils in Pocahontas County are explained in this section. The five major factors of soil formation are identified, and their influence on the soils in the county is described. Also, the morphology of the soils is related to horizon nomenclature and the processes of horizon development.

Factors of Soil Formation

The soils in Pocahontas County formed as a result of the interaction of five major factors of soil formation—parent material, time, climate, living organisms, and topography. Each factor modifies the effect of the others. Parent material, topography, and time have resulted in the major differences among the soils in the county. Climate and living organisms generally influence soil formation uniformly throughout broad areas.

Parent Material, Time, and Climate

The character of the parent material strongly influences the time required for soil formation and the nature of the soil that forms. The soils of the county formed in residual, colluvial, and alluvial material. Most formed in material weathered from interbedded shale, siltstone, sandstone, or limestone. For example, Berks soils formed in material weathered from interbedded siltstone, shale, and fine grained sandstone and Lodi soils formed in material weathered from limestone.

The residuum is the oldest parent material in the county. Soil formation has been retarded by resistant rock, the slope, and erosion. Consequently, the profile of some of the soils that formed in residual material is less well developed than that of some of the soils that formed in younger material.

Colluvial material is along foot slopes and in coves. This material moved downslope from areas of residual soils. Shouns soils formed in colluvium below areas of Belmont, Calvin, and Cateache soils.

The alluvial parent material on terraces and flood plains was washed from areas of acid and limy soils on uplands. The soil-forming processes have had considerable time to act on the material on terraces. Many additions, losses, and alterations have taken place. The resulting soils, such as the Allegheny soils, are strongly leached and have a moderately well developed profile.

The alluvium on flood plains is the youngest parent material in the county. Most of the soils on flood plains have a weakly developed profile because the soil-forming processes have had little time to act. Potomac, Sensabaugh, and Tioga soils are examples of soils on flood plains.

Climate is relatively uniform throughout most of the survey area, except at the higher elevations in the western part of the county where the mean annual temperature is lower and the mean annual precipitation is higher. Because of the cooler temperatures and the higher amounts of rainfall in this area, the subsurface layer of the Gauley soils is leached. Mandy soils, which formed in siltstone, shale, and fine grained sandstone in areas where precipitation is greater, have a higher content of clay than the Berks soils, which formed in the same type of parent material but in areas that receive a lower amount of rainfall. Poorly drained and very poorly drained soils are more common in areas that receive a higher amount of rainfall.

Living Organisms

Living organisms, including plants, animals, bacteria, and fungi, affect soil formation. The kind and amount of vegetation are generally responsible for the content of organic matter and color of the surface layer and are partly responsible for the content of nutrients. Earthworms and burrowing animals help to keep the soil open and porous. They mix organic material with mineral matter by moving soil to the surface. Bacteria and fungi decompose organic matter, thus releasing plant nutrients.

Human activities also affect soil formation. Clearing the forest, plowing, burning, and mining, for example, affect the characteristics of the surface layer. Human activities also include adding fertilizer, mixing some of the soil horizons, and moving soil material from one place to another.

Topography

Topography affects soil formation by its effect on the amount of water moving through the soil, the amount and rate of runoff, and the rate of erosion. Large amounts of water have moved through the gently sloping and strongly sloping soils in the county. This movement favors the formation of deep soils that have a moderately developed to well developed profile. On steep and very steep hillsides, less water moves through the soils and more water runs off the surface. The soil material is washed away almost as rapidly as a soil forms. As a result, the soils on many of the steeper hillsides are shallower over bedrock than the soils on the more gentle slopes.

The topography in the county favors the formation of soils on flood plains and terraces. The soils on flood plains are weakly developed, however, mainly because too little time has elapsed since the material was deposited.

Morphology of the Soils

The results of the soil-forming processes are evident in the different layers, or horizons, in the soil profile. The profile extends from the soil surface downward to material that has been little changed by the soil-forming processes. Most soils have three major horizons, called the A, B, and C horizons. Subdivisions of these horizons are indicated by numbers and lowercase letters in the horizon designators.

The A horizon is the surface layer. It is the layer that has the maximum accumulation of organic matter. It is also the layer of maximum leaching, or eluviation, of clay and iron.

The B horizon underlies the A horizon and is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds leached from the surface layer. It commonly has blocky structure and generally is firmer and lighter in color than the A horizon.

The C horizon is below the A and B horizons. It consists of material that has been modified by weathering but is little altered by the soil-forming processes.

Many processes have influenced the formation of horizons in the soils in Pocahontas County. The more important of these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation and translocation of clay minerals, and the formation of structure. These processes are continuous and have been taking place for thousands of years.

In most of the soils on uplands in the county, the B horizon is yellowish in color, mainly because of iron oxides. The B horizon has blocky structure and, in places, contains translocated clay minerals.

A fragipan has formed in the B horizon of some of the soils on foot slopes. This layer is dense and brittle, is mottled, and is moderately slowly permeable or slowly permeable. The grayish colors in the fragipan are the result of gleying, or the reduction of iron, during soil formation.

References

American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

Colyer, Dale, and Anthony Ferrise. 1989. West Virginia agriculture, 1987 census of agriculture, selected data from the advance state report. R.D. Publ. 736.

Pocahontas County Historical Society, Inc. 1981. History of Pocahontas County, West Virginia.

Price, Paul H. 1929. West Virginia geological survey, Pocahontas County.

Schnur, G. Luther. 1937. Yields, stand, and volume tables for even-aged upland oak forests. U.S. Dep. Agric. Tech. Bull. 560. (Reprinted in 1961)

Strausbaugh, P.D., and Earl L. Core. [n.d.] Flora of West Virginia. 2d ed.

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.

United States Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436.

United States Department of Agriculture, Soil Conservation Service. 1992. Keys to soil taxonomy. 5th ed. Soil Surv. Staff, Soil Manage. Support Serv. Tech. Monogr. 19.

United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Surv. Staff, U.S. Dep. Agric. Handb. 18.

West Virginia Geological and Economic Survey. 1968. Geologic map of West Virginia.

Williams, B.H., and H.M. Fridley. 1938. Soil survey of Pocahontas County, West Virginia. U.S. Dep. Agric., Bur. Chem. and Soils, Ser. 1933, No. 14.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Bajada. A broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

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.

Carbolith. Dark sedimentary rocks that leave black or very dark (Munsell value of 3 or less) streaks or powder. Carbolith includes coal, bone coal, and shale and mudstone that have a high content of carbon. In general, this material contains at least 25 percent carbonaceous matter, by volume, oxidizable at 350 to 400 degrees C.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque. A semicircular, concave, bowllike area that has steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Congeliturbate. Soil material disturbed by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coppice dune. A small dune of fine grained soil material stabilized around shrubs or small trees.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cuesta. A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Desert pavement. On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediments or that remains after finer particles have been removed by running water or the wind.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—

excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field* *capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

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.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithochromic mottles. Mottles that have inherited their color from the rocks that made up the parent material of the soil.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minesoil. A young soil in recently deposited earthy materials resulting from deep mining or surface mining of coal.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. An indurated mud having the texture and composition of shale, but lacking its fine lamination or fissility; a blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. A fine grained detrital sedimentary rock, formed by the consolidation of clay, silt, or mud. It is characterized by finely laminated structure, which imparts a fissility approximately parallel to the bedding, along which the rock breaks readily into thin layers. These layers must be less than 5 millimeters thick.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

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.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the periods 1961-90 at Buckeye, West Virginia, and 1976-92 at Snowshoe, West Virginia)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
BUCKEYE:											
January----	37.6	14.5	26.0	61	-18	10	3.42	1.96	4.72	7	10.3
February---	42.6	17.8	30.2	68	-12	25	3.23	1.72	4.55	7	9.6
March------	54.1	26.0	40.0	79	2	111	4.06	2.70	5.31	8	6.5
April------	63.7	33.8	48.8	85	14	280	3.82	2.41	5.09	8	1.7
May--------	72.9	43.4	58.1	88	23	558	4.30	2.67	5.77	8	.0
June-------	79.8	52.1	65.9	90	35	773	3.38	1.97	4.64	7	.0
July-------	82.4	56.8	69.6	92	42	842	4.50	3.34	5.59	9	.0
August-----	81.4	56.0	68.7	91	40	831	3.95	2.17	5.53	7	.0
September--	75.5	49.6	62.5	89	30	646	3.40	1.47	5.05	6	.0
October----	65.4	36.7	51.0	81	14	329	3.58	1.72	5.18	6	.2
November---	53.1	28.2	40.7	74	6	115	3.45	2.09	4.67	7	2.8
December---	41.8	19.8	30.8	66	-8	29	3.73	2.28	5.27	7	7.6
Yearly:											
Average---	62.5	36.2	49.4	---	---	---	---	---	---	---	---
Extreme---	---	---	---	93	-18	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,547	44.82	38.72	49.52	87	38.7
SNOWSHOE:											
January----	27.7	11.2	19.5	51	-23	1	5.29	3.56	6.88	12	47.6
February---	32.5	15.8	24.2	59	-14	14	4.50	3.39	5.54	10	35.1
March------	41.6	24.1	32.9	68	-1	60	5.62	4.30	6.85	10	26.2
April------	51.2	31.7	41.4	74	8	128	4.71	3.04	6.24	9	12.2
May--------	62.4	43.3	52.8	79	23	335	4.20	2.87	5.41	9	.2
June-------	68.4	50.7	59.6	80	32	508	4.53	2.52	6.30	10	.0
July-------	71.9	55.6	63.7	82	30	651	5.92	4.18	7.52	11	.0
August-----	70.9	54.4	62.6	82	38	645	4.92	2.48	7.05	8	.0
September--	64.3	48.3	56.3	78	30	458	3.71	1.70	5.43	6	.0
October----	52.4	35.7	44.0	70	16	175	4.33	2.44	6.54	7	3.1
November---	44.0	28.3	36.1	64	4	73	4.52	3.14	6.34	9	10.9
December---	33.9	17.8	25.9	56	-14	16	4.44	3.18	6.78	9	21.1
Yearly:											
Average---	51.8	34.7	43.3	---	---	---	---	---	---	---	---
Extreme---	---	---	---	83	-25	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,064	56.69	46.69	59.98	110	156.4

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the periods 1961-90 at Buckeye, West Virginia, and 1976-92 at Snowshoe, West Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
BUCKEYE:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 10	May 18	June 2
2 years in 10 later than--	May 4	May 13	May 27
5 years in 10 later than--	Apr. 23	May 3	May 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 3	Sept. 25	Sept. 19
2 years in 10 earlier than--	Oct. 8	Oct. 1	Sept. 23
5 years in 10 earlier than--	Oct. 19	Oct. 11	Oct. 1
SNOWSHOE:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 8	May 19	June 8
2 years in 10 later than--	May 2	May 14	June 2
5 years in 10 later than--	Apr. 19	May 5	May 21
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 8	Sept. 27	Sept. 24
2 years in 10 earlier than--	Oct. 11	Sept. 30	Sept. 27
5 years in 10 earlier than--	Oct. 17	Oct. 6	Oct. 3

Table 3.--Growing Season

(Recorded in the periods 1961-90 at Buckeye, West Virginia, and 1976-92 at Snowshoe, West Virginia)

Probability	Daily minimum temperature during growing season		
	Higher than 24 ^{o}F	Higher than 28 ^{o}F	Higher than 32 ^{o}F
	Days	Days	Days
BUCKEYE:			
9 years in 10	149	141	117
8 years in 10	157	147	124
5 years in 10	172	157	137
2 years in 10	186	168	151
1 year in 10	194	173	158
SNOWSHOE:			
9 years in 10	160	135	105
8 years in 10	165	143	113
5 years in 10	173	157	130
2 years in 10	181	172	147
1 year in 10	186	179	156

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AlB	Allegheny loam, 3 to 8 percent slopes	4,035	0.7
AlC	Allegheny loam, 8 to 15 percent slopes	775	0.1
At	Atkins silt loam	1,475	0.2
BaB	Belmont silt loam, 3 to 8 percent slopes	260	*
BaC	Belmont silt loam, 8 to 15 percent slopes	910	0.2
BaD	Belmont silt loam, 15 to 25 percent slopes	695	0.1
BbC	Belmont silt loam, 3 to 15 percent slopes, very rocky	2,595	0.4
BbE	Belmont silt loam, 15 to 35 percent slopes, very rocky	9,445	1.6
BbF	Belmont silt loam, 35 to 55 percent slopes, very rocky	14,905	2.5
BeB	Berks channery silt loam, 3 to 8 percent slopes	390	0.1
BeC	Berks channery silt loam, 8 to 15 percent slopes	1,540	0.2
BeD	Berks channery silt loam, 15 to 25 percent slopes	2,980	0.5
BeE	Berks channery silt loam, 25 to 35 percent slopes	450	0.1
BfC	Berks channery silt loam, 3 to 15 percent slopes, very stony	1,485	0.2
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	10,930	1.8
BfF	Berks channery silt loam, 35 to 55 percent slopes, very stony	60,755	10.1
BgC	Berks-Dekalb complex, 3 to 15 percent slopes, very stony	2,815	0.5
BgE	Berks-Dekalb complex, 15 to 35 percent slopes, very stony	7,510	1.2
BgF	Berks-Dekalb complex, 35 to 55 percent slopes, very stony	17,750	2.9
BhG	Berks, Weikert, and Calvin soils, 55 to 80 percent slopes, very stony	13,160	2.2
BlC	Blackthorn channery loam, 3 to 15 percent slopes, extremely stony	1,320	0.2
BlE	Blackthorn channery loam, 15 to 35 percent slopes, extremely stony	6,870	1.1
BlF	Blackthorn channery loam, 35 to 55 percent slopes, extremely stony	645	0.1
BoB	Blairton silt loam, 3 to 8 percent slopes	710	0.1
BrF	Briery-Rock outcrop complex, very steep	1,590	0.3
CaC	Calvin channery silt loam, 8 to 15 percent slopes	380	0.1
CbC	Calvin channery silt loam, 3 to 15 percent slopes, very stony	795	0.1
CbE	Calvin channery silt loam, 15 to 35 percent slopes, very stony	3,980	0.7
CbF	Calvin channery silt loam, 35 to 55 percent slopes, very stony	17,395	2.9
CdC	Calvin-Dekalb-Berks complex, 3 to 15 percent slopes, very stony	665	0.1
CdE	Calvin-Dekalb-Berks complex, 15 to 35 percent slopes, very stony	2,280	0.4
CdF	Calvin-Dekalb-Berks complex, 35 to 55 percent slopes, very stony	9,255	1.5
CeB	Cateache channery silt loam, 3 to 8 percent slopes	940	0.2
CeC	Cateache channery silt loam, 8 to 15 percent slopes	1,610	0.3
CeD	Cateache channery silt loam, 15 to 25 percent slopes	1,900	0.3
CfC	Cateache channery silt loam, 3 to 15 percent slopes, very stony	8,505	1.4
CfE	Cateache channery silt loam, 15 to 35 percent slopes, very stony	16,230	2.7
CfF	Catache channery silt loam, 35 to 55 percent slopes, very stony	46,600	7.7
CfG	Cateache channery silt loam, 55 to 80 percent slopes, very stony	1,340	0.2
Ch	Chavies fine sandy loam	2,610	0.4
CuB	Culleoka silt loam, 3 to 8 percent slopes	560	0.1
CuC	Culleoka silt loam, 8 to 15 percent slopes	1,060	0.2
CuD	Culleoka silt loam, 15 to 25 percent slopes	755	0.1
CuE	Culleoka silt loam, 25 to 35 percent slopes	600	0.1
CuF	Culleoka silt loam, 35 to 55 percent slopes	2,005	0.3
DhC	Dekalb-Hazleton complex, 3 to 15 percent slopes, very stony	390	0.1
DhE	Dekalb-Hazleton complex, 15 to 35 percent slopes, very stony	1,280	0.2
DhF	Dekalb-Hazleton complex, 35 to 55 percent slopes, very stony	3,550	0.6
DuB	Duffield silt loam, 3 to 8 percent slopes	1,020	0.2
DuC	Duffield silt loam, 8 to 15 percent slopes	785	0.1
ElF	Elliber extremely channery silt loam, 35 to 55 percent slopes	3,355	0.6
FaC	Faywood silt loam, 3 to 15 percent slopes, very rocky	665	0.1
FaE	Faywood silt loam, 15 to 35 percent slopes, very rocky	2,075	0.3
FaF	Faywood silt loam, 35 to 55 percent slopes, very rocky	1,870	0.3
GaC	Gauley channery sandy loam, 3 to 15 percent slopes, extremely stony	8,000	1.3
GaE	Gauley channery sandy loam, 15 to 35 percent slopes, extremely stony	2,595	0.4
Ho	Holly silt loam	2,620	0.4
LeC	Leatherbark silt loam, 0 to 15 percent slopes, very stony	3,755	0.6
LlB	Lily loam, 3 to 8 percent slopes	4,955	0.8
LlC	Lily loam, 8 to 15 percent slopes	2,585	0.4
LlD	Lily loam, 15 to 25 percent slopes	1,780	0.3
Lo	Lobdell silt loam	1,755	0.3

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
LyB	Lodi silt loam, 3 to 8 percent slopes	1,290	0.2
LyC	Lodi silt loam, 8 to 15 percent slopes	460	0.1
MaB	Macove channery silt loam, 3 to 8 percent slopes	795	0.1
MaC	Macove channery silt loam, 8 to 15 percent slopes	965	0.2
MaD	Macove channery silt loam, 15 to 25 percent slopes	320	0.1
McC	Macove channery silt loam, 3 to 15 percent slopes, very stony	2,285	0.4
McE	Macove channery silt loam, 15 to 35 percent slopes, very stony	1,575	0.3
MdC	Mandy channery silt loam, 8 to 15 percent slopes	590	0.1
MdD	Mandy channery silt loam, 15 to 25 percent slopes	375	0.1
MfC	Mandy channery silt loam, 3 to 15 percent slopes, very stony	14,905	2.5
MfE	Mandy channery silt loam, 15 to 35 percent slopes, very stony	31,670	5.2
MfF	Mandy channery silt loam, 35 to 55 percent slopes, very stony	74,565	12.4
MfG	Mandy channery silt loam, 55 to 80 percent slopes, very stony	2,235	0.4
Mh	Medihemists, very deep	285	*
MrB	Mertz channery silt loam, 3 to 8 percent slopes	475	0.1
MzC	Mertz channery silt loam, 8 to 15 percent slopes, very stony	1,915	0.3
MzE	Mertz channery silt loam, 15 to 35 percent slopes, very stony	1,030	0.2
Or	Orrville silt loam	1,775	0.3
Ph	Philo silt loam	895	0.1
Po	Potomac loam	1,545	0.3
Pt	Potomac very gravelly loam	5,190	0.9
Pu	Purdy silt loam	960	0.2
Sc	Sees silt loam	355	0.1
Se	Sensabaugh silt loam	2,290	0.4
ShB	Shouns silt loam, 3 to 8 percent slopes	2,515	0.4
ShC	Shouns silt loam, 8 to 15 percent slopes	2,125	0.4
SsC	Shouns silt loam, 3 to 15 percent slopes, extremely stony	11,320	1.9
SsE	Shouns silt loam, 15 to 35 percent slopes, extremely stony	18,680	3.1
SsF	Shouns silt loam, 35 to 55 percent slopes, extremely stony	5,760	1.0
SwE	Snowdog silt loam, 15 to 35 percent slopes, extremely stony	18,340	3.0
Tg	Tioga fine sandy loam	2,805	0.5
TrC	Trussel silt loam, 3 to 15 percent slopes, very stony	5,090	0.8
Uf	Udifluvents-Fluvaquents complex	4,175	0.7
Us	Udorthents, smoothed	470	0.1
WeC	Weikert channery silt loam, 8 to 15 percent slopes	2,505	0.4
WeD	Weikert channery silt loam, 15 to 25 percent slopes	10,480	1.7
WeF	Weikert channery silt loam, 25 to 55 percent slopes	40,195	6.7
	Water	900	0.1
	Total	602,600	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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
AlB------------- Allegheny	IIe	115	75	45	3.5	4.5	5.0
AlC------------- Allegheny	IIIe	105	70	40	3.5	4.0	4.5
At-------------- Atkins	IIIw	100	60	30	3.0	---	4.5
BaB------------- Belmont	IIe	120	75	45	3.5	4.5	5.5
BaC------------- Belmont	IIIe	110	70	40	3.0	4.0	4.5
BaD------------- Belmont	IVe	95	60	35	3.0	4.0	4.5
BbC------------- Belmont	VIs	---	---	---	---	---	4.0
BbE, BbF-------- Belmont	VIIs	---	---	---	---	---	---
BeB------------- Berks	IIe	80	60	35	3.0	3.5	4.0
BeC------------- Berks	IIIe	75	55	35	2.5	3.0	4.0
BeD------------- Berks	IVe	70	50	30	2.5	3.0	3.5
BeE------------- Berks	VIe	---	---	---	---	---	2.5
BfC------------- Berks	VIs	---	---	---	---	---	2.5
BfE, BfF-------- Berks	VIIs	---	---	---	---	---	---
BgC------------- Berks-Dekalb	VIs	---	---	---	---	---	2.5
BgE, BgF-------- Berks-Dekalb	VIIs	---	---	---	---	---	---
BhG------------- Berks, Weikert, and Calvin	VIIs	---	---	---	---	---	---
BlC, BlE, BlF--- Blackthorn	VIIs	---	---	---	---	---	---
BoB------------- Blairton	IIw	75	60	35	2.5	3.0	5.0

See footnote 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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
BrF------------- Briery-Rock outcrop	VIIs	---	---	---	---	---	---
CaC------------- Calvin	IIIe	75	55	35	2.5	3.0	4.0
CbC------------- Calvin	VIs	---	---	---	---	---	2.5
CbE, CbF-------- Calvin	VIIs	---	---	---	---	---	---
CdC------------- Calvin-Dekalb-Berks	VIs	---	---	---	---	---	2.5
CdE, CdF-------- Calvin-Dekalb-Berks	VIIs	---	---	---	---	---	---
CeB------------- Cateache	IIe	95	70	40	3.5	4.0	4.5
CeC------------- Cateache	IIIe	90	65	35	3.0	4.0	4.5
CeD------------- Cateache	IVe	85	60	30	2.5	3.5	4.0
CfC------------- Cateache	VIs	---	---	---	---	---	3.0
CfE, CfF, CfG--- Cateache	VIIs	---	---	---	---	---	---
Ch-------------- Chavies	I	120	80	45	4.0	5.0	5.0
CuB------------- Culleoka	IIe	100	75	45	4.0	4.5	4.5
CuC------------- Culleoka	IIIe	95	70	40	3.5	4.0	4.5
CuD------------- Culleoka	IVe	90	65	35	2.5	3.5	4.0
CuE------------- Culleoka	VIe	---	---	---	---	---	3.5
CuF------------- Culleoka	VIIe	---	---	---	---	---	---
DhC------------- Dekalb-Hazleton	VIs	---	---	---	---	---	2.5
DhE, DhF-------- Dekalb-Hazleton	VIIs	---	---	---	---	---	---

See footnote 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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
DuB------------- Duffield	IIe	130	80	50	3.5	5.0	5.5
DuC------------- Duffield	IIIe	125	75	45	3.0	4.5	5.0
ElF------------- Elliber	VIIs	---	---	---	---	---	---
FaC, FaE-------- Faywood	VIs	---	---	---	---	---	3.0
FaF------------- Faywood	VIIs	---	---	---	---	---	---
GaC------------- Gauley	VIIs	---	---	---	---	---	---
GaE------------- Gauley	VIIs	---	---	---	---	---	---
Ho-------------- Holly	IIIw	100	70	35	3.0	---	4.5
LeC------------- Leatherbark	VIs	---	---	---	---	---	2.5
LlB------------- Lily	IIe	95	70	40	3.5	4.0	4.5
LlC------------- Lily	IIIe	85	65	35	3.0	3.5	4.0
LlD------------- Lily	IVe	80	60	30	2.5	3.0	3.5
Lo-------------- Lobdell	IIw	120	75	45	3.5	4.5	5.0
LyB------------- Lodi	IIe	135	85	50	4.0	5.0	6.0
LyC------------- Lodi	IIIe	130	80	45	3.5	4.5	5.5
MaB------------- Macove	IIe	90	70	40	3.0	3.5	4.5
MaC------------- Macove	IIIe	85	65	35	3.0	3.5	4.0
MaD------------- Macove	IVe	75	60	30	3.0	3.5	3.5
McC------------- Macove	VIs	---	---	---	---	---	3.5
McE------------- Macove	VIIs	---	---	---	---	---	---
MdC------------- Mandy	IIIe	---	---	---	---	---	3.5

See footnote 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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
MdD------------- Mandy	IVe	---	---	---	---	---	3.0
MfC------------- Mandy	VIs	---	---	---	---	---	2.0
MfE, MfF, MfG--- Mandy	VIIs	---	---	---	---	---	---
Mh. Medihemists							
MrB------------- Mertz	IIe	110	70	40	3.5	4.5	5.0
MzC------------- Mertz	VIs	---	---	---	---	---	4.0
MzE------------- Mertz	VIIs	---	---	---	---	---	---
Or-------------- Orrville	IIw	110	75	45	3.5	---	5.0
Ph-------------- Philo	IIw	110	75	45	3.5	4.5	5.0
Po-------------- Potomac	IVs	85	60	---	2.5	3.0	3.5
Pt-------------- Potomac	Vs	---	---	---	2.0	2.5	3.0
Pu-------------- Purdy	IVw	80	55	40	2.5	---	3.0
Sc-------------- Sees	IIIw	80	55	40	3.0	---	3.5
Se-------------- Sensabaugh	IIw	110	75	45	3.5	4.5	5.0
ShB------------- Shouns	IIe	120	80	50	4.0	5.0	5.5
ShC------------- Shouns	IIIe	115	75	45	3.5	4.5	5.0
SsC, SsE, SsF--- Shouns	VIIs	---	---	---	---	---	---
SwE------------- Snowdog	VIIs	---	---	---	---	---	---
Tg-------------- Tioga	I	120	80	45	4.0	5.0	5.0
TrC------------- Trussel	VIs	---	---	---	---	---	2.0

See footnote 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	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
Uf*. Udlfluvents-Fluvaquents							
Us. Udorthents							
WeC------------- Weikert	IVe	60	45	20	2.0	2.0	3.0
WeD------------- Weikert	VIe	---	---	---	---	---	2.0
WeF------------- Weikert	VIIe	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6.--Capability Classes and Subclasses

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	5,415	---	---	---
II	24,660	17,235	7,425	---
III	18,235	13,785	4,450	---
IV	13,815	11,310	960	1,545
V	5,190	---	---	5,190
VI	59,470	11,530	---	47,940
VII	469,985	42,200	---	427,785
VIII	---	---	---	---

Table 7.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
AlB	Allegheny loam, 3 to 8 percent slopes
BaB	Belmont silt loam, 3 to 8 percent slopes
CeB	Cateache channery silt loam, 3 to 8 percent slopes
Ch	Chavies fine sandy loam
CuB	Culleoka silt loam, 3 to 8 percent slopes
DuB	Duffield silt loam, 3 to 8 percent slopes
LlB	Lily loam, 3 to 8 percent slopes
Lo	Lobdell silt loam
MaB	Macove channery silt loam, 3 to 8 percent slopes
MrB	Mertz channery silt loam, 3 to 8 percent slopes
Ph	Philo silt loam
Se	Sensabaugh silt loam
ShB	Shouns silt loam, 3 to 8 percent slopes
Tg	Tioga fine sandy loam

Table 8.--Woodland Management

(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	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
AlB: Allegheny	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
AlC: Allegheny	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: slope.	Slight.
At: Atkins	Slight	Severe: wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.
BaB: Belmont	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
BaC: Belmont	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
BaD: Belmont (north aspect)	Moderate: slope.	Slight	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
BaD: Belmont (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
BbC: Belmont	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
BbE: Belmont (north aspect)	Moderate: slope.	Slight	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
BbE: Belmont (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
BbF: Belmont (north aspect)	Severe: slope.	Slight	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
BbF: Belmont (south aspect)	Severe: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
BeB: Berks	Slight	Moderate: rock fragments.	Slight	Slight	Slight	Slight.
BeC: Berks	Slight	Moderate: rock fragments.	Slight	Slight	Moderate: slope.	Slight.
BeD: Berks (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
BeD-------------- Berks (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
BeE-------------- Berks (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
BeE-------------- Berks (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
BfC-------------- Berks	Slight----	Moderate: rock fragments.	Slight-------------	Slight---------	Moderate: slope.	Slight.
BfE-------------- Berks (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
BfE-------------- Berks (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
BfF-------------- Berks (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight-------------	Severe: slope.	Severe: slope.	Severe: slope.
BfF-------------- Berks (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight-------------	Severe: slope.	Severe: slope.	Severe: slope.
BgC***:						
Berks-----------	Slight----	Moderate: rock fragments.	Slight-------------	Slight---------	Moderate: slope.	Slight.
Dekalb----------	Slight----	Moderate: rock fragments.	Slight-------------	Moderate: depth to rock.	Moderate: depth to rock, slope.	Slight.
BgE***:						
Berks----------- (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.
Dekalb---------- (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight-------------	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
BgE***:						
Berks----------- (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight-------------	Moderate: slope.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
BgE***:						
Dekalb (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
BgF***:						
Berks (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
BgF***:						
Berks (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
BhG***:						
Berks (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Weikert (north aspect)	Severe: slope.	Moderate: rock fragments, restrictive layer.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Calvin (north aspect)	Severe: slope.	Moderate: rock fragments.	Moderate	Severe: slope.	Severe: slope.	Severe: slope.
BhG***:						
Berks (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Weikert (south aspect)	Severe: slope.	Moderate: rock fragments, restrictive layer, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Calvin (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
BlC: Blackthorn	Slight	Slight	Moderate: high productivity.	Moderate: too stony.	Moderate: too stony, slope.	Slight.
BlE: Blackthorn	Moderate: slope.	Slight	Moderate: high productivity.	Moderate: slope, too stony.	Severe: slope.	Moderate: slope.
BlF: Blackthorn	Severe: slope.	Slight	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
BoB: Blairton	Slight	Slight	Severe: wetness.	Moderate: wetness, low strength.	Moderate: wetness, low strength.	Slight.
BrF***:						
Briery	Severe: slope.	Severe: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
CaC: Calvin	Slight	Moderate: rock fragments.	Slight	Moderate: low strength.	Moderate: low strength, slope.	Slight.
CbC: Calvin	Slight	Moderate: rock fragments.	Slight	Moderate: low strength.	Moderate: low strength, slope.	Slight.
CbE: Calvin (north aspect)	Moderate: slope.	Moderate: rock fragments.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
CbE: Calvin (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
CbF: Calvin (north aspect)	Severe: slope.	Moderate: rock fragments.	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
CbF: Calvin (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
CdC***:						
Calvin	Slight	Moderate: rock fragments.	Slight	Moderate: low strength.	Moderate: low strength.	Slight.
Dekalb	Slight	Moderate: rock fragments.	Slight	Moderate: depth to rock.	Moderate: depth to rock, slope.	Slight.
Berks	Slight	Moderate: rock fragments.	Slight	Slight	Moderate: slope.	Slight.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
CdE***:						
Calvin (north aspect)	Moderate: slope.	Moderate: rock fragments.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
Dekalb (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
Berks (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight	Moderate: slope.	Severe: slope.	Moderate: slope.
CdE***:						
Calvin (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
Dekalb (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
Berks (south aspect)	Moderate: slope.	Moderate: rock fragments, slope.	Slight	Moderate: slope.	Severe: slope.	Moderate: slope.
CdF***:						
Calvin (north aspect)	Severe: slope.	Moderate: rock fragments.	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Berks (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
CdF***:						
Calvin (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
Berks (south aspect)	Severe: slope.	Moderate: rock fragments, slope.	Slight	Severe: slope.	Severe: slope.	Severe: slope.
CeB Cateache	Slight	Slight	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
CeC------------- Cateache	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
CeD------------- Cateache (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Severe: slippage.	Severe: slope, slippage.	Severe: slippage.
CeD------------- Cateache (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slippage.	Severe: slope, slippage.	Severe: slippage.
CfC------------- Cateache	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
CfE------------- Cateache (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Severe: slippage.	Severe: slope, slippage.	Severe: slippage.
CfE------------- Cateache (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slippage.	Severe: slope, slippage.	Severe: slippage.
CfF------------- Cateache (north aspect)	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
CfF------------- Cateache (south aspect)	Severe: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
CfG------------- Cateache (north aspect)	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
CfG------------- Cateache (south aspect)	Severe: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
Ch-------------- Chavies	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
CuB------------- Culleoka	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
CuC------------- Culleoka	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
CuD------------- Culleoka (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
CuD------------- Culleoka (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
CuE------------- Culleoka (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
CuE-------------- Culleoka (south aspect)	Moderate: slope.	Moderate: slope.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
CuF-------------- Culleoka (north aspect)	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
CuF-------------- Culleoka (south aspect)	Severe: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
DhC***:						
Dekalb----------	Severe----	Moderate: rock fragments.	Slight------------	Moderate: depth to rock.	Moderate: depth to rock, slope.	Slight.
Hazleton--------	Slight----	Slight-------	Moderate: high productivity.	Slight---------	Moderate: slope.	Slight.
DhE***:						
Dekalb---------- (north aspect)	Moderate: slope.	Moderate: rock fragments.	Slight------------	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
Hazleton-------- (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope.	Severe: slope.	Moderate: slope.
DhE***:						
Dekalb---------- (south aspect)	Moderate: slope.	Moderate: rock fragments.	Slight------------	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.
Hazleton-------- (south aspect)	Moderate: slope.	Moderate: slope.	Slight------------	Moderate: slope.	Severe: slope.	Moderate: slope.
DhF***:						
Dekalb---------- (north aspect)	Severe: slope.	Moderate: rock fragments.	Slight------------	Severe: slope.	Severe: slope.	Severe: slope.
Hazleton-------- (north aspect)	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
DhF***:						
Dekalb---------- (south aspect)	Severe: slope.	Moderate: rock fragments.	Slight------------	Severe: slope.	Severe: slope.	Severe: slope.
Hazleton-------- (south aspect)	Severe: slope.	Moderate: slope.	Slight------------	Severe: slope.	Severe: slope.	Severe: slope.
DuB-------------- Duffield	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
DuC-------------- Duffield	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
ElF: Elliber (north aspect)	Severe: slope.	Slight	Severe: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
ElF: Elliber (south aspect)	Severe: slope.	Moderate: slope.	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
FaC: Faywood	Slight	Slight	Moderate: high productivity.	Moderate: low strength, depth to rock.	Moderate: depth to rock, low strength, slope.	Slight.
FaE: Faywood	Moderate: slope.	Slight	Moderate: high productivity.	Severe: low strength.	Severe: low strength, slope.	Moderate: slope.
FaF: Faywood	Severe: slope.	Slight	Moderate: high productivity.	Severe: slope, low strength.	Severe: low strength, slope.	Severe: slope.
GaC: Gauley	Slight	Moderate: rock fragments.	Severe: high productivity.	Moderate: too stony. depth to rock.	Moderate: too stony, depth to rock, slope.	Slight.
GaE: Gauley	Moderate: slope.	Moderate: rock fragments.	Severe: high productivity.	Moderate: slope, too stony, depth to rock.	Severe: slope.	Moderate: slope.
Ho: Holly	Slight	Moderate: wetness.	Severe: wetness, high productivity.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.
LeC: Leatherbark	Slight	Slight	Severe: high productivity.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
LlB: Lily	Slight	Slight	Slight	Moderate: low strength, depth to rock.	Moderate: depth to rock, low strength.	Slight.
LlC: Lily	Slight	Slight	Slight	Moderate: low strength, depth to rock.	Moderate: depth to rock, low strength, slope.	Slight.
LlD: Lily	Moderate: slope.	Slight	Slight	Moderate: slope, low strength, depth to rock.	Severe: slope.	Moderate: slope.
Lo: Lobdell	Slight	Slight	Severe: high productivity.	Moderate: low strength, flooding.	Moderate: low strength, flooding.	Moderate: flooding.
LyB: Lodi	Slight	Slight	Severe: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
LyC------------- Lodi	Slight----	Slight-------	Severe: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
MaB------------- Macove	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
MaC------------- Macove	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
MaD------------- Macove (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
MaD------------- Macove (south aspect)	Moderate: slope.	Moderate: slope.	Slight------------	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
McC------------- Macove	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
McE------------- Macove (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
McE------------- Macove (south aspect)	Moderate: slope.	Moderate: slope.	Slight------------	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.
MdC------------- Mandy	Slight----	Slight-------	Moderate: high productivity.	Slight---------	Moderate: slope.	Slight.
MdD------------- Mandy	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope,	Severe: slope.	Moderate: slope.
MfC------------- Mandy	Slight----	Slight-------	Moderate: high productivity.	Slight---------	Moderate: slope.	Slight.
MfE------------- Mandy	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope.	Severe: slope.	Moderate: slope.
MfF------------- Mandy	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
MfG------------- Mandy	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope.	Severe: slope.	Severe: slope.
MrB------------- Mertz	Slight----	Moderate: rock fragments.	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
MzC------------- Mertz	Slight----	Moderate: rock fragments.	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
MzE------------- Mertz	Moderate: slope.	Moderate: rock fragments.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
Or--------------- Orville	Slight----	Slight-------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ph--------------- Philo	Slight----	Slight-------	Severe: high productivity.	Moderate: low strength, flooding.	Moderate: low strength, flooding.	Moderate: flooding.
Po--------------- Potomac	Slight----	Moderate: droughty.	Moderate: high productivity.	Moderate: too cobbly, flooding.	Moderate: flooding, too cobbly.	Moderate: flooding.
Pt--------------- Potomac	Slight----	Moderate: droughty, rock fragments.	Moderate: high productivity.	Moderate: too cobbly, flooding.	Moderate: flooding, too cobbly.	Moderate: flooding.
Pu--------------- Purdy	Slight----	Moderate: wetness.	Severe: wetness, high productivity.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sc--------------- Sees	Slight----	Slight-------	Severe: wetness, high productivity.	Severe: low strength.	Severe: low strength.	Slight.
Se--------------- Sensabaugh	Slight----	Slight-------	Severe: high productivity.	Moderate: low strength, flooding.	Moderate: flooding, low strength.	Moderate: flooding.
ShB-------------- Shouns	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength.	Slight.
ShC-------------- Shouns	Slight----	Slight-------	Moderate: high productivity.	Moderate: low strength.	Moderate: low strength, slope.	Slight.
SsC-------------- Shouns	Slight----	Slight-------	Moderate: high productivity.	Moderate: too stony, low strength.	Moderate: too stony, low strength, slope.	Slight.
SsE-------------- Shouns (north aspect)	Moderate: slope.	Slight-------	Moderate: high productivity.	Moderate: slope, too stony, low strength.	Severe: slope.	Moderate: slope.
SsE-------------- Shouns (south aspect)	Moderate: slope.	Moderate: slope.	Slight-------------	Moderate: slope, too stony, low strength.	Severe: slope.	Moderate: slope.
SsF-------------- Shouns (north aspect)	Severe: slope.	Slight-------	Moderate: high productivity.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
SsF-------------- Shouns (south aspect)	Severe: slope.	Moderate: slope.	Slight-------------	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.
SwE-------------- Snowdog	Moderate: slope.	Moderate: restrictive layer.	Moderate: high productivity.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope.

See footnotes at end of table.

Table 8.--Woodland Management--Continued

Soil name and map symbol	Erosion hazard*	Seedling mortality*	Plant competition*	Haul roads and skid roads**	Log landings**	Operability of equipment in logging areas**
Tg: Tioga	Slight	Slight	Moderate: high productivity.	Moderate: low strength. flooding.	Moderate: flooding, low strength.	Moderate: flooding.
TrC: Trussel	Slight	Moderate: wetness, restrictive layer.	Severe: wetness, high productivity.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WeC: Weikert	Slight	Moderate: rock fragments, restrictive layer.	Slight	Slight	Moderate: slope.	Slight.
WeD: Weikert (north aspect)	Moderate: slope.	Moderate: rock fragments, restrictive layer.	Slight	Moderate: slope.	Severe: slope,	Moderate: slope.
WeD: Weikert (south aspect)	Moderate: slope.	Moderate: rock fragments, restrictive layer, slope.	Slight	Moderate: slope.	Severe: slope,	Moderate: slope.
WeF: Weikert (north aspect)	Severe: slope.	Moderate: rock fragments, restrictive layer.	Slight	Severe: slope.	Severe: slope,	Severe: slope.
WeF: Weikert (south aspect)	Severe: slope.	Moderate: rock fragments, restrictive layer, slope.	Slight	Severe: slope.	Severe: slope,	Severe: slope.

* The ratings for erosion hazard, seeding mortality, and plant competition are from criteria in the "National Forestry Manual."

** The ratings for haul roads and skid roads, log landings, and equipment operability are from criteria jointly prepared by the Natural Resources Conservation Service and the Forest Service for this soil survey.

*** See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.--Woodland 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	Ordination symbol*	Potential productivity: Commonly grown trees	Potential productivity: Site index	Average annual growth in**--: Cubic feet per acre	Average annual growth in**--: Board feet per acre	Average annual growth in**--: Cords per acre
AlB: Allegheny	4A	Northern red oak	80	62	250	0.81
		Eastern white pine	90	166	---	---
		White oak	75	57	215	0.74
AlC: Allegheny	4A	Northern red oak	80	62	250	0.81
		Eastern white pine	90	166	---	---
		White oak	75	57	215	0.74
At: Atkins	4W	Pin oak	80	62	250	0.81
		American sycamore	---	---	---	---
		River birch	---	---	---	---
		Red maple	---	---	---	---
		Eastern white pine	---	---	---	---
BaB: Belmont	4A	Northern red oak	77	59	229	0.77
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
		Black walnut	---	---	---	---
BaC: Belmont	4A	Northern red oak	77	59	229	0.77
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
		Black walnut	---	---	---	---
BaD: Belmont (north aspect)	4R	Northern red oak	80	62	250	0.81
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
		Black walnut	---	---	---	---
BaD: Belmont (south aspect)	4R	Northern red oak	74	56	208	0.73
		White oak	74	56	208	0.73
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	70	43	---	---
BbC: Belmont	4A	Northern red oak	77	59	229	0.77
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	---	---	---	---
		Black walnut	---	---	---	---
BbE: Belmont (north aspect)	4R	Northern red oak	80	62	250	0.81
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
		Black walnut	---	---	---	---
BbE: Belmont (south aspect)	4R	Northern red oak	74	56	208	0.73
		White oak	74	56	208	0.73
		Hickory	---	---	---	---
		American beech	---	---	---	---
		Sugar maple	70	43	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
BbF------------- Belmont (north aspect)	4R	Northern red oak----	80	62	250	0.81
		Hickory-------------	---	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	80	50	---	---
		Black walnut--------	---	---	---	---
BbF------------- Belmont (south aspect)	4R	Northern red oak----	74	56	208	0.73
		White oak-----------	74	56	208	0.73
		Hickory-------------	---	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	70	43	---	---
BeB------------- Berks	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
		Chestnut oak--------	60	43	110	0.52
BeC------------- Berks	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
		Chestnut oak--------	60	43	110	0.52
BeD------------- Berks (north aspect)	3R	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
BeD------------- Berks (south aspect)	3R	Northern red oak----	55	38	85	0.45
		White oak-----------	55	38	85	0.45
		Hickory-------------	---	---	---	---
		Eastern white pine--	60	97	---	---
		Chestnut oak--------	55	38	85	0.45
BeE------------- Berks (north aspect)	3R	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
BeE------------- Berks (south aspect)	3R	Northern red oak----	55	38	85	0.45
		White oak-----------	55	38	85	0.45
		Hickory-------------	---	---	---	---
		Eastern white pine--	60	97	---	---
		Chestnut oak--------	55	38	85	0.45
BfC------------- Berks	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
		Chestnut oak--------	60	43	110	0.52

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
BfE-------------	3R	Northern red oak----	65	48	145	0.60
Berks		White oak-----------	65	48	145	0.60
(north aspect)		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
BfE-------------	3R	Northern red oak----	55	38	85	0.45
Berks		White oak-----------	55	38	85	0.45
(south aspect)		Hickory-------------	---	---	---	---
		Eastern white pine--	60	97	---	---
		Chestnut oak--------	55	38	85	0.45
BfF-------------	3R	Northern red oak----	65	48	145	0.60
Berks		White oak-----------	65	48	145	0.60
(north aspect)		Hickory-------------	---	---	---	---
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
BfF-------------	3R	Northern red oak----	55	38	85	0.45
Berks		White oak-----------	55	38	85	0.45
(south aspect)		Hickory-------------	---	---	---	---
		Eastern white pine--	60	97	---	---
		Chestnut oak--------	55	38	85	0.45
BgC***:						
Berks----------	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Chestnut oak--------	60	43	110	0.52
Dekalb---------	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Chestnut oak--------	60	43	110	0.52
BgE***:						
Berks----------	3R	Northern red oak----	65	48	145	0.60
(north aspect)		White oak-----------	65	48	145	0.60
		Red maple-----------	---	---	---	---
		Yellow buckeye------	---	---	---	---
		Black cherry--------	---	---	---	---
Dekalb---------	3R	Northern red oak----	60	43	110	0.52
(north aspect)		White oak-----------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Yellow buckeye------	---	---	---	---
BgE***:						
Berks----------	3R	Northern red oak----	55	38	85	0.45
(south aspect)		White oak-----------	55	38	85	0.45
		Red maple-----------	---	---	---	---
		Chestnut oak--------	55	38	85	0.45
Dekalb---------	2R	Northern red oak----	50	34	60	0.38
(south aspect)		White oak-----------	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Red maple-----------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
BgF***:						
Berks---------- (north aspect)	3R	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Red maple-----------	---	---	---	---
		Yellow buckeye------	---	---	---	---
		Black cherry--------	---	---	---	---
Dekalb--------- (north aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Yellow buckeye------	---	---	---	---
BgF***:						
Berks---------- (south aspect)	3R	Northern red oak----	55	38	85	0.45
		White oak-----------	55	38	85	0.45
		Red maple-----------	---	---	---	---
		Chestnut oak--------	55	38	85	0.45
Dekalb--------- (south aspect)	2R	Northern red oak----	50	34	60	0.38
		White oak-----------	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Red maple-----------	---	---	---	---
BhG***:						
Berks---------- (north aspect)	3R	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
		Hickory-------------	---	---	---	---
Weikert-------- (north aspect)	2R	Northern red oak----	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Scarlet oak---------	50	34	60	0.38
		White oak-----------	50	34	60	0.38
		Pitch pine----------	50	---	---	---
		Hickory-------------	---	---	---	---
Calvin--------- (north aspect)	4R	Northern red oak----	70	52	180	0.67
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Red maple-----------	---	---	---	---
		Hickory-------------	---	---	---	---
BhG***:						
Berks---------- (south aspect)	3R	Northern red oak----	55	38	85	0.45
		White oak-----------	55	38	85	0.45
		Hickory-------------	---	---	---	---
		Chestnut oak--------	55	38	85	0.45
		Eastern white pine--	60	97	---	---
Weikert-------- (south aspect)	2R	Northern red oak----	40	26	---	---
		Chestnut oak--------	40	26	---	---
		Pitch pine----------	40	---	---	---
		Hickory-------------	---	---	---	---
		Scarlet oak---------	40	26	---	---
		White oak-----------	40	26	---	---
Calvin--------- (south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Hickory-------------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
BlC------------- Blackthorn	4X	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	80	144	---	---
		Cucumbertree--------	75	---	---	---
		Black locust--------	---	---	---	---
BlE------------- Blackthorn	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	80	144	---	---
		Cucumbertree--------	75	---	---	---
		Black locust--------	---	---	---	---
BlF------------- Blackthorn	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	80	144	---	---
		Cucumbertree--------	75	---	---	---
		Black locust--------	---	---	---	---
BoB------------- Blairton	4A	Northern red oak----	70	52	180	0.67
		White ash-----------	70	75	---	---
		Yellow-poplar-------	80	71	320	0.83
BrF***:						
Briery---------	4R	Red pine------------	45	54	---	---
		Scotch pine---------	45	---	---	---
		Black locust--------	---	---	---	---
Rock outcrop.						
CaC------------- Calvin	3A	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---
CbC------------- Calvin	3A	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---
CbE------------- Calvin (north aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---
CbE------------- Calvin (south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
CbF------------- Calvin (north aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
CbF------------- Calvin (south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
CdC***:						
Calvin---------	3A	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---
Dekalb---------	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Chestnut oak--------	60	43	110	0.52
		Pitch pine----------	---	---	---	---
Berks----------	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Chestnut oak--------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Eastern white pine--	70	121	---	---
CdE***:						
Calvin--------- (north aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
		Black locust--------	---	---	---	---
Dekalb--------- (north aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
Berks---------- (north aspect)	3R	Northern red oak----	65	48	145	0.60
		White oak-----------	65	48	145	0.60
		Eastern white pine--	70	121	---	---
		Red maple-----------	---	---	---	---
CdE***:						
Calvin--------- (south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Pitch pine----------	---	---	---	---
Dekalb--------- (south aspect)	2R	Northern red oak----	50	34	60	0.38
		White oak-----------	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Pitch pine----------	---	---	---	---
Berks---------- (south aspect)	3R	Northern red oak----	55	38	85	0.45
		White oak-----------	55	38	85	0.45
		Chestnut oak--------	55	38	85	0.45
		Pitch pine----------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
CdF***:						
Calvin (north aspect)	4R	Northern red oak	70	52	180	0.67
		White oak	70	52	180	0.67
		Hickory	---	---	---	---
		Red maple	---	---	---	---
		Black locust	---	---	---	---
Dekalb (north aspect)	3R	Northern red oak	60	43	110	0.52
		White oak	60	43	110	0.52
		Hickory	---	---	---	---
		Red maple	---	---	---	---
Berks (north aspect)	3R	Northern red oak	65	48	145	0.60
		White oak	65	48	145	0.60
		Eastern white pine	70	---	---	---
		Red maple	---	---	---	---
CdF***:						
Calvin (south aspect)	3R	Northern red oak	60	43	110	0.52
		White oak	60	43	110	0.52
		Hickory	---	---	---	---
		Pitch pine	---	---	---	---
Dekalb (south aspect)	2R	Northern red oak	50	34	60	0.38
		White oak	50	34	60	0.38
		Chestnut oak	50	34	60	0.38
		Pitch pine	---	---	---	---
Berks (south aspect)	3R	Northern red oak	55	38	85	0.45
		White oak	55	38	85	0.45
		Chestnut oak	55	38	85	0.45
		Pitch pine	---	---	---	---
CeB Cateache	4A	Northern red oak	80	62	250	0.81
		Black cherry	80	50	---	---
		Cucumbertree	80	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
CeC Cateache	4A	Northern red oak	80	62	250	0.81
		Black cherry	80	50	---	---
		Cucumbertree	80	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
CeD Cateache (north aspect)	4R	Northern red oak	80	62	250	0.81
		Black cherry	80	50	---	---
		Cucumbertree	80	---	---	---
		American beech	---	---	---	---
		Sugar maple	80	50	---	---
CeD Cateache (south aspect)	4R	Northern red oak	70	52	180	0.67
		Black cherry	70	43	---	---
		Cucumbertree	70	---	---	---
		American beech	---	---	---	---
		Sugar maple	70	43	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
CfC------------ Cateache	4A	Northern red oak----	80	62	250	0.81
		Black cherry--------	80	50	---	---
		Cucumbertree--------	80	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	80	50	---	---
CfE------------ Cateache (north aspect)	4R	Northern red oak----	80	62	250	0.81
		Black cherry--------	80	50	---	---
		Cucumbertree--------	80	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	80	50	---	---
		White ash-----------	---	---	---	---
		American basswood---	---	---	---	---
		Red spruce----------	---	---	---	---
CfE------------ Cateache (south aspect)	4R	Northern red oak----	70	52	180	0.67
		Black cherry--------	70	43	---	---
		Cucumbertree--------	70	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	70	43	---	---
		Red spruce----------	---	---	---	---
CfF------------ Cateache (north aspect)	4R	Northern red oak----	80	62	250	0.81
		Black cherry--------	80	50	---	---
		Cucumbertree--------	80	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	80	50	---	---
		White ash-----------	---	---	---	---
		American basswood---	---	---	---	---
		Red spruce----------	---	---	---	---
CfF------------ Cateache (south aspect)	4R	Northern red oak----	70	52	180	0.67
		Black cherry--------	70	43	---	---
		Cucumbertree--------	70	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	70	43	---	---
		Red spruce----------	---	---	---	---
CfG------------ Cateache (north aspect)	4R	Northern red oak----	80	62	250	0.81
		Black cherry--------	80	50	---	---
		Cucumbertree--------	80	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	80	50	---	---
		White ash-----------	---	---	---	---
		American basswood---	---	---	---	---
		Red spruce----------	---	---	---	---
CfG------------ Cateache (south aspect)	4R	Northern red oak----	70	52	180	0.67
		Black cherry--------	70	43	---	---
		Cucumbertree--------	70	---	---	---
		American beech------	---	---	---	---
		Sugar maple---------	70	43	---	---
		Red spruce----------	---	---	---	---
Ch------------- Chavies	4A	Northern red oak----	80	62	250	0.81
		Yellow-poplar-------	90	90	440	1.04
		Red maple-----------	---	---	---	---
		American sycamore---	---	---	---	---
		Eastern white pine--	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
CuB------------- Culleoka	4A	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
		Hickory-------------	---	---	---	---
CuC------------- Culleoka	4A	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
		Hickory-------------	---	---	---	---
CuD------------- Culleoka (north aspect)	4R	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
		Eastern hemlock-----	---	---	---	---
CuD------------- Culleoka (south aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
CuE------------- Culleoka (north aspect)	4R	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
		Eastern hemlock-----	---	---	---	---
CuE------------- Culleoka (south aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
CuF------------- Culleoka (north aspect)	4R	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
		Eastern hemlock-----	---	---	---	---
CuF------------- Culleoka (south aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Hickory-------------	---	---	---	---
		American beech------	---	---	---	---
		American basswood---	---	---	---	---
DhC***:						
Dekalb---------	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Chestnut oak--------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
Hazleton-------	4A	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
DhE***:						
Dekalb---------(north aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Eastern white pine--	---	---	---	---
Hazleton-------(north aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Red maple-----------	---	---	---	---
		Eastern white pine--	---	---	---	---
		Eastern hemlock-----	---	---	---	---
DhE***:						
Dekalb---------(south aspect)	2R	Northern red oak----	50	34	60	0.38
		White oak-----------	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
Hazleton-------(south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
DhF***:						
Dekalb---------(north aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Red maple-----------	---	---	---	---
		Eastern white pine--	---	---	---	---
Hazleton-------(north aspect)	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Red maple-----------	---	---	---	---
		Eastern white pine--	---	---	---	---
		Eastern hemlock-----	---	---	---	---
DhF***:						
Dekalb---------(south aspect)	2R	Northern red oak----	50	34	60	0.38
		White oak-----------	50	34	60	0.38
		Chestnut oak--------	50	34	60	0.38
		Hickory-------------	---	---	---	---
		Red maple-----------	---	---	---	---
Hazleton-------(south aspect)	3R	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
DuB-------------Duffield	4A	Northern red oak----	79	61	243	0.80
		White oak-----------	80	62	250	0.81
		Hickory-------------	---	---	---	---
		Black locust--------	---	---	---	---
		Red maple-----------	---	---	---	---
DuC-------------Duffield	4A	Northern red oak----	79	61	243	0.80
		White oak-----------	80	62	250	0.81
		Hickory-------------	---	---	---	---
		Black locust--------	---	---	---	---
		Red maple-----------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
ElF------------- Elliber (north aspect)	5R	Northern red oak----	85	67	285	0.88
		Red maple-----------	---	---	---	---
		Hickory-------------	---	---	---	---
		Eastern white pine--	95	176	---	---
		Eastern hemlock-----	---	---	---	---
ElF------------- Elliber (south aspect)	4R	Northern red oak----	80	62	250	0.81
		Hickory-------------	---	---	---	---
		Chestnut oak--------	80	62	250	0.81
		Eastern white pine--	90	166	---	---
		Pitch pine----------	---	---	---	---
FaC------------- Faywood	4A	Northern red oak----	70	52	180	0.67
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	75	132	---	---
		Black locust--------	---	---	---	---
FaE------------- Faywood	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	75	132	---	---
		Black locust--------	---	---	---	---
FaF------------- Faywood	4R	Northern red oak----	70	52	180	0.67
		White oak-----------	60	43	110	0.52
		Hickory-------------	---	---	---	---
		Eastern white pine--	75	132	---	---
		Black locust--------	---	---	---	---
GaC------------- Gauley	6X	Red spruce----------	42	88	---	---
		Yellow birch--------	---	---	---	---
		Red maple-----------	---	---	---	---
		Bigtooth aspen------	---	---	---	---
GaE------------- Gauley	6R	Red spruce----------	42	88	---	---
		Yellow birch--------	---	---	---	---
		Red maple-----------	---	---	---	---
		Bigtooth aspen------	---	---	---	---
Ho-------------- Holly	5W	Pin oak-------------	90	72	320	0.95
		American sycamore---	---	---	---	---
		River birch---------	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern white pine--	---	---	---	---
LeC------------- Leatherbark	7W	Red spruce----------	45	95	---	---
		Black cherry--------	70	43	---	---
		American beech------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red maple-----------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
LlB------------- Lily	3A	Northern red oak----	60	43	110	0.52
		White oak-----------	60	43	110	0.52
		Scarlet oak---------	60	43	110	0.52
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
LlC-------------	3A	Northern red oak----	60	43	110	0.52
Lily		White oak-----------	60	43	110	0.52
		Scarlet oak---------	60	43	110	0.52
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
LlD-------------	3R	Northern red oak----	60	43	110	0.52
Lily		White oak-----------	60	43	110	0.52
		Scarlet oak---------	60	43	110	0.52
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
Lo--------------	5A	Northern red oak----	87	69	299	0.91
Lobdell		White oak-----------	85	67	285	0.88
		Eastern white pine--	---	---	---	---
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---
LyB-------------	5A	Northern red oak----	85	67	285	0.88
Lodi		Hickory-------------	---	---	---	---
		Black locust--------	---	---	---	---
		Black walnut--------	---	---	---	---
LyC-------------	5A	Northern red oak----	85	67	285	0.88
Lodi		Hickory-------------	---	---	---	---
		Black locust--------	---	---	---	---
		Black walnut--------	---	---	---	---
MaB-------------	4A	White oak-----------	70	52	180	0.67
Macove		Virginia pine-------	68	105	---	---
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
MaC-------------	4A	White oak-----------	70	52	180	0.67
Macove		Virginia pine-------	68	105	---	---
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
MaD-------------	4R	White oak-----------	70	52	180	0.67
Macove		Virginia pine-------	68	105	---	---
(north aspect)		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
MaD-------------	3R	White oak-----------	65	48	145	0.60
Macove		Virginia pine-------	63	96	---	---
(south aspect)		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Commonly grown trees	Site index	Cubic feet per acre	Board feet per acre	Cords per acre
		Potential productivity		Average annual growth in**--		
McC------------- Macove	4A	White oak-----------	70	52	180	0.67
		Virginia pine-------	68	105	---	---
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
McE------------- Macove (north aspect)	4R	White oak-----------	70	52	145	0.60
		Virginia pine-------	68	105	---	---
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
McE------------- Macove (south aspect)	3R	White oak-----------	65	48	145	0.60
		Virginia pine-------	63	96	---	---
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		Hickory-------------	---	---	---	---
MdC------------- Mandy	4A	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---
MdD------------- Mandy	4R	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---
MfC------------- Mandy	4A	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---
MfE------------- Mandy	4R	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---
MfF------------- Mandy	4R	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---
MfG------------- Mandy	4R	Black cherry--------	80	50	---	---
		American beech------	---	---	---	---
		Sugar maple---------	---	---	---	---
		Yellow birch--------	---	---	---	---
		Red spruce----------	65	152	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
MrB------------- Mertz	4A	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Pitch pine----------	75	---	---	---
MzC------------- Mertz	4A	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Pitch pine----------	75	---	---	---
MzE------------- Mertz	4R	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		Eastern white pine--	---	---	---	---
		Red maple-----------	---	---	---	---
		Pitch pine----------	75	---	---	---
Or-------------- Orville	4W	Northern red oak----	80	62	250	0.81
		White oak-----------	80	62	250	0.81
		Eastern white pine--	---	---	---	---
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---
Ph-------------- Philo	5A	Northern red oak----	86	68	292	0.89
		White oak-----------	85	67	285	0.88
		Eastern white pine--	---	---	---	---
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---
Po-------------- Potomac	4F	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	80	144	---	---
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---
Pt-------------- Potomac	4F	Northern red oak----	70	52	180	0.67
		White oak-----------	70	52	180	0.67
		Eastern white pine--	80	144	---	---
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---
Pu-------------- Purdy	5W	Pin oak-------------	85	66	278	0.87
		Yellow-poplar-------	90	90	---	---
		Sweetgum------------	85	93	---	---
Sc-------------- Sees	5A	White oak-----------	85	67	285	0.88
		Shingle oak---------	---	---	---	---
		Red maple-----------	---	---	---	---
		Quaking aspen-------	---	---	---	---
Se-------------- Sensabaugh	4A	White oak-----------	80	62	250	0.81
		Yellow poplar-------	100	107	580	1.23
		River birch---------	---	---	---	---
		American sycamore---	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
ShB------------- Shouns	4A	Northern red oak----	70	52	180	0.67
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Sugar maple---------	---	---	---	---
ShC------------- Shouns	4A	Northern red oak----	70	52	180	0.67
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Sugar maple---------	---	---	---	---
SsC------------- Shouns	4X	Northern red oak----	70	52	180	0.67
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Sugar maple---------	---	---	---	---
SsE------------- Shouns (north aspect)	4R	Northern red oak----	70	52	180	0.67
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Sugar maple---------	---	---	---	---
SsE------------- Shouns (south aspect)	3R	Northern red oak----	60	43	110	0.52
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		White oak-----------	60	43	110	0.52
		Sugar maple---------	---	---	---	---
SsF------------- Shouns (north aspect)	4R	Northern red oak----	70	52	180	0.67
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		Eastern hemlock-----	---	---	---	---
		White oak-----------	70	52	180	0.67
		Sugar maple---------	---	---	---	---
SsF------------- Shouns (south aspect)	3R	Northern red oak----	60	43	110	0.52
		American beech------	---	---	---	---
		Black cherry--------	---	---	---	---
		White oak-----------	60	43	110	0.52
		Sugar maple---------	---	---	---	---
SwE------------- Snowdog	4R	Black cherry--------	80	50	---	---
		Red spruce----------	65	152	---	---
		Red maple-----------	---	---	---	---
		Yellow birch--------	---	---	---	---
Tg-------------- Tioga	4A	Northern red oak----	75	57	215	0.74
		Yellow-poplar-------	85	81	380	0.93
		American sycamore---	---	---	---	---
		River birch---------	---	---	---	---
		Yellow buckeye------	---	---	---	---

See footnotes at end of table.

Table 9.--Woodland Productivity--Continued

Soil name and map symbol	Ordination symbol*	Potential productivity: Commonly grown trees	Site index	Average annual growth in**--: Cubic feet per acre	Board feet per acre	Cords per acre
TrC: Trussel	7W	Red spruce	45	95	---	---
		Red maple	---	---	---	---
		Black cherry	60	38	---	---
		Yellow birch	---	---	---	---
WeC: Weikert	2D	Northern red oak	50	34	60	0.38
		White oak	50	34	60	0.38
		Hickory	---	---	---	---
		Pitch pine	50	---	---	---
		Eastern white pine	---	---	---	---
		Chestnut oak	50	34	60	0.38
WeD: Weikert (north aspect)	3R	Northern red oak	60	43	110	0.52
		White oak	60	43	110	0.52
		Hickory	---	---	---	---
		Pitch pine	60	---	---	---
		Eastern white pine	---	---	---	---
		Chestnut oak	60	43	110	0.52
WeD: Weikert (south aspect)	2R	Northern red oak	50	34	60	0.38
		White oak	50	34	60	0.38
		Hickory	---	---	---	---
		Pitch pine	50	---	---	---
		Chestnut oak	50	34	60	0.38
WeF: Weikert (north aspect)	2R	Northern red oak	50	34	60	0.38
		White oak	50	34	60	0.38
		Hickory	---	---	---	---
		Pitch pine	50	---	---	---
		Eastern white pine	---	---	---	---
		Chestnut oak	50	34	60	0.38
WeF: Weikert (south aspect)	2R	Northern red oak	40	26	---	---
		White oak	40	26	---	---
		Hickory	---	---	---	---
		Pitch pine	40	---	---	---
		Chestnut oak	40	26	---	---

* The number in the ordination symbol is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands. The woodland ordination symbols have been developed from criteria in the “National Soil Survey Handbook” and the “National Forestry Manual” and from separate criteria developed for this soil survey by the Natural Resources Conservation Service and the Forest Service.

** Average annual growth is the total volume growth at rotation divided by rotation age. The actual annual growth varies with stand vigor and other factors. Yield data are based on site indices of natural stands at age 50. The International 1/4 Log Rule is used for board feet. Cords are standard rough cords. This information should be used for planning only.

*** See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AlB: Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
AlC: Allegheny	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
At: Atkins	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
BaB: Belmont	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
BaC: Belmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BaD: Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BbC: Belmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BbE, BbF: Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BeB: Berks	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Severe: small stones.
BeC: Berks	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: small stones, slope.	Slight	Severe: small stones.
BeD: Berks	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: slope.	Severe: slope, small stones.
BeE: Berks	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.	Severe: slope, small stones.
BfC: Berks	Severe: small stones.	Severe: small stones.	Severe: small stones, slope, large stones.	Moderate: large stones.	Severe: small stones.
BfE, BfF: Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope, large stones.	Severe: slope.	Severe: slope, small stones.
BgC*:					
Berks	Severe: small stones.	Severe: small stones.	Severe: small stones, slope, large stones.	Moderate: large stones.	Severe: small stones.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BgC*:					
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Severe: small stones.
BgE*, BgF*:					
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope, large stones.	Severe: slope.	Severe: slope, small stones.
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope, small stones.
BhG*:					
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope, large stones.	Severe: slope.	Severe: slope, small stones.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, large stones, depth to rock, small stones.	Severe: slope.	Severe: slope, small stones, depth to rock.
Calvin	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
BlC Blackthorn	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.
BlE, BlF Blackthorn	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
BoB Blairton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
BrF*:					
Briery	Variable	Variable	Variable	Variable	Variable.
Rock outcrop.					
CaC Calvin	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope, depth to rock.
CbC Calvin	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: large stones, slope, depth to rock.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CbE, CbF: Calvin	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
CdC*:					
Calvin	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: large stones, slope, depth to rock.
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Severe: small stones.
Berks	Severe: small stones.	Severe: small stones.	Severe: small stones, slope, large stones.	Moderate: large stones.	Severe: small stones.
CdE*, CdF*:					
Calvin	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope, small stones.
Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope, large stones.	Severe: slope.	Severe: slope, small stones.
CeB: Cateache	Moderate: small stones.	Moderate: small stones.	Moderate: slope, depth to rock, small stones.	Slight	Moderate: depth to rock, small stones.
CeC: Cateache	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope.	Slight	Moderate: slope, depth to rock, small stones.
CeD: Cateache	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CfC: Cateache	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope, large stones, small stones.	Slight	Moderate: slope, depth to rock, large stones.
CfE, CfF, CfG: Cateache	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
Ch: Chavies	Severe: flooding.	Slight	Moderate: small stones.	Slight	Slight.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CuB Culleoka	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
CuC Culleoka	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
CuD Culleoka	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CuE, CuF Culleoka	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DhC*:					
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Severe: small stones.
Hazleton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Slight	Moderate: slope, large stones.
DhE*, DhF*:					
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope, small stones.
Hazleton	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
DuB Duffield	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
DuC Duffield	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
ElF Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
FaC Faywood	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: large stones, slope, depth to rock.
FaE, FaF Faywood	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
GaC Gauley	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: slope, large stones, small stones.	Moderate: large stones.	Severe: large stones, small stones.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GaE: Gauley	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope, large stones.
Ho: Holly	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
LeC: Leatherbark	Severe: wetness.	Severe: wetness.	Severe: large stones, slope, wetness.	Severe: wetness.	Severe: wetness.
LlB: Lily	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
LlC: Lily	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
LlD: Lily	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lo: Lobdell	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: flooding, wetness.
LyB: Lodi	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
LyC: Lodi	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MaB: Macove	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, large stones.
MaC: Macove	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, slope.
MaD: Macove	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
McC: Macove	Severe: small stones.	Severe: small stones.	Severe: large stones, slope, small stones.	Severe: small stones.	Severe: small stones.
McE: Macove	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MdC-------------------Mandy	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope, depth to rock.
MdD-------------------Mandy	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
MfC-------------------Mandy	Moderate: large stones, small stones, slope.	Severe: large stones.	Severe: large stones, slope, small stones.	Slight----------	Moderate: large stones, slope, depth to rock.
MfE, MfF, MfG---------Mandy	Severe: slope.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Mh. Medihemists					
MrB-------------------Mertz	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight----------	Moderate: small stones.
MzC-------------------Mertz	Severe: small stones.	Severe: small stones.	Severe: large stones, slope, small stones.	Slight----------	Severe: small stones.
MzE-------------------Mertz	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Or--------------------Orrville	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
Ph--------------------Philo	Severe: flooding.	Moderate: wetness.	Moderate: small stones, flooding, wetness.	Moderate: wetness.	Moderate: wetness, flooding.
Po--------------------Potomac	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: droughty, flooding.
Pt--------------------Potomac	Severe: flooding, small stones.	Severe: small stones.	Severe: small stones, flooding.	Moderate: flooding.	Severe: small stones, droughty, flooding.
Pu--------------------Purdy	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Sc--------------------Sees	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.

See footnote at end of table.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Se: Sensabaugh	Severe: flooding.	Slight	Moderate: small stones, flooding.	Slight	Moderate: flooding.
ShB: Shouns	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
ShC: Shouns	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
SsC: Shouns	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Moderate: large stones.	Moderate: large stones, slope.
SsE, SsF: Shouns	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
SwE: Snowdog	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Tg: Tioga	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
TrC: Trussel	Severe: wetness.	Severe: wetness.	Severe: wetness, large stones, slope.	Severe: wetness.	Severe: wetness.
Uf*: Udifluvents.					
Fluvaquents.					
Us. Udorthents					
WeC: Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones.	Slight	Severe: droughty, depth to rock.
WeD: Weikert	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, depth to rock.
WeF: Weikert	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, depth to rock, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
AlB: Allegheny	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AlC: Allegheny	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
At: Atkins	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
BaB: Belmont	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaC: Belmont	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BaD: Belmont	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BbC: Belmont	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BbE: Belmont	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BbF: Belmont	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeB: Berks	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
BeC: Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BeD: Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BeE: Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BfC, BfE, BfF: Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BgC*:										
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
BgE*, BgF*:										
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
BhG*:										
Berks	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Weikert	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Calvin	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
BlC, BlE Blackthorn	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
BlF Blackthorn	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
BoB Blairton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BrF*:										
Briery	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
CaC Calvin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CbC, CbE Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CbF Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CdC*:										
Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CdE*:										
Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CdF*:										
Calvin	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
CdF*:										
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CeB Cateache	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CeC Cateache	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CeD Cateache	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CfC Cateache	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CfE, CfF Cateache	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CfG Cateache	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ch Chavies	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CuB Culleoka	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
CuC Culleoka	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CuD Culleoka	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CuE Culleoka	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CuF Culleoka	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DhC*:										
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DhE*, DhF*:										
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
DuB Duffield	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
DuC: Duffield	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ElF: Elliber	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
FaC, FaE, FaF: Faywood	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
GaC, GaE: Gauley	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Ho: Holly	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
LeC: Leatherbark	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
LlB: Lily	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LlC: Lily	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LlD: Lily	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Lo: Lobdell	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LyB: Lodi	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LyC: Lodi	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MaB: Macove	Good	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
MaC: Macove	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
MaD: Macove	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
McC: Macove	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
McE: Macove	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MdC: Mandy	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
MdD: Mandy	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
MfC, MfE, MfF: Mandy	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
MfG: Mandy	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Mh. Medihemists										
MrB: Mertz	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MzC: Mertz	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
MzE: Mertz	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Or: Orrville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ph: Philo	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Po, Pt: Potomac	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Pu: Purdy	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Sc: Sees	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
Se: Sensabaugh	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ShB: Shouns	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ShC: Shouns	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SsC, SsE: Shouns	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
SsF: Shouns	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
SwE: Snowdog	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Tg: Tioga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrC: Trussel	Very poor.	Poor	Fair	Poor	Poor	Good	Very poor.	Poor	Poor	Poor.
Uf*: Udifluvents.										
Fluvaquents.										

See footnote at end of table.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Us. Udorthents										
WeC, WeD, WeF------ Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AlB-- Allegheny	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
AlC-- Allegheny	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
At-- Atkins	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: wetness, flooding.
BaB-- Belmont	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
BaC-- Belmont	Moderate: slope, depth to rock.	Moderate: shrink-swell, slope.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
BaD-- Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
BbC-- Belmont	Moderate: slope, depth to rock.	Moderate: shrink-swell, slope.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
BbE, BbF-- Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
BeB-- Berks	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Slight	Severe: small stones.
BeC-- Berks	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Severe: small stones.
BeD, BeE-- Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
BfC-- Berks	Moderate: slope, depth to rock, large stones.	Moderate: large stones, slope.	Moderate: depth to rock, large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
BfE, BfF-- Berks	Severe: slope.	Severe: slope.	Severe	Severe: slope.	Severe: slope.	Severe: slope, small stones.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BgC*:						
Berks	Moderate: slope, depth to rock, large stones.	Moderate: large stones, slope.	Moderate: depth to rock, large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Severe: small stones.
BgE*, BgF*:						
Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
BhG*:						
Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Weikert	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones, depth to rock.
Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BlC Blackthorn	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Moderate: small stones, large stones, slope.
BlE, BlF Blackthorn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BoB Blairton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
BrF*:						
Briery	Variable	Variable	Variable	Variable	Variable	Variable.
Rock outcrop.						
CaC Calvin	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope, depth to rock.
CbC Calvin	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope, depth to rock.
CbE, CbF Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CdC*:						
Calvin	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope, depth to rock.
Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Severe: small stones.
Berks	Moderate: slope, depth to rock, large stones.	Moderate: large stones, slope.	Moderate: depth to rock, large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
CdE*, CdF*:						
Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
CeB Cateache	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: slope, shrink-swell.	Moderate: shrink-swell, frost action.	Moderate: depth to rock, small stones.
CeC Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope, slippage.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock, small stones.
CeD Cateache	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
CfC Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope, slippage.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock, large stones.
CfE, CfF, CfG Cateache	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
Ch Chavies	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
CuB Culleoka	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength.	Moderate: depth to rock.
CuC Culleoka	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope, depth to rock.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CuD, CuE, CuF----- Culleoka	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DhC*:						
Dekalb-----------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Severe: small stones.
Hazleton---------	Moderate: depth to rock, slope, large stones.	Moderate: slope, large stones.	Moderate: slope, large stones, depth to rock.	Severe: slope.	Moderate: slope, frost action, large stones.	Moderate: slope, large stones.
DhE*, DhF*:						
Dekalb-----------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
Hazleton---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DuB--------------- Duffield	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
DuC--------------- Duffield	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
ElF--------------- Elliber	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
FaC--------------- Faywood	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope, depth to rock.
FaE, FaF---------- Faywood	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
GaC--------------- Gauley	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Severe: large stones, small stones.
GaE--------------- Gauley	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
Ho---------------- Holly	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LeC: Leatherbark	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.
LlB: Lily	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.
LlC: Lily	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: slope, depth to rock.
LlD: Lily	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lo: Lobdell	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
LyB: Lodi	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
LyC: Lodi	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MaB: Macove	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones.	Moderate: small stones, large stones.
MaC: Macove	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Moderate: small stones, large stones, slope.
MaD: Macove	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.
McC: Macove	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Severe: small stones.
McE: Macove	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
MdC: Mandy	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope, depth to rock.
MdD: Mandy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MfC: Mandy	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope, depth to rock.
MfE, MfF, MfG: Mandy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mh. Medihemists						
MrB: Mertz	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Moderate: small stones.
MzC: Mertz	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Severe: small stones.
MzE: Mertz	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Or: Orrville	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, flooding.
Ph: Philo	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
Po: Potomac	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
Pt: Potomac	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: small stones, droughty, flooding.
Pu: Purdy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
Sc: Sees	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Se: Sensabaugh	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
ShB: Shouns	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ShC: Shouns	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.

See footnote at end of table.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SsC: Shouns	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
SsE, SsF: Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SwE: Snowdog	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tg: Tioga	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
TrC: Trussel	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness, frost action.	Severe: wetness.
Uf*:						
Udifluvents.						
Fluvaquents.						
Us.						
Udorthents						
WeC: Weikert	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: droughty, depth to rock.
WeD, WeF: Weikert	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, depth to rock, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AlB: Allegheny	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: seepage.	Slight	Fair: too clayey.
AlC: Allegheny	Moderate: slope, percs slowly.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.
At: Atkins	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Poor: wetness.
BaB: Belmont	Moderate: depth to rock, percs slowly.	Moderate: slope, depth to rock, seepage.	Severe: depth to rock.	Moderate: depth to rock.	Fair: too clayey, depth to rock, thin layer.
BaC: Belmont	Moderate: depth to rock, slope, percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: slope, too clayey, depth to rock, thin layer.
BaD: Belmont	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
BbC: Belmont	Moderate: depth to rock, slope, percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: slope, too clayey, depth to rock.
BbE, BbF: Belmont	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
BeB: Berks	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
BeC: Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
BeD, BeE: Berks	Severe: depth to rock, slope.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.
BfC: Berks	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BfE, BfF: Berks	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.
BgC*:					
Berks	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
BgE*, BgF*:					
Berks	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock, thin layer.
BhG*:					
Berks	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.
Weikert	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, depth to rock, seepage.
Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
BlC: Blackthorn	Moderate: percs slowly, slope, large stones.	Severe: seepage, slope.	Moderate: slope, large stones.	Severe: seepage.	Poor: small stones.
BlE, BlF: Blackthorn	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: small stones, slope.
BoB: Blairton	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, small stones, thin layer.
BrF*:					
Briery	Variable	Variable	Variable	Variable	Variable.
Rock outcrop.					

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CaC, CbC------------ Calvin	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones, thin layer.
CbE, CbF------------ Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
CdC*:					
Calvin-------------	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones, thin layer.
Dekalb-------------	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
Berks--------------	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
CdE*, CdF*:					
Calvin-------------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Dekalb-------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.
Berks--------------	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.
CeB----------------- Cateache	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.
CeC----------------- Cateache	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.
CeD----------------- Cateache	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Poor: slope, depth to rock, thin layer.
CfC----------------- Cateache	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CfE, CfF, CfG-------Cateache	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Poor: slope, depth to rock, thin layer.
Ch------------------Chavies	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
CuB-----------------Culleoka	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, thin layer.
CuC-----------------Culleoka	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, thin layer.
CuD, CuE, CuF-------Culleoka	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope, thin layer.
DhC*:					
Dekalb--------------	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.
Hazleton-----------	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.
DhE*, DhF*:					
Dekalb-------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.
Hazleton-----------	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.
DuB-----------------Duffield	Moderate: depth to rock.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Poor: hard to pack.
DuC-----------------Duffield	Moderate: depth to rock, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: hard to pack.
ElF-----------------Elliber	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
FaC-----------------Faywood	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FaE, FaF------------ Faywood	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
GaC----------------- Gauley	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
GaE----------------- Gauley	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage, slope.	Severe: slope, depth to rock, seepage.	Poor: slope, depth to rock, small stones.
Ho------------------ Holly	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
LeC----------------- Leatherbark	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Poor: depth to rock, wetness.
LlB----------------- Lily	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
LlC----------------- Lily	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
LlD----------------- Lily	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Lo------------------ Lobdell	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
LyB----------------- Lodi	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight-----------	Poor: too clayey, hard to pack.
LyC----------------- Lodi	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
MaB----------------- Macove	Severe: large stones.	Severe: seepage, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
MaC----------------- Macove	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MaD: Macove	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
McC: Macove	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: seepage, large stones.
McE: Macove	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
MdC: Mandy	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones, thin layer.
MdD: Mandy	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
MfC: Mandy	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones, thin layer.
MfE, MfF, MfG: Mandy	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Mh. Medihemists					
MrB: Mertz	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Poor: small stones.
MzC: Mertz	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Poor: small stones.
MzE: Mertz	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Or: Orrville	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ph: Philo	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Fair: wetness.

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Po, Pt: Potomac	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy, small stones.
Pu: Purdy	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
Sc: Sees	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Poor: too clayey, hard to pack, wetness.
Se: Sensabaugh	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: small stones.
ShB: Shouns	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
ShC: Shouns	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
SsC: Shouns	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
SsE, SsF: Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
SwE: Snowdog	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: seepage, wetness, slope.	Severe: slope, wetness.	Poor: small stones, slope.
Tg: Tioga	Severe: flooding, poor filter.	Severe: flooding, seepage.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Good.
TrC: Trussel	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Uf*:					
Udifluvents.					
Fluvaquents.					
Us. Udorthents					

See footnote at end of table.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WeC----------------- Weikert	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, seepage, small stones.
WeD, WeF------------ Weikert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, seepage, small stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AlB: Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
AlC: Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
At: Atkins	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
BaB: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
BaC: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
BaD: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BbC: Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
BbE, BbF: Belmont	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BeB, BeC: Berks	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
BeD: Berks	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
BeE: Berks	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
BfC: Berks	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones. slope.
BfE, BfF: Berks	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BgC*:				
Berks	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
BgE*, BgF*:				
Berks	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
BhG*:				
Berks	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Weikert	Poor: slope, depth to rock.	Improbable: small stones, thin layer.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
Calvin	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BlC Blackthorn	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BlE, BlF Blackthorn	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BoB Blairton	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
BrF*:				
Briery	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Rock outcrop.				
CaC, CbC Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CbE, CbF Calvin	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CdC*:				
Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Berks	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
CdE*, CdF*:				
Calvin	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Berks	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
CeB, CeC Cateache	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
CeD Cateache	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
CfC Cateache	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
CfE, CfF, CfG Cateache	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Ch Chavies	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
CuB Culleoka	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Fair: area reclaim.
CuC Culleoka	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Fair: area reclaim, slope.
CuD Culleoka	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope.
CuE, CuF Culleoka	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DhC*:				
Dekalb	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Hazleton	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
DhE*, DhF*:				
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Hazleton	Severe: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
DuB Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
DuC Duffield	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
ElF Elliber	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
FaC Faywood	Poor: depth to rock, low strength.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: thin layer.
FaE, FaF Faywood	Poor: depth to rock, low strength, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: thin layer, slope.
GaC Gauley	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
GaE Gauley	Poor: slope, depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones.
Ho Holly	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LeC Leatherbark	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
LlB, LlC Lily	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Fair: area reclaim, small stones.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LlD: Lily	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope.
Lo: Lobdell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
LyB, LyC: Lodi	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MaB, MaC: Macove	Fair: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones.
MaD: Macove	Fair: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
McC: Macove	Fair: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: area reclaim, small stones.
McE: Macove	Poor: slope.	Improbable: large stones.	Improbable: large stones.	Poor: area reclaim, small stones, slope.
MdC: Mandy	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
MdD: Mandy	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
MfC: Mandy	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
MfE, MfF, MfG: Mandy	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Mh. Medihemists				
MrB: Mertz	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MzC: Mertz	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MzE: Mertz	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Or: Orrville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Ph: Philo	Fair: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Po, Pt: Potomac	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Pu: Purdy	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
Sc: Sees	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Se: Sensabaugh	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
ShB: Shouns	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
ShC: Shouns	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
SsC: Shouns	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
SsE, SsF: Shouns	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
SwE: Snowdog	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Tg: Tioga	Good	Probable	Probable	Poor: small stones, area reclaim.
TrC: Trussel	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, wetness.
Uf*: Udifluvents.				
Fluvaquents.				
Us. Udorthents				

See footnote at end of table.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
WeC------------------- Weikert	Poor: depth to rock.	Improbable: small stones, thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones.
WeD------------------- Weikert	Poor: depth to rock.	Improbable: small stones, thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
WeF------------------- Weikert	Poor: depth to rock, slope.	Improbable: small stones, thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
AlB: Allegheny	Moderate: seepage, slope.	Severe: piping.	Deep to water	Favorable	Favorable.
AlC: Allegheny	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
At: Atkins	Severe: seepage.	Severe: piping, wetness.	Flooding, frost action, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
BaB: Belmont	Moderate: seepage, depth to rock, slope.	Moderate: thin layer.	Deep to water	Favorable	Favorable.
BaC, BaD: Belmont	Severe: slope.	Moderate: thin layer.	Deep to water	Slope	Slope.
BbC, BbE, BbF: Belmont	Severe: slope.	Moderate: thin layer.	Deep to water	Slope	Slope.
BeB: Berks	Severe: seepage.	Severe: seepage.	Deep to water	Depth to rock, large stones.	Droughty, depth to rock, large stones.
BeC, BeD, BeE: Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
BfC, BfE, BfF: Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
BgC*, BgE*, BgF*:					
Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
BhG*:					
Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
Weikert	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.

See footnote at end of table.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
BhG*:					
Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
BlC, BlE, BlF Blackthorn	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
BoB Blairton	Moderate: seepage, depth to rock, slope.	Severe: piping.	Depth to rock, frost action, slope.	Depth to rock, wetness.	Wetness.
BrF*:					
Briery	Severe: seepage, slope.	Moderate: piping, large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
Rock outcrop.					
CaC, CbC, CbE, CbF Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
CdC*, CdE*, CdF*:					
Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
CeB Cateache	Moderate: seepage, depth to rock, slope.	Severe: piping.	Deep to water	Depth to rock	Depth to rock.
CeC, CeD, CfC, CfE, CfF, CfG Cateache	Severe: slope, slippage.	Severe: piping.	Deep to water	Slope, depth to rock, slippage.	Slope, depth to rock.
Ch Chavies	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
CuB Culleoka	Severe: seepage.	Severe: piping.	Deep to water	Large stones, depth to rock.	Large stones, depth to rock.
CuC, CuD, CuE, CuF Culleoka	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.

See footnote at end of table.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
DhC*, DhE*, DhF*:					
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Hazleton	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, slope.	Large stones, slope, droughty.
DuB Duffield	Moderate: seepage, depth to rock, slope.	Severe: piping, hard to pack.	Deep to water	Favorable	Favorable.
DuC Duffield	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
ElF Elliber	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
FaC Faywood	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
FaE, FaF Faywood	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
GaC, GaE Gauley	Severe: slope, seepage.	Severe: piping, large stones.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Ho Holly	Severe: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness	Wetness.
LeC Leatherbark	Severe: slope.	Severe: piping, wetness.	Depth to rock, frost action, slope.	Depth to rock, slope, large stones.	Large stones, wetness, slope.
LlB Lily	Severe: seepage.	Severe: piping.	Deep to water	Depth to rock	Depth to rock.
LlC Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
LlD Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
Lo Lobdell	Severe: seepage.	Severe: piping, seepage.	Flooding, frost action.	Erodes easily, wetness.	Erodes easily.
LyB Lodi	Moderate: seepage, slope.	Moderate: hard to pack.	Deep to water	Favorable	Favorable.

See footnote at end of table.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
LyC: Lodi	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope	Slope.
MaB: Macove	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones	Large stones, droughty.
MaC, MaD: Macove	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
McC, McE: Macove	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
MdC, MdD: Mandy	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
MfC, MfE, MfF, MfG: Mandy	Severe: slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Mh. Medihemists					
MrB: Mertz	Moderate: slope.	Severe: piping.	Deep to water	Favorable	Favorable.
MzC, MzE: Mertz	Severe: slope.	Severe: piping.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
Or: Orrville	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
Ph: Philo	Severe: seepage.	Severe: piping, wetness.	Flooding	Wetness	Favorable.
Po, Pt: Potomac	Severe: seepage.	Severe: seepage.	Deep to water	Large stones, too sandy.	Large stones, droughty.
Pu: Purdy	Slight	Severe: piping, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.
Sc: Sees	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Wetness, percs slowly.
Se: Sensabaugh	Severe: seepage.	Moderate: large stones.	Deep to water	Large stones	Large stones.
ShB: Shouns	Moderate: seepage, slope.	Severe: piping.	Deep to water	Favorable	Favorable.

See footnote at end of table.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
ShC, SsC, SsE, SsF: Shouns	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope.
SwE: Snowdog	Severe: seepage, slope.	Severe: seepage, piping.	Percs slowly, large stones, slope.	Slope, large stones, wetness, rooting depth.	Large stones, slope, droughty, rooting depth.
Tg: Tioga	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Droughty.
TrC: Trussel	Severe: slope.	Severe: wetness, piping.	Frost action, slope, percs slowly.	Slope, wetness, rooting depth.	Slope, wetness, rooting depth.
Uf*: Udifluvents.					
Fluvaquents.					
Us. Udorthents					
WeC, WeD, WeF: Weikert	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
AlB, AlC---------Allegheny	0-8	Loam-------------	ML, CL	A-4	0	90-100	80-100	65-100	55-95	<35	NP-10
	8-40	Gravelly silt loam, gravelly loam, very gravelly fine sandy loam, loam.	ML, CL, SM, SC	A-4, A-6, A-2	0	55-100	50-100	35-100	20-90	<35	NP-15
	40-65	Clay loam, sandy loam, extremely gravelly fine sandy loam.	SM, GC, ML, CL	A-4, A-6, A-2, A-1	0-5	15-60	10-55	5-55	5-45	<35	NP-15
At---------------Atkins	0-4	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	90-100	85-100	75-100	60-95	20-40	3-20
	4-25	Silty clay loam, silt loam, sandy loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	65-100	45-85	20-40	3-20
	25-65	Stratified silty clay loam to very gravelly sandy loam.	SM, CL, GM, ML	A-2, A-4, A-6	0-15	35-100	30-100	20-100	10-95	20-40	1-15
BaB, BaC, BaD----Belmont	0-6	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0-5	80-100	75-100	65-100	50-90	20-40	5-15
	6-23	Channery silty clay loam, channery silt loam, clay loam.	ML, CL-ML, CL	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-45	5-20
	23-35	Silty clay loam, clay loam, channery silty clay.	CL	A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-50	11-25
	35-51	Channery clay loam, very channery silty clay, channery sandy clay loam.	CL, GC	A-4, A-6, A-7	0-20	40-75	35-70	25-70	15-65	25-45	7-25
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
BbC, BbE, BbF----Belmont	0-6	Very rocky silt loam.	CL, ML, CL-ML	A-4, A-6	0-5	80-100	75-100	65-100	50-90	20-40	5-15
	6-23	Channery silty clay loam, channery silt loam, clay loam.	CL-ML, CL	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-45	5-20
	23-35	Silty clay loam, clay loam, channery silty clay.	CL	A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-50	11-25
	35-51	Channery clay loam, very channery silty clay, channery sandy clay loam.	CL, GC, SC	A-4, A-6, A-7, A-2	0-20	40-75	35-70	25-70	15-65	25-45	7-25
	51	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BeB, BeC, BeD, BeE------------- Berks	0-4	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-20	50-80	45-70	40-60	30-55	25-36	5-10
	4-22	Channery loam, very channery silt loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	22-31	Channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
BfC, BfE, BfF---- Berks	0-4	Very stony silt loam.	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	4-22	Channery loam, very channery silt loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	22-31	Channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
BgC*, BgE*, BgF*:											
Berks-----------	0-4	Very stony silt loam.	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	4-22	Channery loam, very channery silt loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	22-31	Channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb----------	0-4	Very stony loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	4-26	Channery sandy loam, channery loam, very channery loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	26-36	Very channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
BhG*:											
Berks	0-4	Very stony silt loam.	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	4-22	Channery loam, very channery silt loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	22-31	Channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
Weikert	0-6	Very stony silt loam.	GM, ML, SM	A-1, A-2, A-4	3-15	35-70	35-70	25-65	20-55	30-40	4-10
	6-15	Very channery silt loam, extremely channery silt loam, channery loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
Calvin	0-4	Very stony silt loam.	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	4-27	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27-39	Channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, GM-GC, SC-SM	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
BlC, BlE, BlF Blackthorn	0-10	Extremely stony loam.	ML, SM, CL-ML, SC-SM	A-2, A-4, A-1	5-15	65-90	60-85	35-70	15-55	15-27	NP-7
	10-51	Channery sandy loam, very channery sandy loam, very channery loam.	GM, SM, SC, SC-SM	A-2, A-4, A-1	5-30	40-90	25-90	20-60	10-45	18-30	1-9
	51-65	Clay, clay loam, silty clay.	CL, CH	A-6, A-7	0-10	85-100	70-100	65-95	55-90	30-65	15-40

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
BoB: Blairton	0-2	Silt loam	ML, CL-ML	A-4	0	80-100	75-100	65-90	50-80	20-35	2-10
	2-24	Silt loam, very channery silty clay loam, silty clay loam.	ML, CL, GM	A-4, A-6, A-7, A-2	0-5	50-90	35-90	30-85	25-70	25-42	2-20
	24-34	Very channery loam, channery loam, extremely channery silt loam.	GM, SM, ML, CL	A-4, A-2, A-6, A-1	0-10	15-65	15-65	15-65	10-60	25-40	2-12
	34	Weathered bedrock	---	---	---	---	---	---	---	---	---
BrF*: Briery	0-2	Very stony silt loam.	GC	A-2, A-4	3-15	45-60	40-55	30-50	20-40	25-35	7-11
	2-65	Very channery silt loam, extremely channery silty clay loam.	GC	A-2, A-4	5-30	30-55	25-50	25-45	20-45	25-35	7-11
Rock outcrop.											
CaC: Calvin	0-4	Channery silt loam.	ML, CL	A-4	0-15	70-95	70-90	65-90	55-75	---	---
	4-27	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27-39	Channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-13
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
CbC, CbE, CbF: Calvin	0-4	Very stony silt loam.	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	4-27	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27-39	Channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, GM-GC, SC-SM	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
CdC*, CdE*, CdF*:											
Calvin----------	0-4	Very stony silt loam.	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	4-27	Channery silt loam, channery loam, very channery silt loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	27-39	Channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, GM-GC, SC-SM	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	39	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb----------	0-4	Very stony loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	4-26	Channery sandy loam, channery loam, very channery loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	26-36	Very channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Berks-----------	0-4	Very stony silt loam.	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	4-22	Channery loam, very channery silt loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	22-31	Channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	31	Weathered bedrock	---	---	---	---	---	---	---	---	---
CeB, CeC, CeD---- Cateache	0-6	Channery silt loam.	CL, CL-ML, GM-GC, GC	A-4, A-6	0-10	70-85	65-80	60-75	45-70	20-40	4-15
	6-28	Channery silty clay loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	28-32	Very channery silty clay loam, extremely channery silty clay loam.	GM-GC, GC, GP, GP-GC	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
CfC, CfE, CfF, CfG------------- Cateache	0-6	Very stony silt loam.	CL, CL-ML, GM-GC, GC	A-4, A-6	15-30	70-85	65-80	60-75	45-70	20-40	4-15
	6-28	Channery silty clay loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	28-32	Very channery silty clay loam, extremely channery silty clay loam.	GM-GC, GC, GP-GC	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ch--------------- Chavies	0-8	Fine sandy loam	SM, ML, CL-ML, SC-SM	A-4	0	85-100	75-100	40-90	40-75	<25	NP-5
	8-41	Fine sandy loam, silt loam, loam.	SM, ML	A-4	0	85-100	75-100	65-100	45-85	<35	NP-8
	41-65	Fine sandy loam, gravelly fine sandy loam, loam.	SM, ML, CL-ML, SC-SM	A-4, A-2, A-1-b	0-5	70-100	60-95	40-85	20-75	<25	NP-5
CuB, CuC, CuD, CuE, CuF-------- Culleoka	0-1	Silt loam--------	ML, CL, CL-ML	A-4	0-5	90-100	85-100	70-100	55-95	<35	NP-10
	1-21	Channery silt loam, very channery silt loam, silty clay loam.	ML, CL, CL-ML	A-6, A-4	5-25	80-95	75-95	65-95	55-90	20-40	2-20
	21-33	Very flaggy silty clay loam, extremely channery silt loam, flaggy loam.	ML, CL, GC, GM	A-6, A-4, A-2	10-60	50-95	40-90	35-90	30-85	20-40	2-20
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DhC*, DhE*, DhF*: Dekalb----------	0-4	Very stony loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	4-26	Channery sandy loam, channery loam, very channery loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	26-36	Very channery sandy loam, flaggy sandy loam, very flaggy loamy sand.	SM, GM, SC, GC	A-2, A-4, A-1	10-50	45-85	25-75	20-65	15-40	15-32	NP-9
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
DhC*, DhE*, DhF*:											
Hazleton--------	0-2	Very stony loam	ML, GM, SM	A-4, A-2	5-15	60-85	50-80	50-70	35-55	---	---
	2-30	Channery fine sandy loam, channery loam, very channery sandy loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-50	60-95	45-90	35-70	20-55	<30	NP-8
	30-50	Channery loam, extremely channery sandy loam, very channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	5-60	50-80	35-75	25-65	15-50	<30	NP-8
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
DuB, DuC--------- Duffield	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	85-100	85-100	80-100	70-95	20-50	5-20
	8-37	Silty clay loam, silty clay, channery loam.	ML, CL, MH, CH	A-4, A-6, A-7	0-10	65-100	60-100	55-100	55-95	30-55	8-22
	37-46	Channery silty clay, loam, clay.	MH, GM, SM, ML	A-7, A-5	0-20	65-100	50-100	45-90	40-90	40-60	9-29
	46	Weathered bedrock	---	---	---	---	---	---	---	---	---
ElF-------------- Elliber	0-2	Extremely channery silt loam.	GM, GP	A-2, A-1, A-4	5-15	30-60	20-55	15-45	10-40	---	---
	2-65	Extremely channery silt loam, very channery clay loam, very channery loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	20-40	40-65	30-60	25-50	5-40	20-35	NP-7
FaC, FaE, FaF---- Faywood	0-8	Silt loam--------	ML, CL-ML	A-4	0-15	100	95-100	90-100	85-100	25-35	4-10
	8-28	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-15	90-100	90-100	85-100	75-100	42-70	20-45
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GaC, GaE--------- Gauley	0-9	Extremely stony sandy loam.	GM, SM, ML, CL-ML	A-1, A-2, A-4	30-50	40-80	40-75	35-70	20-55	15-25	NP-7
	9-23	Channery loam, very channery loam, very channery sandy loam.	GM, SM, ML, CL-ML	A-1, A-2, A-4	10-40	45-80	40-80	40-75	20-55	15-25	NP-7
	23-35	Channery loam, very channery sandy loam, extremely channery loam.	GM, SM, GM-GC, SC-SM	A-1, A-2, A-4	10-50	45-75	30-75	25-70	20-50	15-25	NP-7
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Ho--------------- Holly	0-4	Silt loam--------	ML	A-4	0	90-100	85-100	80-100	70-90	25-35	3-10
	4-42	Silt loam, loam, sandy loam.	ML, SM	A-4, A-6	0	85-100	75-100	70-95	45-85	20-40	NP-14
	42-65	Silt loam, loam, sandy loam.	ML, SM	A-4, A-2	0	85-100	75-100	50-95	25-80	20-40	NP-10
LeC-------------- Leatherbark	0-5	Very stony silt loam.	ML, CL-ML	A-4	0-10	80-95	75-90	60-90	45-80	20-30	5-10
	5-35	Loam, channery silt loam, silty clay loam.	ML, CL, CL-ML, SC	A-4, A-6	5-15	75-100	70-90	60-85	40-80	25-40	5-15
	35-38	Loam, very channery silt loam, channery loam.	CL, CL-ML, ML, SC	A-4, A-6	10-25	55-80	50-75	40-75	30-70	25-35	5-15
	38	Weathered bedrock	---	---	---	---	---	---	---	---	---
LlB, LlC, LlD---- Lily	0-2	Loam-------------	ML, CL-ML	A-4	0-5	90-100	85-100	70-95	55-80	<35	NP-10
	2-32	Clay loam, channery sandy loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	32	Weathered bedrock bedrock.	---	---	---	---	---	---	---	---	---
Lo--------------- Lobdell	0-10	Silt loam--------	ML, CL-ML, CL	A-4	0	95-100	90-100	80-100	65-90	20-30	NP-8
	10-28	Loam, silt loam	ML	A-4	0	90-100	80-100	70-95	55-85	20-35	NP-10
	28-65	Stratified sandy loam to very gravelly silt loam.	ML, SM, CL-ML, CL, GM	A-4, A-2	0	35-100	30-100	20-100	10-90	15-35	NP-10
LyB, LyC--------- Lodi	0-6	Silt loam--------	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-100	75-95	50-90	25-85	<30	NP-15
	6-21	Clay, silt loam, clay loam.	CL	A-6	0-10	85-100	75-95	65-90	55-85	25-40	10-20
	21-47	Clay, silty clay loam, sandy clay loam.	CH, CL, SC	A-7	0-5	85-100	75-95	60-95	40-80	40-60	20-35
	47-65	Silty clay, clay loam, loam.	ML, SM, CL, SC	A-4, A-6	0-5	85-100	75-95	60-85	40-80	<40	NP-25
MaB, MaC, MaD---- Macove	0-4	Channery silt loam.	SM, GM	A-4, A-1-b, A-2-4	5-10	30-60	25-60	20-50	15-40	20-30	NP-7
	4-14	Channery silt loam, very channery silt loam, very channery loam.	GM, SM, GP-GM	A-4, A-1-a, A-1-b	5-45	40-65	30-60	25-50	5-40	20-30	NP-7
	14-65	Extremely channery silty clay loam, very channery loam, very channery silty clay loam.	GM, SM, GP-GM	A-2, A-1-b, A-1-a	25-75	35-60	25-50	20-45	5-25	20-30	NP-7

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
McC, McE--------- Macove	0-4	Very stony silt loam.	SM, GM	A-4, A-1-b, A-2-4	5-10	30-60	25-60	20-50	15-40	20-30	NP-7
	4-14	Channery silt loam, very channery silt loam, very channery loam.	SM, GM	A-4, A-1-b, A-2-4	5-10	30-60	25-60	20-50	15-40	20-30	NP-7
	14-65	Very channery silty clay loam, extremely channery silty clay loam, very channery loam.	GM, SM, GP-GM	A-2, A-1-b, A-1-a	25-75	35-60	25-50	20-45	5-25	20-30	NP-7
MdC, MdD--------- Mandy	0-5	Channery silt loam.	CL-ML, CL	A-4	0-15	65-80	60-75	55-70	50-65	20-32	4-10
	5-28	Channery silt loam, very channery silt loam, extremely channery loam.	GM, GC, SC-SM	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	20-32	4-10
	28-36	Extremely channery silt loam, extremely channery loam.	GM, GC, SC-SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	20-32	4-10
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
MfC, MfE, MfF, MfG------------- Mandy	0-5	Very stony silt loam.	CL-ML, CL	A-4	15-30	65-80	60-75	55-70	50-65	20-32	4-10
	5-28	Channery silt loam, very channery silt loam, extremely channery loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	20-32	4-10
	28-36	Extremely channery silt loam, extremely channery loam.	GM, GC, SM, SC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	20-32	4-10
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
Mh. Medihemists											
MrB-------------- Mertz	0-3	Channery silt loam.	ML, GM	A-4	5-10	70-95	55-85	45-85	40-75	---	NP
	3-54	Very channery clay loam, extremely channery silty clay loam, channery silt loam, channery silty clay loam.	ML, CL, GM, GC	A-6, A-7, A-4	5-20	55-95	45-85	45-85	40-75	30-45	7-20
	54-65	Channery clay loam, very channery loam, extremely channery silty clay loam.	CL, GC, SC	A-6, A-7, A-2	5-50	55-80	30-75	30-70	25-55	30-45	10-20

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
MzC, MzE--------- Mertz	0-3	Very stony silt loam.	ML, GM	A-4	5-15	60-95	45-85	45-85	40-75	25-40	4-12
	3-54	Channery silt loam, extremely channery silty clay loam, very channery clay loam.	ML, CL, GM, GC	A-4, A-6, A-7	5-20	55-95	45-85	45-85	40-75	30-45	7-20
	54-65	Channery silt loam, extremely channery silty clay loam, extremely channery silt loam.	ML, CL, GC, GM	A-6, A-7	5-20	55-80	30-75	30-70	25-55	30-45	10-20
Or--------------- Orrville	0-9	Silt loam--------	ML, CL-ML, CL	A-4	0	100	90-100	85-100	60-80	20-35	3-10
	9-40	Silt loam, loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0-2	95-100	75-100	70-95	50-90	20-40	2-16
	40-65	Stratified very gravelly loamy sand to silt loam.	ML, CL, SM, SC	A-4, A-2, A-1	0-2	50-100	45-100	20-100	10-90	15-35	NP-10
Ph--------------- Philo	0-9	Silt loam--------	ML, SM, CL-ML	A-4	0-5	95-100	80-100	85-90	60-80	20-35	1-10
	9-33	Silt loam, loam, gravelly loam.	ML, GM, CL-ML	A-4	0-5	80-100	75-100	70-90	45-80	20-35	1-10
	33-40	Very gravelly loam, gravelly silt loam, loam.	GM, SM, GW-GM	A-2, A-4	0-5	55-100	50-100	40-85	35-80	20-35	1-10
	40-65	Stratified extremely gravelly sand to extremely gravelly silt loam.	GM, SM, GC, SC	A-2, A-4	0-10	25-100	20-100	15-95	10-90	15-30	1-10
Po--------------- Potomac	0-10	Loam-------------	SM, ML, SC-SM, CL-ML	A-2, A-4	0-10	80-100	80-100	50-85	30-60	<20	NP-5
	10-65	Extremely gravelly sandy loam, extremely gravelly loamy sand, extremely gravelly sand.	SM, GM, SW-SM, GW-GM	A-1, A-2	10-25	25-35	20-30	10-25	5-15	<15	NP-3
Pt---------------- Potomac	0-10	Very gravelly loam.	SM, GM, SC-SM, GM-GC	A-1, A-2, A-4	0-25	45-55	40-50	20-50	5-40	<20	NP-5
	10-65	Extremely gravelly sandy loam, extremely gravelly loamy sand, extremely gravelly sand.	SM, GM, SW-SM, GW-GM	A-1, A-2	10-25	25-35	20-30	10-25	5-15	<15	NP-3

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Pu--------------- Purdy	0-5	Silt loam--------	ML, CL	A-4, A-6, A-7	0	95-100	90-100	90-100	90-100	25-50	4-20
	5-38	Silty clay, clay, silty clay loam.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	75-85	30-65	11-30
	38-65	Silty clay, very gravelly silty clay loam, clay.	CL, CH, MH, GC, GM	A-6, A-7, A-2	0	40-100	35-100	30-100	25-95	30-65	11-30
Sc--------------- Sees	0-8	Silt loam--------	ML, CL	A-6, A-7	0-15	90-100	90-100	80-100	70-90	30-45	12-25
	8-58	Silty clay, clay, silty clay loam.	CH, MH, CL	A-7, A-6	0-15	90-100	90-100	85-100	80-95	35-70	20-40
	58-65	Silty clay, clay, flaggy silty clay.	CH, MH, CL	A-7	0-30	80-100	80-100	75-100	70-95	45-75	25-45
Se--------------- Sensabaugh	0-6	Silt loam--------	CL-ML, CL, ML	A-4	0-5	90-100	75-95	65-85	55-75	16-29	3-9
	6-21	Gravelly loam, gravelly clay loam, gravelly silty clay loam.	CL-ML, CL, SC-SM, GC	A-4, A-6	2-18	70-95	55-90	45-75	35-65	20-35	5-14
	21-40	Very gravelly loam, gravelly sandy clay loam, gravelly silty clay loam.	SC-SM, SC, GM-GC, GC	A-4, A-6	5-25	70-90	55-75	45-65	35-55	22-36	6-15
	40-65	Very gravelly loam, gravelly clay loam, extremely gravelly loam.	SC-SM, SC, GM-GC, GC	A-4, A-6, A-2	5-30	55-90	25-75	25-65	20-55	20-36	6-15
ShB, ShC--------- Shouns	0-3	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	80-100	75-100	65-95	55-90	15-30	3-12
	3-6	Silt loam, loam	ML, CL, CL-ML	A-4, A-6	0	80-100	75-100	70-95	60-90	15-35	5-15
	6-40	Channery silty clay loam, very channery silty clay loam.	CL, ML, GM, GC	A-4, A-6, A-2	0	45-100	40-100	35-100	35-95	25-40	8-17
	40-65	Silty clay loam, clay loam, very channery clay loam.	CL, ML	A-6, A-7	10-25	75-100	65-90	60-85	50-75	30-45	10-20
SsC, SsE, SsF---- Shouns	0-3	Extremely stony silt loam.	ML, CL, CL-ML	A-4, A-6	5-15	80-100	75-100	65-95	55-90	15-30	3-12
	3-40	Channery silty clay loam, silt loam, very channery silty clay loam.	CL, CL-ML, GM, GC	A-4, A-6, A-2	0-5	45-100	40-100	35-100	35-95	25-40	8-17
	40-65	Silty clay loam, clay loam, very channery clay loam.	CL, ML	A-6, A-7	10-25	75-100	65-90	60-85	50-75	30-45	10-20

See footnote at end of table.

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
SwE-------------- Snowdog	0-2	Extremely stony silt loam.	CL, CL-ML, SC, SC-SM	A-2, A-4	0-25	60-95	55-90	45-90	35-80	20-30	5-10
	2-16	Silt loam, channery silt loam, very channery loam.	ML, CL, SM, SC	A-2, A-4, A-6	0-15	60-95	55-90	45-90	35-80	25-35	5-15
	16-40	Channery sandy loam, very channery sandy loam, very channery loam.	ML, CL, SM, SC	A-2, A-4, A-6	10-30	45-80	40-75	25-75	10-70	25-35	5-15
	40-65	Channery silt loam, very channery loam, very channery sandy loam.	ML, CL, SM, SC	A-2, A-4, A-6	10-30	45-80	40-75	25-75	10-70	20-40	5-20
Tg--------------- Tioga	0-10	Fine sandy loam	ML, SM	A-4	0	100	95-100	65-95	40-85	<15	NP-4
	10-38	Silt loam, fine sandy loam, gravelly fine sandy loam.	SM, GM, ML	A-1, A-2, A-4	0	55-100	50-100	35-90	20-80	<15	NP-2
	38-65	Silt loam, fine sandy loam, very gravelly loamy sand.	GW-GM, GM, SM, ML	A-1, A-2, A-4, A-3	0-10	35-100	30-100	15-90	5-80	<15	NP-2
TrC-------------- Trussel	0-6	Very stony silt loam.	CL-ML, CL, SC	A-4	15-30	75-100	70-100	60-95	45-90	20-30	5-10
	6-18	Channery silt loam, silt loam, silty clay loam.	CL, ML, SC	A-4, A-6	0-10	75-100	70-100	60-100	45-95	25-40	7-14
	18-35	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
	35-65	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
Uf*: Udifluvents.											
Fluvaquents.											
Us. Udorthents											
WeC, WeD, WeF---- Weikert	0-6	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	6-15	Channery loam, very channery silt loam, extremely channery silt loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more 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 K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AlB, AlC: Allegheny	0-8	15-27	1.20-1.40	0.6-2.0	0.12-0.22	3.6-5.5	Low	0.32	4	1-4
	8-40	18-35	1.20-1.50	0.6-2.0	0.13-0.18	3.6-5.5	Low	0.28		
	40-65	10-35	1.20-1.40	0.6-6.0	0.03-0.08	3.6-5.5	Low	0.28		
At: Atkins	0-4	18-30	1.20-1.40	0.6-2.0	0.14-0.22	4.5-5.5	Low	0.32	4	2-4
	4-25	18-35	1.20-1.50	0.06-2.0	0.14-0.18	4.5-5.5	Low	0.32		
	25-65	10-35	1.20-1.50	0.2-6.0	0.08-0.18	4.5-5.5	Low	0.28		
BaB, BaC, BaD, BbC, BbE, BbF: Belmont	0-6	18-27	1.20-1.40	0.6-6.0	0.16-0.20	5.1-6.5	Low	0.32	3	2-4
	6-23	23-35	1.30-1.50	0.6-2.0	0.14-0.18	5.1-6.5	Moderate	0.32		
	23-35	27-40	1.30-1.50	0.6-2.0	0.14-0.18	5.6-7.3	Moderate	0.32		
	35-51	20-40	1.30-1.50	0.6-2.0	0.12-0.16	5.6-7.8	Moderate	0.28		
	51	---	---	---	---	---	---	---		
BeB, BeC, BeD, BeE: Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.17	3	.5-3
	4-22	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	22-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	31	---	---	---	---	---	---	---		
BfC, BfE, BfF: Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.17	3	1-4
	4-22	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	22-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	31	---	---	---	---	---	---	---		
BgC*, BgE*, BgF*:										
Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.17	3	1-4
	4-22	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	22-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	31	---	---	---	---	---	---	---		
Dekalb	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-4
	4-26	7-18	1.20-1.50	6.0-20	0.06-0.12	3.6-5.5	Low	0.17		
	26-36	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low	0.17		
	36	---	---	---	---	---	---	---		
BhG*:										
Berks	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low	0.17	3	1-4
	4-22	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	22-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-5.5	Low	0.17		
	31	---	---	---	---	---	---	---		
Weikert	0-6	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low	0.20	2	1-3
	6-15	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-5.5	Low	0.28		
	15	---	---	---	---	---	---	---		
Calvin	0-4	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-5.5	Low	0.15	3-2	1-4
	4-27	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low	0.20		
	27-39	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low	0.20		
	39	---	---	---	---	---	---	---		
BlC, BlE, BlF: Blackthorn	0-10	2-10	1.20-1.40	0.6-6.0	0.10-0.15	4.5-6.0	Low	0.20	4	2-5
	10-51	7-18	1.20-1.50	0.6-6.0	0.08-0.12	4.5-6.0	Low	0.20		
	51-65	27-60	1.30-1.60	0.2-2.0	0.14-0.18	4.5-5.5	Moderate	0.28		

See footnote at end of table.

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
BoB--------------	0-2	10-27	1.40-1.60	0.6-2.0	0.14-0.18	3.6-5.0	Low----------	0.43	3-2	1-4
Blairton	2-24	18-35	1.50-1.70	0.2-0.6	0.08-0.14	3.6-5.0	Low----------	0.32		
	24-34	20-40	1.40-1.60	0.2-2.0	0.04-0.10	3.6-5.0	Low----------	0.32		
	34	---	---	---	---	---	-------------	----		
BrF*:										
Briery----------	0-2	18-27	1.35-1.65	0.6-6.0	0.07-0.16	5.1-7.8	Low----------	0.32	5	<.5
	2-65	18-32	1.35-1.65	0.6-6.0	0.07-0.16	5.1-7.8	Low----------	0.32		
Rock outcrop.										
CaC--------------	0-4	10-25	1.20-1.40	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.20	3-2	.5-2
Calvin	4-27	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20		
	27-39	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
	39	---	---	---	---	---	-------------	----		
CbC, CbE, CbF----	0-4	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-5.5	Low----------	0.15	3-2	1-4
Calvin	4-27	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20		
	27-39	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
	39	---	---	---	---	---	-------------	----		
CdC*, CdE*, CdF*:										
Calvin----------	0-4	10-25	1.20-1.40	2.0-6.0	0.10-0.18	4.5-5.5	Low----------	0.15	3-2	1-4
	4-27	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20		
	27-39	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
	39	---	---	---	---	---	-------------	----		
Dekalb----------	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low----------	0.17	2	2-4
	4-26	7-18	1.20-1.50	6.0-20	0.06-0.12	3.6-5.5	Low----------	0.17		
	26-36	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low----------	0.17		
	36	---	---	---	---	---	-------------	----		
Berks-----------	0-4	5-23	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.17	3	1-4
	4-22	5-32	1.20-1.60	0.6-6.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	22-31	5-20	1.20-1.60	2.0-6.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	31	---	---	---	---	---	-------------	----		
CeB, CeC, CeD, CfC, CfE, CfF, CfG-------------	0-6	15-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.28	3	1-4
Cateache	6-28	18-35	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	0.28		
	28-32	15-35	1.30-1.60	0.6-2.0	0.08-0.12	5.1-6.0	Low----------	0.28		
	32	---	---	---	---	---	-------------	----		
Ch---------------	0-8	7-18	1.20-1.40	2.0-6.0	0.11-0.18	4.5-7.3	Low----------	0.24	4	.5-4
Chavies	8-41	7-18	1.20-1.40	2.0-6.0	0.11-0.20	4.5-7.3	Low----------	0.24		
	41-65	7-18	1.30-1.50	2.0-6.0	0.08-0.18	4.5-6.0	Low----------	0.24		
CuB, CuC, CuD, CuE, CuF--------	0-1	15-27	1.20-1.40	0.6-6.0	0.14-0.20	5.1-6.0	Low----------	0.32	3	1-4
Culleoka	1-21	18-35	1.20-1.50	0.6-6.0	0.12-0.20	5.1-6.0	Low----------	0.28		
	21-33	18-45	1.20-1.50	0.6-6.0	0.05-0.14	5.1-5.5	Low----------	0.17		
	33	---	---	---	---	---	-------------	----		
DhC*, DhE*, DhF*:										
Dekalb----------	0-4	10-20	1.20-1.50	6.0-20	0.08-0.12	3.6-5.5	Low----------	0.17	2	2-4
	4-26	7-18	1.20-1.50	6.0-20	0.06-0.12	3.6-5.5	Low----------	0.17		
	26-36	5-15	1.20-1.50	>6.0	0.05-0.10	3.6-5.5	Low----------	0.17		
	36	---	---	---	---	---	-------------	----		

See footnote at end of table.

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
DhC*, DhE*, DhF*:										
Hazleton--------	0-2	7-18	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.15	3	2-4
	2-30	7-18	1.20-1.40	2.0-20	0.08-0.12	3.6-5.5	Low----------	0.15		
	30-50	5-15	1.20-1.40	2.0-20	0.06-0.12	3.6-5.5	Low----------	0.15		
	50	---	---	---	---	---	-------------	----		
DuB, DuC--------- Duffield	0-8	15-30	1.10-1.40	0.6-2.0	0.16-0.22	4.5-6.0	Low----------	0.32	4	1-2
	8-37	20-42	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Moderate-----	0.28		
	37-46	18-41	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Moderate-----	0.28		
	46	---	---	---	---	---	-------------	----		
ElF-------------- Elliber	0-2	10-20	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.17	3	1-3
	2-65	12-27	1.40-1.60	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.17		
FaC, FaE, FaF---- Faywood	0-8	15-27	1.30-1.40	0.6-2.0	0.18-0.22	6.1-7.8	Low----------	0.37	3	1-4
	8-28	35-60	1.35-1.45	0.06-0.6	0.12-0.17	6.1-7.8	Moderate-----	0.28		
	28	---	---	---	---	---	-------------	----		
GaC, GaE--------- Gauley	0-9	3-15	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.17	2	2-4
	9-23	5-18	1.20-1.40	2.0-6.0	0.07-0.12	3.6-5.5	Low----------	0.17		
	23-35	5-18	1.20-1.40	2.0-6.0	0.06-0.10	3.6-5.5	Low----------	0.17		
	35	---	---	---	---	---	-------------	----		
Ho--------------- Holly	0-4	15-27	1.20-1.40	0.6-2.0	0.20-0.24	5.6-6.5	Low----------	0.28	5	2-5
	4-42	18-30	1.20-1.50	0.2-2.0	0.17-0.21	5.1-6.5	Low----------	0.28		
	42-65	10-27	1.20-1.45	0.6-6.0	0.10-0.20	5.6-6.5	Low----------	0.28		
LeC-------------- Leatherbark	0-5	7-27	1.20-1.50	0.6-2.0	0.10-0.17	3.6-5.5	Low----------	0.20	3	2-4
	5-35	18-35	1.30-1.50	0.2-0.6	0.09-0.17	3.6-5.5	Low----------	0.28		
	35-38	18-35	1.30-1.50	0.2-0.6	0.09-0.13	3.6-5.5	Low----------	0.28		
	38	---	---	---	---	---	-------------	----		
LlB, LlC, LlD---- Lily	0-2	7-27	1.20-1.40	0.6-6.0	0.13-0.18	3.6-5.5	Low----------	0.28	2	.5-4
	2-32	18-35	1.25-1.35	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	32	---	---	---	---	---	-------------	----		
Lo--------------- Lobdell	0-10	15-27	1.20-1.40	0.6-2.0	0.20-0.24	5.1-7.3	Low----------	0.37	5	1-3
	10-28	18-30	1.25-1.60	0.6-2.0	0.17-0.22	5.1-7.3	Low----------	0.37		
	28-65	15-30	1.20-1.60	0.6-6.0	0.12-0.18	5.6-7.3	Low----------	0.37		
LyB, LyC--------- Lodi	0-6	12-25	1.20-1.50	0.6-6.0	0.14-0.18	4.5-5.5	Low----------	0.37	4	.5-2
	6-21	10-50	1.30-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Moderate-----	0.28		
	21-47	35-60	1.35-1.65	0.6-2.0	0.10-0.18	4.5-5.5	Moderate-----	0.28		
	47-65	10-50	1.35-1.65	0.6-2.0	0.10-0.18	4.5-5.5	Moderate-----	0.28		
MaB, MaC, MaD---- Macove	0-4	10-25	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.20	5	.5-2
	4-14	10-30	1.20-1.50	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.20		
	14-65	10-30	1.20-1.50	2.0-6.0	0.08-0.12	4.5-5.5	Low----------	0.20		
McC, McE--------- Macove	0-4	10-25	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.17	5	.5-2
	4-14	10-25	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.20		
	14-65	10-30	1.20-1.50	2.0-6.0	0.08-0.12	4.5-5.5	Low----------	0.20		
MdC, MdD--------- Mandy	0-5	7-25	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.24	3	.5-3
	5-28	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	28-36	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	36	---	---	---	---	---	-------------	----		

See footnote at end of table.

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
MfC, MfE, MfF, MfG------------- Mandy	0-5	7-25	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low----------	0.20	3	.5-3
	5-28	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	28-36	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low----------	0.17		
	36	---	---	---	---	---	-------------	----		
Mh. Medihemists										
MrB-------------- Mertz	0-3	10-27	1.20-1.40	0.6-2.0	0.14-0.18	5.1-6.0	Low----------	0.28	4	1-3
	3-54	15-35	1.40-1.60	0.2-0.6	0.08-0.18	5.1-6.0	Low----------	0.17		
	54-65	15-35	1.40-1.60	0.2-0.6	0.08-0.18	4.5-5.5	Low----------	0.17		
MzC, MzE--------- Mertz	0-3	10-18	1.20-1.40	0.6-2.0	0.08-0.11	5.1-6.0	Low----------	0.28	4	1-3
	3-54	15-35	1.40-1.60	0.2-0.6	0.07-0.12	5.1-6.0	Low----------	0.17		
	54-65	15-35	1.40-1.60	0.2-0.6	0.07-0.12	4.5-5.5	Low----------	0.17		
Or--------------- Orrville	0-9	12-27	1.25-1.45	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.37	5	2-4
	9-40	18-30	1.30-1.50	0.6-2.0	0.15-0.19	5.1-6.5	Low----------	0.37		
	40-65	10-25	1.20-1.40	0.6-6.0	0.08-0.15	5.1-6.5	Low----------	0.37		
Ph--------------- Philo	0-9	10-18	1.20-1.40	0.6-2.0	0.14-0.20	4.5-6.0	Low----------	0.37	5	2-4
	9-33	10-18	1.20-1.40	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.32		
	33-40	10-18	1.20-1.50	>6.0	0.05-0.10	4.5-6.0	Low----------	0.24		
	40-65	5-18	1.20-1.50	>6.0	0.03-0.06	4.5-6.0	Low----------	0.17		
Po--------------- Potomac	0-10	7-15	1.20-1.40	0.6-6.0	0.10-0.14	5.1-7.3	Low----------	0.24	3	0-2
	10-65	4-10	1.30-1.60	>6.0	0.03-0.06	5.1-7.3	Low----------	0.17		
Pt--------------- Potomac	0-10	5-12	1.20-1.40	>6.0	0.04-0.08	5.1-7.3	Low----------	0.17	3	0-2
	10-65	4-10	1.30-1.60	>6.0	0.03-0.06	5.1-7.3	Low----------	0.17		
Pu--------------- Purdy	0-5	18-35	1.30-1.50	0.2-0.6	0.18-0.24	3.6-5.5	Moderate-----	0.43	3	2-4
	5-38	35-50	1.30-1.60	<0.2	0.12-0.18	3.6-5.5	Moderate-----	0.32		
	38-65	35-50	1.30-1.60	<0.2	0.10-0.16	3.6-5.5	Moderate-----	0.32		
Sc--------------- Sees	0-8	20-35	1.20-1.40	0.2-2.0	0.17-0.22	5.1-7.3	Low----------	0.37	3	2-5
	8-58	35-50	1.40-1.60	0.06-0.2	0.11-0.20	5.1-7.3	Moderate-----	0.28		
	58-65	40-60	1.50-1.60	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.28		
Se--------------- Sensabaugh	0-6	8-25	1.25-1.40	0.6-6.0	0.12-0.18	6.1-7.3	Low----------	0.24	5	1-3
	6-21	18-35	1.30-1.50	0.6-6.0	0.10-0.16	6.1-7.3	Low----------	0.20		
	21-40	12-35	1.30-1.50	0.6-6.0	0.10-0.15	6.1-7.3	Low----------	0.17		
	40-65	12-38	1.25-1.50	0.6-6.0	0.08-0.14	6.1-7.3	Low----------	0.17		
ShB, ShC--------- Shouns	0-3	10-20	1.35-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low----------	0.32	5	1-3
	3-6	10-25	1.35-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	0.28		
	6-40	27-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.28		
	40-65	27-35	1.40-1.60	0.6-2.0	0.09-0.15	4.5-6.0	Low----------	0.28		
SsC, SsE, SsF---- Shouns	0-3	15-27	1.35-1.50	0.6-2.0	0.11-0.18	4.5-6.0	Low----------	0.20	5	.5-3
	3-40	27-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.28		
	40-65	27-35	1.40-1.60	0.6-2.0	0.09-0.15	4.5-6.0	Low----------	0.28		
SwE-------------- Snowdog	0-2	7-27	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20	3	1-4
	2-16	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	16-40	18-35	1.40-1.70	0.06-0.6	0.08-0.12	3.6-5.5	Low----------	0.24		
	40-65	7-40	1.20-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low----------	0.17		

See footnote at end of table.

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Tg--------------- Tioga	0-10	5-18	1.15-1.40	0.6-6.0	0.15-0.21	5.1-7.3	Low----------	0.37	5	2-6
	10-38	5-18	1.15-1.45	0.6-6.0	0.07-0.20	5.1-7.3	Low----------	0.28		
	38-65	3-15	1.25-1.55	0.6-20	0.02-0.20	5.6-7.8	Low----------	0.28		
TrC-------------- Trussel	0-6	7-25	1.20-1.50	0.6-2.0	0.10-0.17	3.6-5.5	Low----------	0.20	4	1-4
	6-18	18-35	1.30-1.50	0.6-2.0	0.09-0.17	3.6-5.5	Low----------	0.28		
	18-35	18-27	1.40-1.70	0.06-0.6	0.09-0.13	3.6-5.5	Low----------	0.24		
	35-65	18-27	1.30-1.60	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.24		
Uf*: Udifluvents.										
Fluvaquents.										
Us. Udorthents										
WeC, WeD, WeF---- Weikert	0-6	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.28	2	1-3
	6-15	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.28		
	15	---	---	---	---	---	-------------	----		

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 18.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "frequent," "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	Frequency of flooding	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft			In				
AlB, AlC: Allegheny	B	None	>6.0	---	---	>60	---	Low	Low	High.
At: Atkins	D	Frequent	0-1.0	Apparent	Nov-Jun	>60	---	High	High	Moderate.
BaB, BaC, BaD, BbC, BbE, BbF: Belmont	B	None	>6.0	---	---	40-60	Hard	Moderate	Moderate	Moderate.
BeB, BeC, BeD, BeE, BfC, BfE, BfF: Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
BgC*, BgE*, BgF*:										
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
Dekalb	A	None	>6.0	---	---	20-40	Hard	Low	Low	High.
BhG*:										
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
Weikert	C/D	None	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.
Calvin	C	None	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
BlC, BlE, BlF: Blackthorn	B	None	>6.0	---	---	>60	---	Low	Moderate	High.
BoB: Blairton	C	None	1.0-2.0	Perched	Nov-Mar	20-40	Soft	High	High	High.
BrF*:										
Briery	C	None	>6.0	---	---	>60	---	Moderate	Low	Low.
Rock outcrop.										

See footnote at end of table.

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table			Bedrock		Potential frost action	Risk of corrosion	
			Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
			Ft			In				
CaC, CbC, CbE, CbF: Calvin	C	None	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
CdC*, CdE*, CdF*:										
Calvin	C	None	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
Dekalb	A	None	>6.0	---	---	20-40	Hard	Low	Low	High.
Berks	C	None	>6.0	---	---	20-40	Soft	Low	Low	High.
CeB, CeC, CeD, CfC, CfE, CfF, CfG: Cateache	C	None	>6.0	---	---	20-40	Soft	Moderate	Moderate	Moderate.
Ch: Chavies	B	Rare	>6.0	---	---	>60	---	Moderate	Low	Moderate.
CuB, CuC, CuD, CuE, CuF: Culleoka	B	None	>6.0	---	---	20-40	Soft	Moderate	Low	Moderate.
DhC*, DhE*, DhF*:										
Dekalb	A	None	>6.0	---	---	20-40	Hard	Low	Low	High.
Hazleton	B	None	>6.0	---	---	40-60	Hard	Moderate	Low	High.
DuB, DuC: Duffield	B	None	>6.0	---	---	>40	Hard	Moderate	Moderate	Moderate.
ElF: Elliber	A	None	>6.0	---	---	>60	---	Moderate	Low	High.
FaC, FaE, FaF: Faywood	C	None	>6.0	---	---	20-40	Hard	Moderate	High	Moderate.
GaC, GaE: Gauley	C	None	>6.0	---	---	20-40	Hard	Moderate	Low	High.
Ho: Holly	D	Frequent	0-1.0	Apparent	Dec-May	>60	---	High	High	Moderate.

See footnote at end of table.

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft			In				
LeC--------------- Leatherbark	C	None------------	0.5-1.0	Perched	Nov-Apr	20-40	Soft	High-----	High-----	High.
LlB, LlC, LlD----- Lily	B	None------------	>6.0	---	---	20-40	Hard	Moderate	Moderate	High.
Lo---------------- Lobdell	B	Occasional------	1.5-2.0	Apparent	Dec-Apr	>60	---	High-----	Low------	Moderate.
LyB, LyC---------- Lodi	B	None------------	>6.0	---	---	>60	---	Moderate	Moderate	High.
MaB, MaC, MaD, McC, McE--------- Macove	B	None------------	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
MdC, MdD, MfC, MfE, MfF, MfG---- Mandy	C	None------------	>6.0	---	---	20-40	Soft	Low------	Low------	High.
Mh. Medihemists										
MrB, MzC, MzE----- Mertz	C	None------------	>6.0	---	---	>60	---	Moderate	Moderate	High.
Or---------------- Orrville	C	Occasional------	1.0-2.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Moderate.
Ph---------------- Philo	B	Occasional------	1.5-3.0	Apparent	Dec-Apr	>60	---	Moderate	Low------	High.
Po, Pt------------ Potomac	A	Frequent--------	4.0-6.0	Apparent	---	>60	---	Low------	Low------	Moderate.
Pu---------------- Purdy	D	None------------	+1-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	High.
Sc---------------- Sees	C	Rare------------	1.0-2.0	Perched	Jan-Apr	>60	---	High-----	Moderate	Low.
Se---------------- Sensabaugh	B	Occasional------	4.0-6.0	Apparent	Jan-Apr	>60	---	Moderate	Low------	Low.

See footnote at end of table.

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
			Ft			In				
ShB, ShC: Shouns	B	None	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
SsC, SsE, SsF: Shouns	B	None	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
SwE: Snowdog	C	None	1.5-2.5	Perched	Nov-May	>60	---	Moderate	Moderate	High.
Tg: Tioga	B	Occasional	3.0-6.0	Apparent	Feb-Apr	>60	---	Moderate	Low	Moderate.
TrC: Trussel	C	None	0-0.5	Perched	Oct-Jun	>60	---	High	High	High.
Uf*: Udifluvents.										
Fluvaquents.										
Us. Udorthents										
WeC, WeD, WeF: Weikert	D	None	>6.0	---	---	10-20	Soft	Moderate	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 19.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, mesic Typic Hapludults
Atkins	Fine-loamy, mixed, acid, mesic Typic Fluvaquents
Belmont	Fine-loamy, mixed, mesic Typic Hapludalfs
Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Blackthorn	Loamy-skeletal, mixed, mesic Typic Hapludults
Blairton	Fine-loamy, mixed, mesic Aquic Hapludults
Briery	Loamy-skeletal, mixed, nonacid, frigid Typic Udorthents
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Cateache	Fine-loamy, mixed, mesic Ultic Hapludalfs
Chavies	Coarse-loamy, mixed, mesic Ultic Hapludalfs
Culleoka	Fine-loamy, mixed, mesic Ultic Hapludalfs
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Duffield	Fine-loamy, mixed, mesic Ultic Hapludalfs
Elliber	Loamy-skeletal, mixed, mesic Typic Hapludults
Faywood	Fine, mixed, mesic Typic Hapludalfs
Fluvaquents	Fluvaquents
Gauley	Loamy-skeletal, siliceous, frigid Typic Haplorthods
Hazleton	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Holly	Fine-loamy, mixed, nonacid, mesic Typic Fluvaquents
Leatherbark	Fine-loamy, mixed, frigid Aquic Dystrochrepts
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Lobdell	Fine-loamy, mixed, mesic Fluvaquentic Eutrochrepts
Lodi	Clayey, mixed, mesic Typic Hapludults
Macove	Loamy-skeletal, mixed, mesic Typic Hapludults
Mandy	Loamy-skeletal, mixed, frigid Typic Dystrochrepts
Medihemists	Medihemists
Mertz	Loamy-skeletal, mixed, mesic Typic Hapludults
Orrville	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Philo	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Potomac	Sandy-skeletal, mixed, mesic Typic Udifluvents
Purdy	Clayey, mixed, mesic Typic Ochraquults
*Sees	Fine, mixed, mesic Aquollic Hapludalfs
Sensabaugh	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Shouns	Fine-loamy, mixed, mesic Typic Hapludults
Snowdog	Fine-loamy, mixed, frigid Typic Fragiochrepts
Tioga	Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Trussel	Fine-loamy, mixed, frigid Aeric Fragiaquepts
Udifluvents	Udifluvents
Udorthents	Udorthents
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at helpdesk@helpdesk.itc.nrcs.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.