United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Maryland Agricultural
Experiment Station, Board
of County Commissioners
of Worcester County,
Worcester Soil
Conservation District, and
Maryland Department of
Agriculture

Soil Survey of Worcester County, Maryland

How to Use This Soil Survey

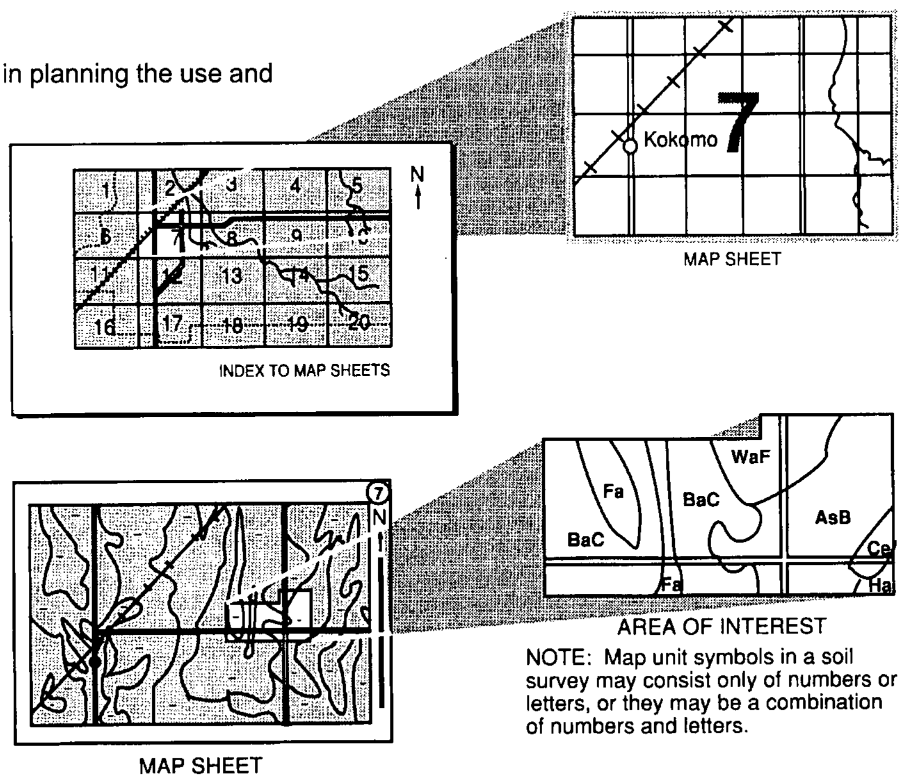
General Soil Map

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

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

Detailed Soil Maps

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



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

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

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

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

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1996. This soil survey was made cooperatively by the Natural Resources Conservation Service, the Maryland Agricultural Experiment Station, the Board of County Commissioners of Worcester County, the Worcester Soil Conservation District, and the Maryland Department of Agriculture. The survey is part of the technical assistance furnished to the Worcester Soil Conservation District. Partial funding for the survey was provided by Worcester County.

Cover: Spatterdock and baldcypress in an area of Mannington and Nanticoke soils located along Nassawango Creek.

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

Contents

Issued 2004

Foreword

This soil survey contains information that affects land use planning in Worcester County. 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 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 decisions for land use or land treatment. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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

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

David P. Doss
State Conservationist
Natural Resources Conservation Service

Soil Survey of Worcester County, Maryland

Updated and revised survey by George P. Demas and John L. Burns,
Natural Resources Conservation Service

Original survey by Richard L. Hall, Soil Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Maryland Agricultural Experiment Station, Board of County Commissioners of Worcester County, Worcester Soil Conservation District, and Maryland Department of Agriculture

WORCESTER COUNTY is located in the southeastern part of Maryland in a region known as the Delmarva Peninsula (fig. 1). It has an area of 309,720 acres, or about 450 square miles. Snow Hill, the county seat, is located near the geographic center of the county. The year-round population of the county is about 31,000.

The eastern third of the county borders the Atlantic Ocean and ocean coastal bays. It is characterized by nearly level to strongly sloping formations, such as the sea escarpment, barrier islands, and tidal marshes. Streams generally flow to the east and drain into the Assawoman, Chincoteague, and Sinepuxent Bays. The middle portion of the county is characterized by nearly level and gently sloping, low-lying upland flats in the Pocomoke River basin. The western section of the county is nearly level to moderately sloping, and the northwestern corner has dominantly dunal topography. Streams flow to the Pocomoke River generally from north to south. Most of the county lies within the Chesapeake Bay Watershed (via the Pocomoke River), and the rest drains to the Atlantic Ocean (via the coastal bays).

Farming and tourism are the two main economic enterprises in Worcester County. The climate of the county generally favors the production of cash-grain crops and poultry. The major crops are corn, soybeans, and wheat. Livestock production includes poultry and hogs. There is also limited production of truck crops, such as sweet corn, tomatoes, cucumbers, and squash, for market at roadside stands. Ocean City, extending the length of Fenwick Island, is a major tourist attraction and vacation area due to its proximity to Baltimore, Washington, and Philadelphia. It is also home to the county's seafood industry. There are numerous parks, such as the Assateague Island National Seashore and Pocomoke River State Forest, which are used for camping, hiking, and other outdoor activities. The Pocomoke River, nationally designated as a Wild and Scenic River of the United States, is also a major attraction for canoeing and wildlife enthusiasts.

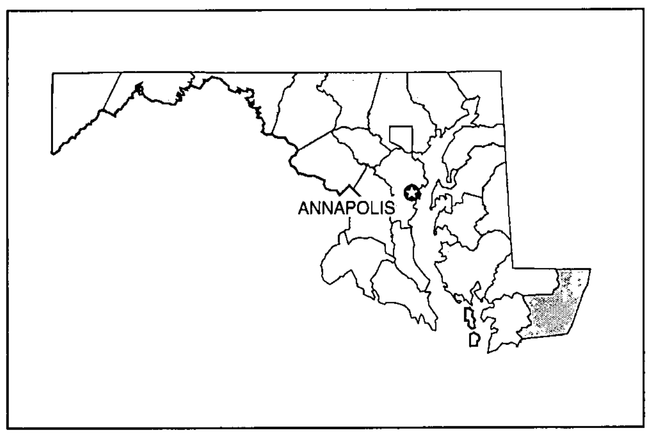


Figure 1.—Location of Worcester County in Maryland.

The soils in the county range widely in texture, natural drainage, and other characteristics. Soils in the eastern third of the county along the coast are generally nearly level, moderately well drained or well drained, and sandy throughout. Those in the middle third of the county are nearly level or gently sloping. They are dominantly poorly drained to moderately well drained and are loamy or silty throughout. In the western third of the county, the soils are generally nearly level to moderately sloping. They are dominantly poorly drained to moderately well drained and are sandy throughout. The major concerns in managing the soils for cultivated crops are wetness, in the middle part of the county, and erosion, in the eastern and western parts.

This soil survey updates the survey of Worcester County published in 1973 *(22)*. It provides additional soils information and has larger maps which show the soils in greater detail. Most of the differences from the 1973 survey are a result of changes in soil classification, the use of infrared photography, and an increase in the intensity of mapping.

General Nature of the County

This section gives general information about Worcester County. It describes the history and development; industry and transportation; physiography, relief, and drainage; water supply; agriculture; natural resources; and climate.

History and Development

The first known recorded inhabitants of the survey area were Native Americans. The Algonquin tribe, the largest of the local tribes, and the Pocomoke, Assateague, Delaware, Annamessex, and Nanticoke tribes were located throughout what is now known as the Lower Eastern Shore *(40)*. The survey area has a long history of occupation by Native Americans, as evidenced by the numerous artifacts found in the region. Originally, the early inhabitants had a hunting and gathering culture. During the Woodland Period (1000 B.C. to 1600 A.D.), settlement became more oriented towards riverine environments. During this period, cooking and storage pottery were developed and local clay beds were utilized for the raw material. Another significant change occurred when the bow and arrow was introduced around 800 A.D. Near the end of this period, the Native Americans gradually settled into large, often fortified, permanent villages and began more intensive cultivation of corn, beans, and squash. Wide-ranging trade networks were established and continued to function until the first English settlers arrived *(30)*. Many of the local names of towns and rivers in Worcester County are of Native American origin.

In 1524, Giovanni Verrazano became the first European explorer to document a visit to the survey area *(6)*. He and his crew travelled north through Chincoteague Bay, eventually putting ashore near present-day South Point. Verrazano named the area Acadia in his journal. The bridge near South Point joining the mainland and Assateague Island was named the Verrazano Bridge. In 1603, Bartholomew Gilbert became the first explorer to sail beyond the Pocomoke Sound and up the Pocomoke River. In 1608, Captain John Smith, who is known for his detailed account of his journey into Chesapeake Bay, was the first English explorer to document a visit to the Lower Eastern Shore. During the course of his journey, he traveled up the Pocomoke River in search of fresh water. Other than these occasional explorers, very few people came to the survey area during the early 1600's. During the 1650's, to encourage settlement of the area, patents were given to individuals for property tracts in the area. Even with the opportunity to own land, however, the influx of European settlers to the area remained limited. The early settlers were almost all English, and they brought with them many indentured servants. Men and women from Africa were brought to the area and used as slave labor, mainly for the production of tobacco and flax. Because of their knowledge of agricultural production methods, especially concerning the cultivation of corn and tobacco, local Native Americans were also enslaved and forced to work on farms. Tobacco was used as a medium of exchange for almost 100 years because hard currency was in very short supply.

In 1642, the town of Snow Hill was founded by English settlers and named for their hometown just outside London, England. Snow Hill was the northernmost navigable point on the Pocomoke River. Pocomoke City was also settled early in the county's history as a port for the area. Three shipyards were established in Pocomoke City, which was originally called Newtown. Abundant baldcypress was a key resource for these shipyards. Because transportation was mainly by water at this time, a majority of the first settlements were located along or near navigable bodies of water *(23)*.

During this period, settlers and Native Americans began to encroach on each other's land and there were numerous skirmishes. The settlers also had unknowingly brought smallpox and malaria to the indigenous population. Between 1608 and 1700, it was estimated that the Native American population dropped by almost 90 percent due to the new diseases. In 1669, Lord Baltimore officially formed two counties on the Delmarva Peninsula, Somerset for the lower shore, and Durham for the northern shore. As more settlers arrived, more problems arose. In 1670, a treaty was signed between Lord Baltimore and the local Native American tribes. The treaty set up reservations where no settlers were allowed, but a majority of the land was very poorly drained and overgrown with dense swamp vegetation.

Until 1742, all the land in the survey area was part of Somerset County. In that year a new county was formed from a portion of Somerset County and named for the Earl of Worcester. Snow Hill was designated as the county seat. Worcester County was originally much larger than it is today. The northwestern and northern portions of the county eventually became part of Wicomico County, Maryland, and Sussex County, Delaware. Also in 1742, a final peace treaty was signed by Lord Baltimore and the Native Americans in the hope of reducing the hostilities between the natives and settlers. By this time, however, the local tribes had been pressured so much that most had already begun to migrate northward. By the 1750's, only a remnant of the original tribes remained.

To resolve disputes between the English colonial families of Calvert and Penn, the first surveyed line on the lower Eastern Shore was the Transpeninsula Line. The line runs 69.9313 miles from Fenwick Island, Maryland, due west to the Chesapeake Bay. The colonial surveyors marked the half-way point with a stone that they called "Middle Point." Charles Mason and Jeremiah Dixon surveyed the north-south boundary between Delaware and Maryland in 1761 and again in 1764. A total of 93 markers were placed along the line *(10)*. The stones were oolitic limestone from the Isle of Dorsetshire in England. They either had a "P" and "M" carved on opposite sides (1-mile stones) or had the Calvert coat-of-arms and Penn coat-of-arms carved on opposite sides (5-mile stones).

In 1788, Worcester County gained some of the first iron smelting sites. The Iron Furnace, located along Nassawango Creek, was one of the largest in the region. Iron ore was mined from the creek in the form of bog iron, which produced a medium-grade iron. At its peak, the Iron Furnace had a population of 400. In 1848, the Iron Furnace was closed due to the falling prices and increasing supply of high-grade iron.

During the American Civil War, the county was not directly involved in any large battles due to its geographic isolation. The war was most often manifested in the county in small skirmishes and slave revolts. Because of the rural nature of the county, distance from large cities, and the concentration of troops on the western side of the Chesapeake Bay, the Pocomoke River was used for safely transporting escaped slaves during their journey north and called the "Underground River."

In the 1900's, agriculture increased in importance for both food production and needs of the war efforts. Truck crops, such as corn, tomatoes, and potatoes, were produced for local use and for the urban centers of Baltimore and Philadelphia. Crops such as hemp were produced for rope needs during the war. Eventually, poultry and grain production grew to primary importance. Also in the 1900's, Ocean City grew as a beach resort and the barrier islands were designated as national wildlife refuges.

Industry and Transportation

The economy of Worcester County is based mainly on agriculture and tourism. The chief agricultural crops are corn, soybeans, and wheat. Much of the corn and soybeans is utilized for poultry feed. Poultry farming is the largest livestock industry in the county. In 1990, Worcester County ranked 4th in the United States in chicken production. There are two large mills in the county that store and process grain for livestock. Other crops, such as sweet corn, squash, cucumbers, green beans, and tomatoes, are grown for sale at roadside stands. In addition to on-farm employment, there is also significant employment in service industries directly associated with agriculture. These industries include farm machinery sales and repair; seed, lime, and fertilizer sales; and poultry house construction. In addition, two saw mills are in operation and support a timber industry centered on pine lumber.

From spring through early fall, employment increases in Worcester County due to the increase in tourism. Ocean City, a town of 12,000 year-round residents, can have a population near 350,000 on weekends during summer. Many shops and markets open for the tourist season and supply employment for the summer months. Ocean City is a major attraction for vacationers from Baltimore, Washington, and Philadelphia. There is a wide variety of entertainment available, including the boardwalk and the beach. During the past 10 years, there has also been an increase in environmental tourism. Canoeing, fishing, and wildlife watching are major attractions for Nassawango Creek and the Pocomoke River. Blue herons and bald eagles are regular sights along the Pocomoke River.

Until the early mid-1900's, the main mode of transportation in Worcester County, and on the Delmarva Peninsula, was the railroad. The chief materials shipped by rail are agricultural products and grain. Most of the shipping now is done by truck. Modern highways provide a direct connection to markets north and south of Snow Hill. U.S. Highway 50 runs east-west through the northern portion of the county and is a major route for travelers going to Ocean City. U.S. Highway 113 runs northwest-southeast through the county and is a major trucking route for the East Coast. It runs from Dover, Delaware, to Cape Charles at the southernmost tip of the Delmarva Peninsula. Another north-south highway, U.S. Highway 13, runs almost parallel to U.S. Highway 113 and goes through Salisbury. U.S. Highways 13 and 113 meet in Dover, Delaware, and in Pocomoke City, Maryland. The relatively isolated nature of the county changed after the construction of the three highways, the Chesapeake Bay Bridge (in 1955), and the Chesapeake Bay Bridge-Tunnel (in 1964).

Physiography, Relief, and Drainage

Worcester County is part of the northern tidewater region of the mid-Atlantic Coastal Plain. Although located entirely within the coastal plain province, the county can be subdivided into four general physiographic areas. About 10 percent of the county comprises the barrier islands and tidal marshes adjacent to the coastal bays. The tidal marshes are flooded twice daily by saltwater and drained through an extensive system of creeks. The barrier island is nearly level to steep and can be flooded or subject to overwash events during storms. About 5 percent of the county is located along the remnants of the Suffolk sea escarpment on the eastern edge of the mainland. Although it is discontinuous, the sea escarpment runs southwest to northeast roughly parallel to the coast and approximately 2 to 3 miles inland. It is steep in many places and has elevations of about 35 feet. About 50 percent of the county is located within the Pocomoke River valley in the central part of the county. Elevations in this area range from 0 to 45 feet. Adjacent to the river are some steep bluffs, but the majority of the area consists of broad flats. The remainder of the county is a dissected upland plateau, located in the western part of the county. This area is characterized by ridge-swale topography, and parabolic dunes are common. Elevations range from 15 to 65 feet.

All of the soils in the county are underlain by unconsolidated sediments consisting of sand, silt, clay, gravel, organic material, and shell fragments. The depth to crystalline bedrock ranges from about 5,800 feet near Whiton to approximately 8,000 feet at Ocean City *(37)*. The elevation of most of the county generally ranges from 0 to 50 feet. The highest point, 65 feet, is located in a wooded tract about 1 mile southwest of the Iron Furnace.

About two-thirds of the county is drained by the Pocomoke River, which empties into Chesapeake Bay. Nassawango Creek and Dividing Creek are the two largest tributaries of the Pocomoke River. The remaining third of the county drains to the Chincoteague, Assawoman, and Sinepuxent Bays. The St. Martins River and Trappe Creek are the main tributaries of the coastal bays.

Water Supply

Worcester County has an abundant supply of both surface and subsurface water. Depth to the water table generally is less than 25 feet. Most of the older drinking wells in the county are shallow wells (less than 100 feet deep), except for those used by the towns of Berlin, Ocean City, Pocomoke, and Snow Hill. The shallow wells vary greatly in water quality, depending on the location. Because ground water is generally recharged through infiltration of rainwater, the uppermost aquifer is directly impacted by land use.

In the larger towns, the wells are much deeper and draw off of the Columbia, Yorktown-Cohansey, or Manokin aquifers. The recharge areas for these aquifers are in Somerset and Wicomico Counties and on the Virginia mainland. During winter, when vegetation is dormant, precipitation soaks into the soil and recharges the aquifer. During spring and summer, much of the rainfall is utilized by plants and returned to the atmosphere by evapotranspiration. Generally, water tables are highest in late winter and lowest in fall.

Although iron and nitrogen compounds are the most common contaminants, salt intrusion is a problem for wells drilled along the coast. Wells for Ocean City have occasionally been extended or re-drilled to a greater depth because of salt intrusion. When the rate of water removal is too great, saltier water from the Atlantic Ocean flows in to fill the void.

Agriculture

Farming is the basis for much of the economy in Worcester County. Approximately 40 percent of the county, or 123,000 acres, is farmland. A vast majority of farms have poultry houses. There are about 474 farms in the county, a decrease from 824 in 1964. The average farm size is 227 acres, an increase from 169 acres in 1964. About 85,000 acres is cropland; 4,000 acres, pasture; and the remainder, small woodlots. There are more than 140,000 acres currently forested *(29)*.

The production of poultry is by far the largest farm enterprise in the county. Nearly 100 million chickens are raised each year, and sales of poultry account for 77 percent of total farm sales. Very little income comes from other livestock. There are about 25,000 hogs, 2,500 cattle, and 150 milk cows produced in areas throughout the county.

Corn and soybeans are the principal crops grown in Worcester County. These two crops account for about 75,000 acres of production. They are used mainly as feed for poultry. Average yields for corn have increased from 51 bushels per acre in 1959 to about 120 bushels per acre at present. Small grains, such as wheat, barley, and rye, are produced on about 12,000 acres. Although it was an important part of the economy in the past, vegetable production has dropped dramatically over the years and includes less than 1,600 acres today. Sweet corn, cucumbers, peas, potatoes, and tomatoes are grown primarily for sale at roadside stands.

Natural Resources

Prior to European contact, the local Native Americans enjoyed a bounty of natural resources. At that time, the survey area was almost completely covered by hardwood forests, except for the swamps, tidal marshes, and barrier islands. Oaks and maples were the dominant species in the upland forests, and Atlantic white-cedar and baldcypress were the dominant species in the wetlands. Very large tracts of forest still remain in the western part of the county and along the Pocomoke River. The harvesting of timber was once the economic mainstay of the county before agriculture surpassed it. It is still important to the county. The preferred plantation tree is currently loblolly pine.

Due to the large expanses of forest, there is also an abundance of wildlife and game animals. On Assateague Island, wild horses that were stranded by early settlers are now protected and are a tourist attraction. Whitetail deer, raccoon, opossum, rabbits, and squirrels inhabit many of the forested tracts in the county. Bald eagle and wild turkey populations have increased dramatically in recent years. The Pocomoke River and coastal bays are home to flounder, sea trout, catfish, largemouth bass, crappie, bluegill, and chain pickerel. In brackish waters there are also substantial populations of blue crabs and clams.

Borrow pits in the eastern and northwestern parts of the county are used for the mining of sand and gravel. Much of the material is used as fill for construction activities.

Climate

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

In winter, the average temperature is 38 degrees F and the average daily minimum temperature is 28 degrees. The lowest temperature on record, which occurred on January 18, 1957, is -6 degrees. In summer, the average temperature is 74 degrees and the average daily maximum temperature is 85 degrees. The highest recorded temperature, which occurred on July 23, 1952, is 101 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 average annual precipitation is about 44.53 inches. Of this, 23.02 inches, or about 51 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 9.07 inches on August 14, 1953. Thunderstorms occur on about 30 days each year, and most occur in July.

The average seasonal snowfall is about 13.5 inches. The greatest snow depth at any one time during the period of record was 22 inches. On the average, 5 days of the year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 18 inches.

The average relative humidity in midafternoon is about 53 percent. Humidity is higher at night, and the average at dawn is about 74 percent. The sun shines 63 percent of the time possible in summer and 48 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10.9 miles per hour, in March.

How This Survey Was Made

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

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they 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-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 the soils. After describing the soils 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 are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

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

This survey area was mapped at two levels of detail. At the more detailed level, map units are narrowly defined. Map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map units are broadly defined. Boundaries were plotted and verified at wider intervals. In the legend for the detailed soil maps, narrowly defined units are indicated by symbols in which the first letter is a capital and the second is lowercase. For broadly defined units, the first and second letters are capitals.

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.

Survey Update Procedures

This survey updates the soil survey of Worcester County published in 1973 *(22)*. It provides additional data and interpretations and larger maps, which show the soils in greater detail. The soils in this survey are described to a greater depth than the previous survey—72 inches or more compared to 40 to 55 inches. Many of the soil series and map unit names have been changed because of new information and changes in the national system for soil classification *(47, 50)*. Though many of the soil boundaries are essentially the same as those in the 1973 report, about 90,000 acres were remapped with new soil boundaries in order to correct errors and increase detail.

The general procedures followed in making the soil survey update are described in the "National Soil Survey Handbook" of the Natural Resources Conservation Service *(45)*. Previous soil surveys of Worcester County *(5, 22, 34)*, the geology map of Worcester County, and the most recent topographic maps were among the reference materials used in the update process. These references were helpful in preparing the manuscript and planning the fieldwork.

Once the fieldwork began, color infrared aerial photographs were utilized extensively to determine the location of soil boundaries in forested areas. They were also used to more accurately locate soil boundaries in cropland. All sites of the representative profiles from the 1973 report were investigated and described using new terminology and nomenclature. They were used as a starting point for evaluating the old map units. Soil boring transects were performed to determine the central, or typical, concept of each soil series and to determine map unit composition. Some areas required remapping, particularly large wooded tracts, tidal marshes, swamps, flood plains, and the coastal beaches. In the previous soil survey, many of these areas were not mapped as a soil series and had little detail. Soil boundaries in remapped areas were determined based on soil descriptions, landscape characteristics, and photo interpretation.

Some of the soil series in the 1973 report could not be used. New information on soil temperature, particle-size distribution, and seasonal high water tables indicated the need for the establishment of new soil series. Many of the analyses were performed by the National Soil Survey Laboratory in Lincoln, Nebraska, or at the Pedology Laboratory, Department of Natural Resource Sciences, University of Maryland. Of the 23 soil series used in the 1973 soil survey, 14 were retained and 9 were removed. Twenty new soil series were added in the update. This publication has a total of 34 soil series.

Formation of the Soils

This section describes the geology and geomorphology of the survey area, the factors of soil formation as they relate to the soils of Worcester County, the major processes in the development of the soils, and the morphology of the soils.

Geology and Geomorphology

The Pocomoke River basin, the largest physiographic region in the county, includes flood plains, scattered ancient sand dunes, low terraces, closed depressions, and broad low-lying upland flats. The closed depressions are referred to as Delmarva bays. They range from less than 1 acre to almost 200 acres in size. Slopes are generally nearly level or gently sloping, but some areas along the edges of flood plains and on the dunes are moderately sloping to steep. Elevations range from 0 to 45 feet.

Nearly level flood plains occur along the Pocomoke River, Nassawango Creek, Dividing Creek, and numerous small tributaries. These flood plains range from more than 1 mile wide along the Pocomoke River to as little as 50 feet wide along the small tributaries. Most of the flood plains are characterized by organic deposits which originated from the growth and decay of vegetation, including baldcypress and Atlantic white-cedar. The thin flood plains are typically composed of mineral material which has been eroded from the surrounding upland soils. The Pocomoke River originates to the north in Sussex County, Delaware, and has major tributaries originating to the northwest in Wicomico County, Maryland, and to the west in Somerset County, Maryland. The name of the river comes from the Native American Algonquin word "Pocomoke," which means "pierced or broken ground." The river is nearly 73 miles long and has a maximum depth of 45 feet. North of Whiton Crossing, the river has been channelized and is not affected by tides. Although it is a freshwater river for most of its length, the Pocomoke River is influenced by tides from just north of Snow Hill and southward and becomes brackish just south of Pocomoke City.

Scattered ancient sand dunes occur on both the east and west sides of the Pocomoke River, but the vast majority of them are to the east. These dunes may be outlying dunes of the Parsonburg Sand Formation or remnant river dunes *(17)*. Radiocarbon dating of peat beds beneath these dunes indicate that the dunes are 13,000 to 30,000 years old *(33)*. The dunes are generally oriented to the southeast, which probably means that the dune-building winds were from the northwest. The dunes are gently sloping to steep and range from 20 to 45 feet in elevation.

The broad low-lying upland flats along the Pocomoke River are nearly level and gently sloping. A poorly defined terrace occurs about 3 miles northwest of the Pocomoke River in the center of the county. It rises from an elevation of about 20 feet to an elevation of 35 to 40 feet. This feature delineates the area where the Omar and Parsonburg Sand Formations meet. Most of the Pocomoke River basin is within the Omar Formation, which is believed to be the bottom of an ancient coastal back-bay, and may reflect the highest stand of the Quaternary seas on the Delmarva Peninsula. Radiometric dating of shells found in this formation have placed ages at 84,000 to 126,000 years old *(33)*. Elevations range from 10 to 45 feet. In some areas, oyster, scallop, and clam shell beds occur buried within 6 feet of the present-day soil surface. Since these organisms live on or in estuarine sediments, this probably means that these shellfish were once inundated continuously with brackish water. The soils are loamy or silty, and, due to the low relief, much of the acreage is poorly drained. Within these flats there are a large number of circular, closed depressions locally known as "whale wallows" or Delmarva bays. These formations occur on many terrace levels in Worcester County and Accomac County, Virginia, and appear to have no recognizable locational pattern *(35)*. These closed depressions typically have sandy sloping rims and loamy, poorly drained centers. The rims may be as much as 5 to 10 feet higher in elevation than the centers. Radiocarbon dating of peat below the rims of a Delmarva bay in Caroline County, Maryland, indicate that the rims began to form about 16,000 to 20,000 years ago *(43)*.

Barrier islands and tidal marshes are located along the eastern edge of the county adjacent to the coastal bays and the Atlantic Ocean. Before the 1930's, the barrier formation was one continuous landform stretching from northeast to southwest. In 1933, a major storm hit the coast and opened the Ocean City Inlet. This resulted in the separation of the barrier island into two sections—Fenwick Island, which is Ocean City, and Assateague Island, which is now a State and National Park. Over the years, the natural tendency of barrier islands is to migrate towards the mainland. Since 1933, Assateague Island has migrated westward more than 200 feet *(28)*. The same processes have also been affecting Fenwick Island, but, due to economic considerations, beach replenishment and hurricane protection projects in Ocean City have maintained the beach in a relatively steady state. Assateague Island, however, has been adversely affected by a deficit in the normal supply of new sediment due to the increased trapping of littoral sediment by the Ocean City Inlet jetty.

Tidal salt marshes occur mainly along the backshore of the barrier islands and within tidal creeks adjacent to Assawoman, Sinepuxent, and Chincoteague Bays. Tidal marshes also occur adjacent to the Pocomoke River, but, unlike the coastal marshes, these areas are only slightly brackish south of the Pocomoke River and are dominantly freshwater marshes to the north. Because of the differences in salinity, the marshes along the Pocomoke River and those in the coastal bays have very different soils and vegetation. In the past, little attention was paid to tidal marsh areas and very little was known about their characteristics. It was not until a comprehensive study indicated the variability of tidal marshes that the mapping of tidal marsh soils in Maryland became more commonplace *(9)*. The tidal marshes along the Pocomoke River are generally deep, organic deposits and formed from the remnants of baldcypress and Atlantic white-cedar swamps. The coastal tidal marshes are brackish to saline, are less organic in nature, and formed dominantly from a mixture of mineral soil material and the remains of saltmarsh cordgrass and saltmeadow cordgrass. The present-day marshes accumulate enough material to keep up with sea-level rise and maintain a somewhat static condition. The marshes in Maryland probably began to form around 4,000 to 5,000 years ago when the rate of sea level rise slowed enough to allow for the deposition of material and subsequent colonization by marsh plants *(4)*.

Adjacent to the tidal marshes between the mainland and barrier islands are more than 70,000 acres of open water in Assawoman, Sinepuxent, and Chincoteague Bays. About 30 percent of the acreage is areas having water less than 6 feet deep. About 9,600 acres of submersed aquatic vegetation occurs in these shallow water areas *(32)*. The sediments in these areas are now considered subaqueous soils because they are presently supporting or capable of supporting vegetation and these materials have undergone soil-forming processes *(12, 13, 16)*. A survey of the shallow water soils of Sinepuxent Bay in Worcester County shows that different soils occur on different underwater landforms and that soils are generally sandy or coarse-loamy adjacent to the barrier island and fine-silty along the mainland *(15)*. At least six different subaqueous soil series have been identified in Sinepuxent Bay *(14)*.

The Suffolk sea escarpment is located along the eastern edge of the county and is moderately sloping to steep. It generally runs parallel to the coast and is about 3 to 6 miles inland. This feature is believed to be an ancient beach or barrier island and evidence of a much higher sea level *(17)*. It is located within the Ironshire Formation. Samples of peat below this formation indicate an age of 45,000 years old *(33)*. In some places, such as near Cedartown and Spence, the escarpment is well defined. To the south near Stockton and to the north near Berlin, this feature is much harder to discern.

The dissected upland plateau of the western portion of the county is dominated by the Parsonburg Sand Formation *(33)*. Dune and swale topography is common in this area, and slopes are generally nearly level to steep. This formation appears to have been a migrating dune field which advanced into the northern part of the survey area *(18)*. The flood plains within this area are dominantly sandy mineral material washed in from the adjacent dunes. The two major drainage systems in this portion of the county are Nassawango and Dividing Creeks. Both creeks are tributaries of the Pocomoke River. Although there are many well defined ridges, the actual change in elevation to the swales is not great. For this reason, there are many low-lying areas which have impeded drainage. This factor, along with the predominance of pine vegetation, may have led to the development of soils with spodic horizons *(7, 18)*. These soils are extremely low in iron and attain much of their color from organic matter complexes.

The survey area, due in part to its location adjacent to the Atlantic Ocean, has undergone many geologic and geomorphic changes during the past 200,000 years. The fluctuations of sea level from about 100 feet below to 100 feet above the present level have had major impacts on the physical nature of the survey area *(51)*. At a higher sea level, the Pocomoke River basin was entirely flooded with ocean water. The Suffolk sea escarpment along the eastern edge of the mainland is probably the remnant of an old barrier island. Shell beds and old marsh surfaces occurring 6 feet below the surface in the Pocomoke River valley indicate that there was a significant population of oysters, scallops, and clams in this ancient back-bay. Assateague Island would have ran from present-day Berlin through Stockton, and Chincoteague Bay would have been where the Pocomoke River is today. During drier periods, when sea level was down, sand dunes migrated down the Delmarva Peninsula and left behind the snaking ridges which run through the middle of relatively flat topography today.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and/or organic materials at the earth's surface. It supports, or is capable of supporting, rooted plants in the natural environment *(50)*. The characteristics of a soil at a given site are the result of the interaction of five general factors—climate, organisms (plants and animals), parent material, relief (topography), and time *(26)*. In addition to these five soil-forming factors, the term "dot factor" is used for processes which do not fit within the accepted five factors *(27)*. The dot factor takes into account the energy associated with running water and other processes, such as fires, which affect soil formation. The dot factor is of particular importance in the formation of subaqueous soils. Theoretically, if all the soil-forming factors were identical at different sites, the soils at the different sites would be identical. Differences among soils are a result of variations in one or more of these factors.

Climate

Climatic factors, such as precipitation and temperature, have strongly influenced the soils of Worcester County. Temperature determines the rate of physical, chemical, and biological activities that take place in the soil. Precipitation moves water through the soil profile, where it dissolves minerals, supports plants and micro-organisms, translocates clay minerals and organic matter, and affects the oxidation-reduction reactions occurring in soil.

During the last glacial advance, the survey area did not look as it does today. The climate was much colder and probably drier. Sea level was about 60 feet below the present-day level, and the bottom of Chesapeake Bay was a very wide, flood plain valley of the Susquehanna River. When the Susquehanna River flooded, silt was deposited on the flood plain and winds lifted and transported the silts to the western edge of the Delmarva Peninsula. The windblown silt, or loess, dominates the western edge of the peninsula *(20)*. Because the climate was dry and cold, the rates of weathering and soil formation were much slower than those today. When the glaciers began to retreat, the climate grew steadily warmer and more humid. Deciduous trees began to take over from the pine forests, and sea level began to rise *(18)*. Initially, sea level rose very quickly. It was not until 4,000 to 5,000 years ago that the rate of sea level rise had slowed enough to allow peat to begin to accumulate in the marshes *(4)*.

Worcester County currently has a humid, temperate climate. The level of rainfall and air temperature are sufficient to cause leaching of plant nutrients from the soil, oxidation of organic matter in the surface layer, and strong weathering of minerals in the soil. This has resulted in soils that are generally low in natural fertility, low in organic matter, and high in acidity. Precipitation has been ample enough to allow the translocation of clay from surface layers to subsurface layers, the leaching of soluble compounds, and the accumulation of organic matter.

Although relatively uniform on a county-wide scale, microvariations in climate can be caused by the slope and aspect of a soil or by its proximity to large bodies of water. A temperature study indicates that soils on the Assateague barrier island averaged about 1 degree F warmer than similar soils on the mainland.

Plants and Animals

The vegetation under which a soil forms influences soil properties such as color, structure, reaction, and the amount and distribution of organic matter. Vegetation recycles nutrients in the soil, removes water, and supplies organic matter to the surface layers. Gases derived from root respiration combine with water to form acids which can influence the movement and weathering rates of minerals.

In Worcester County, the dominant vegetation over the past 15,000 years has changed from evergreen to deciduous. Pollen analyses of soil profiles indicate that vegetation changes closely followed the changing climate *(33)*. According to radiocarbon dating and pollen analyses, by the time of European contact, hardwood forests had replaced the pines and corn was being grown by Native Americans using a slash-and-burn method *(41)*.

The quantity of organic matter in the soil is directly related to the type and distribution of vegetation. In forested areas, residue from trees can make up 4 to 7 percent of the organic matter in the soil. In cultivated areas where only crop residue remains after harvest, organic matter contents are about 1 to 3 percent. In tidal marshes and freshwater swamps along the Pocomoke River, some soils have as much as 30 to 40 percent organic matter. The thickness of some of the organic deposits in the tidal marshes along the mainland is as much as 7 to 8 feet.

Humans also have a significant role in soil formation. The clearing of land for cultivation, alteration of drainage, and addition of farm amendments are examples of how humans change the soil. In addition to changing the soil, humans also "create" new soils through dredging operations and landfill activities. One of the most negative aspects of human influence on soils is accelerated erosion. An erosion study on the Delmarva Peninsula indicates that modern erosion rates are as much as 10 times greater than those before European contact *(11)*.

Parent Material

Parent material is the raw material that is acted on by soil-forming processes. It largely determines soil texture, which affects other properties, such as natural soil drainage and permeability. Parent material influences the physical and chemical composition of the soil.

The soils in Worcester County formed in many different types of parent material. Most of the soils formed in materials which were originally deposited in a marine environment. Other soils may have formed in loess or alluvium. Others may have formed in windblown sands. Some soils formed in organic material that resulted from the slow accumulation of plant residue in marshes, ponds, or riverine environments.

Marine sediment is material that was deposited under water in an estuarine or marine environment. It typically has particles that vary in size from pebbles to clays. Another term for this material is unconsolidated coastal plain sediment. In Worcester County, these sediments are as much as 8,000 feet thick. The particle size of the sediments can indicate the environment in which they were deposited. For example, Matapeake, Nassawango, Mattapex, Othello, and Kentuck soils formed in the Kent Island Formation. This formation is probably a combination of loess and low-energy fluvial deposition of silts and clays. In contrast, Evesboro, Runclint, Klej, Askecksy, and Berryland soils formed in the Parsonburg Sand Formation. This formation is extremely sandy and is characterized geologically as a migrating field of sand dunes. The largest of the geologic formations in the county gave rise to almost all of the upland soil series in Worcester County. The Omar Formation extends the length of the Pocomoke River and is as much as 15 miles wide. The material of this formation is extremely variable in texture. The Omar Formation is believed to have been deposited when the Pocomoke River valley was an ancient back-bay similar to Chincoteague Bay. In these types of environments, the size of particles deposited is related to the speed or current of the water. In higher energy areas, more sandy materials were deposited and Galestown, Fort Mott, Cedartown, Rosedale, Hammonton, Hurlock, and Mullica soils eventually developed. The youngest soils in the county are located on the marine sand deposits of the barrier islands. Acquango, Brockatonorton, Askecksy, and Purnell soils formed in sandy marine deposits. They are being frequently reworked by winds, waves, and overwash events.

Recent alluvium is material deposited by floodwaters along streams and rivers. The texture of the material varies depending on the speed of the floodwater, the duration of flooding, and the distance from the streambank. Soils that formed in recent alluvium can be highly stratified. The soil horizons in these soils are weakly developed because of the interruption of soil formation by depositional events. The source of the alluvium is usually material eroded from other soils farther upstream. Zekiah, Indiantown, Nanticoke, Mannington, and Chicone soils formed in alluvium.

Organic soils formed in decomposed plant materials that accumulated under water. The permanent saturation of the material severely inhibits oxidation of the organic matter and slows down its decomposition. Worcester County has both freshwater and brackish water organic soils. Puckum and Manahawkin soils are dominant along the Pocomoke River. Plant fragments of baldcypress and Atlantic white-cedar are commonly visible in these soils, and organic matter content can be as much as 70 percent, by weight. Along the coast, Transquaking, Boxiron, and Mispillion soils formed in silty material mixed with substantial quantities of saltmarsh cordgrass and saltmeadow cordgrass remains.

Relief

Relief, or topography, is perhaps the most studied soil-forming factor. It can have a significant impact on soil formation and soil properties. The topography of an area can affect depth to a water table, soil temperature, runoff, erosion, and soil depth. Because relief causes differences in natural drainage, different soils can form in the same parent material. A group of soils which are identical except for drainage class is called a catena *(31)*. The Sassafras catena includes Sassafras, Hambrook, Woodstown, and Fallsington soils. The only difference among these soils is the depth to a water table. Otherwise, these soils all have similar characteristics, such as particle size and mineralogy.

The catena concept illustrates how the variation of soils across the landscape is related to topography. For example, the summit of a hill has better drained soils than the toe of the slope. Thus, each different landform within a landscape will give rise to unique soils. Geomorphology is defined as the study of landforms. Research relating soils to the geomorphology of an area indicates that each geomorphic surface can be associated with a specific suite of soils *(8, 38, 39)*. By combining information from soil borings, geology (or parent material), and geomorphology, one can predict which soils will occur on any given landform. For example, there are many streams in the county with flood plains less than 400 feet wide. The sediment deposited during floods is typically sandy. The soils that form should therefore be relatively sandy, have an organic matter content that varies with depth (due to flood episodes), have a natural soil drainage class of poorly drained or very poorly drained, and have a low degree of soil development. The only soils in Worcester County with these attributes are Zekiah and Indiantown soils. Once these soil-landscape relationships are established, they become a very powerful predictive tool. This conceptual model is known as the soil-landscape paradigm *(24, 25)*. It states that similar landforms give rise to similar soils. This model was used in Sinepuxent Bay to map subaqueous soils that support submersed aquatic vegetation *(16)*.

On a smaller scale, relief can also control some specific soil characteristics. Soils on north-facing slopes are slower to warm in spring than the same soils on south-facing slopes. Erosion is more intense on soils on the shoulder or summit of a hill than on the same soils at the toe of the slope. Soil moisture content, which helps to determine vegetation type, is also affected by the soil's position on the slope. In terms of soil formation and morphology, topography may be the most controlling factor on a local basis.

In Worcester County, the topography on the mainland generally consists of broad, nearly level upland flats that are periodically broken by narrow ridges, drainageways, and tidal creeks. Dune-swale topography dominates in the western portion of the county around the Pocomoke State Forest. A steep, 20-foot change in elevation characterizes the sea escarpment which generally runs parallel to the coastline and is about 3 to 6 miles inland. The tidal marshes are broad flats dissected by meandering tidal creeks. The barrier islands are nearly level to steep and bordered by tidal marsh and the Atlantic Ocean. Each of these distinct geomorphic regions has its own suite of commonly occurring soils.

Time

The degree of development of a soil ultimately is controlled by the amount of time that the other soil-forming factors and processes have had to work. If the factors of soil formation have functioned long enough to form well defined, genetically related horizons and a soil is in equilibrium with its environment, the soil is considered mature. Sassafras and Matapeake soils are examples of mature soils. In contrast, immature soils show little or no horizonation within the soil profile. Acquango soils on the barrier island dunes are an example of immature soils. In some soils on flood plains, such as Indiantown soils, the time for development of genetic horizons is dramatically reduced if alluvium is being frequently deposited.

Research on development of genetic horizons has determined the time needed for expression of horizons. Although it is very difficult to design research that can hold four of the five main soil-forming factors constant, sites have been selected which reduced the impact of the factors enough so that time could be considered the only variable. It is estimated that about 5 to 20 years are needed for a soil to develop an A horizon, 300 to 500 years to develop a cambic horizon, and 3,000 to 10,000 years to develop an argillic horizon *(21)*.

The Dot Factor

In Worcester County, the dot factor is of particular importance in the development of subaqueous soils. These soils are permanently saturated by estuarine waters and occur in the coastal bays. Landform expression is affected by tidal currents and wave agitation caused by high winds. For example, the proposed Whittington soils are located on shallow overwash fans behind Assateague Island. As tidal currents ebb and flow, they create a condition in which winnowing of the soil surface becomes important for soil formation. This condition leads to a gradual sorting of the surface soil texture into dominantly fine sand textures.

Another example of tidal current impact is associated with flow rates. In expansive areas, such as the central basin of Sinepuxent Bay, tidal velocities decrease because of the greater extent of area available for flow. In shallow areas, these velocities increase due to the constriction of flow. The the dot factor is thus responsible in part for the expression of underwater landforms and the key to understanding the distribution of their associated subaqueous soils.

Processes of Soil Formation

Soils form through complex processes that can be grouped into four different categories. These differ from the five main soil-forming factors previously discussed in that they are more narrowly defined processes which may or may not occur in all soils. The four processes are additions, losses, transformations, and transfers *(42)*.

The accumulation of organic matter in the A horizon of Indiantown soils is an example of an addition. Organic matter is deposited during occasional floods and through the decomposition of vegetation. Because Indiantown soils are saturated for a large part of the year, very little oxidation of the organic matter takes place. This is the main reason for the black color of the A horizon.

The leaching of iron from the upper horizons of Berryland soils is an example of a removal. A study of these soils in Worcester County indicates that almost all of the iron has been removed from the soil profile *(7)*. The parent material of Berryland soils was initially high in iron, but the iron was removed over time by percolating water.

An example of a transfer is the translocation of clay from the A and E horizons to the B horizons of many upland soils. The A and E horizons are zones of eluviation, or loss. The B horizon is a zone of illuviation, or gain. In Sassafras, Matapeake, Fort Mott, and other soils, the B horizon has more clay than the A and E horizons or the deeper parent material. In the B horizons of some soils, thin clay films are visible in pores or along the surfaces of peds. If clay films occur, the B horizon is considered an argillic horizon because there is evidence that clay has moved downward in the soil profile. This clay has been transferred from the A and E horizons.

The reduction and solubilization of ferrous iron is an example of a transformation. This process takes place under wet, saturated conditions where there is no oxygen. Gleying, or the reduction of iron, is evident in Othello, Fallsington, and Hurlock soils in Worcester County. These soils have dominantly gray B horizons. The gray color is evidence of reduced iron in the profile. Under aerobic conditions, iron oxides, such as goethite, would occur and the soil color would be more yellowish red. Reduced iron is soluble in water and can move within the soil. Sometimes the iron moves only a short distance before it is reoxidized and accumulates as reddish concretions, stains, or mottles. Some of the reduced iron may be completely lost from one horizon and occur in a deeper underlying horizon. The patterns of mottling are a result of different modes of iron movement in the soil *(19)*.

Morphology of the Soils

The result of the interaction of the soil-forming factors and the processes of soil formation can be distinguished by the different layers, or horizons, in the soil profile. The soil profile extends from the surface downward to material that has undergone little, if any, weathering *(49)*.

Most mature soils have at least three horizons—the A, B, and C horizons. Some soils also have an E horizon or transitional horizons which have the attributes of both the horizon above and the horizon below. Subscripts and lowercase letters are used to indicate subdivisions of the major horizons, which mark changes within a horizon. For example, a B horizon containing illuvial clay is labelled a Bt horizon. If within the Bt horizon there is a change in color, the horizon can be split into Bt1 and Bt2 horizons. If there is a change in parent material within the Bt horizon, a number is placed in front of the horizon symbol, such as Bt1 and 2Bt2. The notation 2Bt2 indicates a horizon that is the second layer within the Bt horizon and that formed in a second parent material.

The A horizon is the surface layer of the soil. It is the horizon that typically has the largest amount of organic matter accumulation and the greatest loss of clay and iron. In well drained upland soils, such as Sassafras and Matapeake soils, the A horizon is generally 4 to 8 inches thick and is dark yellowish brown. Mullica soils, which developed under saturated conditions, have an A horizon that is 10 to 20 inches thick and typically black. The darker color and greater thickness result from the predominance of anaerobic conditions, which slow the break down of organic matter.

Directly below the A horizon is the subsurface layer known as the E horizon. In cultivated areas the E horizon may have been destroyed by plowing. The E horizon is an eluvial horizon that has lost significant amounts of clay and iron, but it does not have enough organic matter to stain it dark like the A horizon. The E horizon of soils in Worcester County, such as Fort Mott soils, is lighter in color than both the A and B horizons. Some soil profiles may have a transitional horizon, such as a BE horizon, which has some characteristics of both the E and B horizons.

The subsoil layer shows the maximum accumulation (or illuviation) of iron, clay, and other compounds and is known as the B horizon. In most well drained soils, such as Sassafras and Matapeake soils, the B horizons are generally firmer, have a finer texture, and have a redder color than other soil horizons. The redder colors are due to the accumulation of iron oxides. The presence of a well developed B horizon indicates that soil formation has been progressing for hundreds, if not thousands, of years. In wet soils, such as Fallsington soils, the B horizon may not have any accumulation of iron, but it still shows the maximum accumulation of clay. In this case the iron oxides have been reduced.

The least altered layer in the soil is called the C horizon. It is normally below the A, E, and B horizons. The processes of soil formation have had little, if any, impact on the parent material. Very young soils, such as Zekiah soils, have only a thin A horizon overlying a C horizon (which may be subdivided into C1 and C2 horizons, etc.). In more developed soils, such as Fort Mott soils, the C horizon occurs much deeper in the soil profile, below the A, E, and Bt horizons.

General Soil Map Units

The general soil map 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 a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Askecksy-Klej-Runclint

Nearly level to moderately sloping, poorly drained to well drained soils that formed in sandy materials

This map unit is in the northwestern part of the county, dominantly at elevations of more than 40 feet. It is on broad areas of undulating topography where elevations may change as much as 20 feet on the dunal landscape. A few very steep areas occur along streams, but the majority of the acreage has slopes of less than 5 percent. Slopes range from 0 to 15 percent.

This map unit makes up about 10 percent of the county. It is about 25 percent Askecksy soils, 25 percent Klej soils, and 10 percent Runclint soils. Minor soils make up the remaining acreage and include Fallsington and Hurlock soils on low-lying uplands; Woodstown, Hammonton, Galestown, and Evesboro soils on uplands; and Zekiah soils on flood plains.

The nearly level, poorly drained Askecksy soils are on broad, low-lying flats. They have a subsoil of loamy sand or sand.

The nearly level or gently sloping, moderately well drained Klej soils are on side slopes of dunes, small knolls, and uplands. They have a subsoil of loamy sand.

The nearly level or gently sloping, well drained Runclint soils are on uplands and small ridges. They have a subsoil of loamy sand and a water table below a depth of 48 inches.

Some of this map unit is suitable for farming, but most areas are currently woodland.

2. Fallsington-Hammonton-Rosedale

Nearly level and gently sloping, poorly drained to well drained soils that formed in loamy materials

This map unit is in the south-central and northwestern parts of the county, dominantly at elevations between 25 and 45 feet. It is on broad, low-lying uplands dissected by numerous streams. A few steep areas occur along streams, but the majority of the acreage has slopes of less than 2 percent. Slopes range from 0 to 10 percent.

This map unit makes up about 7 percent of the county. It is about 30 percent Fallsington soils, 30 percent Hammonton soils, and 15 percent Rosedale soils. Minor soils make up the remaining acreage and include Hurlock and Askecksy soils on low-lying uplands; Woodstown, Klej, Galestown, and Evesboro soils on uplands; and Zekiah soils on flood plains.

The nearly level, poorly drained Fallsington soils are on broad, low-lying flats. They have a subsoil of loam or sandy clay loam.

The nearly level or gently sloping, moderately well drained Hammonton soils are on small knolls and uplands. They have a subsoil of sandy loam.

The nearly level or gently sloping, well drained Rosedale soils are on uplands and small ridges. They have a loam subsoil and a water table below a depth of 48 inches.

Almost all of this map unit is suitable for farming, but most areas are currently woodland.

3. Hurlock-Hambrook-Sassafras

Nearly level and gently sloping, poorly drained to well drained soils that formed in loamy materials

This map unit is in the Pocomoke River basin and extends the length of the county along the eastern margin of the mainland. It occurs dominantly at elevations below 30 feet. It is on highly dissected uplands adjacent to major streams and the old sea escarpment. A few steep areas occur along streams and the escarpment, but the majority of the acreage has slopes of less than 5 percent. Slopes range from 0 to 10 percent.

This map unit makes up about 31 percent of the county. It is about 25 percent Hurlock soils, 20 percent Hambrook soils, and 20 percent Sassafras soils. Minor soils make up the remaining acreage and include Mullica, Berryland, Hurlock, and Askecksy soils on low-lying uplands and Woodstown, Klej, Mattapex, Nassawango, Galestown, and Evesboro soils on uplands.

The nearly level, poorly drained Hurlock soils are on broad, low-lying flats. They have a subsoil of sandy loam or loam.

The nearly level or gently sloping, well drained Hambrook soils are on small knolls and uplands. They have a subsoil of sandy clay loam or loam and a water table below a depth of 48 inches.

The nearly level or gently sloping, well drained Sassafras soils are on broad uplands and small ridges. They have a loam subsoil.

Almost all of this map unit is suitable for farming, but most areas are currently woodland.

4. Mullica-Berryland

Nearly level and gently sloping, very poorly drained to moderately well drained soils that formed in very acid sandy materials

This map unit is in the northeastern part of the county, dominantly at elevations between 10 and 45 feet. It is on broad lowlands occasionally dissected by streams. The majority of the acreage has slopes of less than 2 percent. Slopes range from 0 to 5 percent.

This map unit makes up about 5 percent of the county. It is about 30 percent Mullica soils and 30 percent Berryland soils. Minor soils make up the remaining acreage and include Hurlock and Askecksy soils on low-lying uplands and Hammonton, Klej, and Evesboro soils on uplands.

The nearly level, very poorly drained Mullica soils are on broad, low-lying flats. They have a subsoil of sandy loam.

The nearly level, very poorly drained Berryland soils are dominantly interspersed with the Mullica soils. They have a subsoil of loamy sand or sand.

Almost all of this map unit is suitable for farming, but most areas are currently woodland.

5. Nassawango-Mattapex-Matapeake

Nearly level and gently sloping, well drained and moderately well drained soils that formed in silty materials

This map unit occurs primarily around the town of Newark in the central part of the county and along the northwest side of the Pocomoke River near Snow Hill and Porters Crossing. It is on broad uplands and interfluves. Slopes range from 0 to 5 percent.

This map unit makes up about 5 percent of the county. It is about 30 percent Nassawango soils, 30 percent Mattapex soils, and 30 percent Matapeake soils. Minor soils make up the remaining acreage and include Sassafras, Hambrook, Fort Mott, and Evesboro soils on uplands and ridges and Othello and Kentuck soils in depressions and low-lying areas.

The nearly level or gently sloping Nassawango soils are on uplands. They have a subsoil of silt loam and a water table below a depth of 48 inches.

The nearly level or gently sloping, moderately well drained Mattapex soils are on uplands and in shallow swales. They have a subsoil of silt loam.

The nearly level or gently sloping, well drained Matapeake soils are on uplands. They have a subsoil of silt loam.

The acreage of this map unit is almost entirely cultivated. All the soils in the unit are well suited to corn, soybeans, and truck crops. These soils have the best water-holding capacity of the soils in Worcester County and need little special management for crop production. They also have few limitations affecting woodland management and are suitable for nonagricultural uses.

6. Othello-Kentuck

Nearly level and gently sloping, poorly drained soils that formed in silty materials

This map unit is in the central and southwestern parts of the county, dominantly at elevations between 15 and 45 feet. It is on broad lowlands dissected by numerous streams. A few steep areas occur along streams, but the majority of the acreage has slopes of less than 2 percent. Slopes range from 0 to 5 percent.

This map unit makes up about 22 percent of the county. It is about 50 percent Othello soils and 15 percent Kentuck soils. Minor soils make up the remaining acreage and include Mattapex, Nassawango, Elkton, and Hambrook soils on small interfluves and upland knolls.

The nearly level, poorly drained Othello soils are on broad, low-lying flats. They have a subsoil of silt loam or silty clay loam.

The nearly level, very poorly drained Kentuck soils are in small depressions. They have a subsoil of silt loam.

Almost all of this map unit is suitable for farming, but most areas are currently woodland.

7. Puckum-Manahawkin-Indiantown

Nearly level, very poorly drained soils that formed in organic and sandy alluvial materials

This map unit occurs along flood plains of rivers and streams throughout the county. Slopes are commonly less than 1 percent but can range to 3 percent.

This map unit makes up about 8 percent of the county. It is about 34 percent Puckum soils, 28 percent Manahawkin soils, and 18 percent Indiantown soils. Minor soils make up the remaining acreage and include Zekiah soils in narrow flood plain areas and Mannington and Nanticoke soils on mud flats adjacent to the Pocomoke River and Nassawango Creek.

The nearly level Puckum soils are on very broad flood plains. They have organic materials throughout the profile.

The nearly level Manahawkin soils are on broad flood plains. They have sandy materials underlying organic materials.

The nearly level Indiantown soils are on thin flood plains. They have a sandy subsoil.

All of the acreage of this map unit is currently woodland.

8. Brockatonorton-Acquango

Nearly level to moderately sloping, moderately well drained and well drained soils that formed in windblown sandy materials

This map unit occurs on the barrier islands along the Atlantic Ocean. Slopes are generally less than 3 percent except along dunes, where slopes can be as much as 15 to 20 percent.

This map unit makes up about 1 percent of the county. It is about 50 percent Brockatonorton soils and 25 percent Acquango soils. Minor soils make up the remaining acreage and include Askecksy and Purnell soils in low-lying areas behind the dunes and coastal beaches along the water-land interface.

The nearly level or gently sloping Brockatonorton soils are in back-dune areas. They have a mixed sandy and organic subsoil.

The gently sloping to moderately sloping Acquango soils are on dunes. They have a sandy subsoil.

All of the acreage of this map unit currently supports salt-tolerant vegetation or is used as beach recreational areas.

9. Transquaking-Purnell-Boxiron

Nearly level, very poorly drained soils that formed in organic and silty estuarine materials

This map unit occurs in all the saltwater tidal marshes in the county. Slopes are commonly less than 1 percent.

This map unit makes up about 6 percent of the county. It is about 20 percent Transquaking soils, 18 percent Purnell soils, and 13 percent Boxiron soils. Minor soils make up the remaining acreage and include Mispillion and Broadkill soils and Sunken, Askecksy, Acquango, Brockatonorton, Runclint, and Evesboro soils in isolated, elevated areas within the marshes.

The nearly level Transquaking soils have an organic subsoil.

The nearly level Purnell soils have a sandy subsoil.

The nearly level Boxiron soils have a silty subsoil.

All of the acreage of this map unit currently supports salt-tolerant vegetation.

10. Urban land

Nearly level, impervious manmade materials

This map unit occurs on Fenwick Island. Slopes are generally less than 3 percent except along the beach.

This map unit makes up about 1 percent of the county. It is about 60 percent Urban land. Minor soils make up the remaining acreage and include Askecksy soils and Udorthents.

Nearly all of the acreage of this map unit is used for commercial or residential purposes.

11. Water

This map unit occurs in open water areas of the county, including Assawoman, Sinepuxent, and Chincoteague Bays and the Pocomoke and St. Martins Rivers.

This map unit makes up about 19 percent of the county. Included in this unit along the margins are areas of subaqueous soils occurring in vegetated, shallow water habitats.

All of the acreage of this map unit is suitable for salt-tolerant, submersed aquatic vegetation and as habitat for benthic organisms, such as clams, scallops, and oysters.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(47, 50)*. 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 from laboratory data. Table 4 shows the classification of the soils in Worcester County. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil development. Each order is identified by a word ending in *sol.* In Worcester County, six soil orders are recognized, including Alfisols, Entisols, Inceptisols, Histosols, Spodosols, and Ultisols. Entisols and Inceptisols are relatively young soils characterized by weakly developed soil horizons. The dominant soil-forming process in these soils is the addition of organic matter and development of a darker surface horizon. In contrast, Alfisols, Histosols, Spodosols, and Ultisols are more strongly developed soils showing evidence of clay accumulation in the subsoil, accumulation of thick organic surface horizons, removal of iron through leaching, and development of soil structure.

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. For example, an important property of Entisols that affects plant growth is water supply. The suborder Psamment indicates a sandy, droughty soil, and Aquent indicates a weakly developed soil with a seasonal high water table. The first part of the name denotes the suborder, and the last syllable in the name indicates the order. An example is Aquent (*Aqu*, indicating an aquic moisture regime and meaning wet, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture regimes; type of saturation; *n* value (fluidity); mineralogy; and organic matter accumulation or distribution. Each great group is identified by the name of a suborder and by a prefix that indicates a significant property of the soil. For example, all Aquents are weakly developed soils with high water tables, but Sulfaquents have sulfides at or near the surface. An example of a great group is Fluvaquents (*Fluv*, having an organic matter content that changes with increasing depth, plus *aquent*, the suborder of Entisols that has an aquic 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. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. Intergrades are transitions to other orders, suborders, or great groups due to overlaps or slight differences in the dominant pedogenic processes. Extragrades have some properties that are not representative of the great group but do not result from pedogenic processes. For example, Fluvaquentic Humaquepts are an intergrade representing soils that are Humaquepts but have pedogenic processes and soil characteristics very similar to those of Fluvaquents. Histic Sulfaquents are also an intergrade. *Histic* indicates that the soils differ from the Typic subgroup soils in having an organic surface horizon but that this horizon is not thick enough for the soils to be classified in the Histosol order. An example of an extragrade is Cumulic Humaquepts. *Cumulic* indicates that the surface horizon is thicker than normal for this subgroup, but the thickness is a result of the same pedogenic processes responsible for the expression of Humaquepts. Thapto-Histic Fluvaquents are also an extragrade. *Thapto-Histic* indicates that there are buried Histosols underneath the Fluvaquents but that this does not affect the classification.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Among the properties and characteristics considered are particle size, mineralogy, temperature regime, reaction, and coatings. Generally, the properties are those of horizons below the main zone of biological activity. For example, temperature regime family is based on the mean annual soil temperature at a depth of about 10 inches. Particle size family is commonly based on horizons occurring between depths of 10 and 40 inches. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, mesic, nonacid Thapto-Histic Fluvaquents. These soils have more than 50 percent silt and less than 18 percent clay (coarse-silty), no single dominant mineral (mixed), an annual soil temperature between 42 and 58 degrees F (mesic), and an alkaline pH (nonacid) and have a buried organic surface layer below a wet, weakly developed flood plain soil.

The results of a soil temperature study in Worcester County are shown in table 5. Soil temperatures were recorded monthly over a 4-year period at a depth of 20 centimeters. This study was performed to determine the soil temperature regime for classification at family level.

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. An example of two different series that classify in the same family are Sassafras and Hambrook soils. In Worcester County, both series classify as fine-loamy, mixed, mesic Typic Hapludults. They are separate series because they have a number of properties which differ significantly. Hambrook soils have a grayish fine-textured horizon deep in the soil profile that can hold water during winter. Sassafras soils are identical to Hambrook soils except that they do not have this horizon.

Soil Series and Detailed Soil Map Units

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

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" *(49)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(47)* and in "Keys to Soil Taxonomy" *(50)*. 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 delineated on the detailed maps 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, Sassafras sandy loam, 2 to 5 percent slopes, is a phase of the Sassafras series in Worcester County.

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. Cedartown-Rosedale complex, 0 to 2 percent slopes, is an example of a complex in Worcester County.

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. Boxiron and Broadkill soils is an undifferentiated group in Worcester County.

This survey includes *miscellaneous areas*. Such areas have little or no soil development and support little or no vegetation. Beaches is an example of a miscellaneous area in Worcester County.

Table 6 gives the acreage and proportionate extent of each map unit. Other tables (see "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Acquango Series

The soils of the Acquango series are very deep and excessively drained. Permeability is rapid or very rapid. These soils formed in sandy aeolian and marine sediments. They are located in backshore and dunal areas of barrier islands along the mid-Atlantic Coast. Slopes range from 0 to 30 percent.

Acquango soils are similar to Evesboro soils and are commonly adjacent to Brockatonorton soils and Beaches. The Acquango soils differ from Brockatonorton soils in not having redoximorphic features in the subsoil. They differ from Evesboro soils in having more weatherable minerals and being very slightly saline or slightly saline in the surface and subsurface horizons.

Typical pedon of Acquango sand, 5 to 10 percent slopes; on an 8 percent slope, on a barrier island dune, approximately 3 miles south of the Assateague Island entrance on Park Road, 500 feet east of the road on a vegetated dune:

A—0 to 3 inches; light gray (2.5Y 7/2) sand; single grain; loose; few very fine and fine roots; very slightly saline; slightly acid; clear wavy boundary.

C1—3 to 20 inches; pale yellow (5Y 7/3) sand; single grain; loose; common $^{1}/_{32}$- to $^{1}/_{16}$-inch striations of black (N 2/0) sand; very slightly saline; slightly acid; abrupt wavy boundary.

C2—20 to 26 inches; black (10YR 2/1) sand; single grain; loose; nonsaline; slightly acid; abrupt wavy boundary.

C3—26 to 80 inches; very pale brown (10YR 7/3) sand; single grain; loose; nonsaline; neutral.

The thickness of the A and C horizons is greater than 72 inches. Reaction ranges from slightly acid to slightly alkaline. The electrical conductivity of the saturation extract is less than 6 millimhos per centimeter. Salinity is typically less than 3 parts per thousand. The content of shell fragments ranges from 0 to 20 percent throughout the profile. The shell fragments may be so finely ground that visual identification is difficult.

The A horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 4. It is sand, coarse sand, or fine sand.

The C horizon has hue of 10YR to 5Y, value of 2 to 8, and chroma of 1 to 6. It is sand, coarse sand, or fine sand.

AcB—Acquango sand, 2 to 5 percent slopes

Composition

Acquango soil and similar soils: 90 percent
Inclusions: 10 percent

Setting

Landform: Dunes
Slope: 2 to 5 percent
Note: All of the acreage of this map unit occurs on the barrier islands. Dominant vegetation is American beachgrass, panicgrass, and other salt-tolerant plants. On Fenwick Island this unit is a critical component of storm and overwash protection measures. Efforts should be made to maintain and/or enhance the vegetation. Due to the soil's inherent low fertility and droughtiness, replanted and existing vegetation should be properly

fertilized and protected as per recommendations by the Natural Resources Conservation Service. Vegetated areas provide excellent habitat for coastal wildlife.

Component Description

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian and marine sediments
Flooding: Occasional
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: Some dune areas of this map unit have been restored using earthmoving equipment and/or other alternative means, such as sand fences and hay bales. The soil is subject to severe scouring and erosion due to intense wave action during winter "northeasters" and tropical storms in summer and fall. Salinity ranges from 0 to 4 parts per thousand.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Brockatonorton soils in depressional areas and in the slightly lower landform positions
• Purnell soils along the edge of small rises in tidal marshes

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

AcC—Acquango sand, 5 to 10 percent slopes

Composition

Acquango soil and similar soils: 90 percent
Inclusions: 10 percent

Setting

Landform: Dunes
Slope: 5 to 10 percent
Note: All of the acreage of this map unit occurs on the barrier islands. Dominant vegetation is American beachgrass, panicgrass, and other salt-tolerant plants. On Fenwick Island this unit is a critical component of the hurricane protection project. Efforts should be made to maintain and/or enhance the vegetation. Due to the soil's inherent low fertility and droughtiness, replanted and existing vegetation should be properly fertilized and protected as per recommendations by the Natural Resources Conservation Service. Vegetated areas provide excellent habitat for coastal wildlife.

Component Description

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian and marine sediments
Flooding: Occasional
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: Slopes dominantly range from 5 to 10 percent but may be steeper in wind- or water-scoured areas. Some dune areas of this map unit have been restored using earthmoving equipment and/or other alternative means, such as sand fences and hay bales. The soil is subject to severe scouring and erosion due to intense wave action during winter "northeasters" and tropical storms in summer and fall. Salinity ranges from 0 to 4 parts per thousand.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Brockatonorton soils at the backshore toe of the dunes
• Coastal beaches along the foreshore toe of the dunes

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Askecksy Series

The soils of the Askecksy series are very deep and poorly drained. Permeability is rapid or very rapid. These soils formed in sandy fluviomarine sediments. They are on low-lying uplands, in broad depressions, and in backshore areas of barrier islands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Askecksy soils are similar to Mullica soils. Generally, they commonly are adjacent to Berryland, Klej, Mullica, and Runclint soils. On the barrier islands, they are commonly adjacent to Acquango, Brockatonorton, and Purnell soils. The Askecksy soils differ from Acquango, Brockatonorton, Klej, and Runclint soils in having a matrix with low chroma or having depletions in the surface and subsurface horizons. They differ from Berryland and Mullica soils in not having a black surface horizon more than 10 inches thick. They differ from Purnell soils in not having an organic surface layer.

Typical pedon of Askecksy loamy sand; about 2.0 miles south of the tri-county border on County Line Road, 100 feet east in a cultivated field:

Ap—0 to 10 inches; very dark gray (10YR 3/2) loamy sand; weak fine subangular blocky structure; very friable; common very fine and fine roots; moderately acid; clear smooth boundary.

Cg1—10 to 24 inches; grayish brown (10YR 6/2) loamy sand; weak fine subangular blocky structure; very friable; few very fine and fine roots; many medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; moderately acid; clear wavy boundary.

Cg2—24 to 30 inches; light gray (10YR 7/1) loamy sand; weak fine subangular blocky structure; very friable; few very fine and fine roots; strongly acid; clear wavy boundary.

Cg3—30 to 38 inches; gray (5Y 6/1) sand; single grain; loose; very strongly acid; gradual wavy boundary.

Cg4—38 to 54 inches; gray (5Y 6/1) loamy sand; massive; very friable; common medium faint pale brown (10YR 6/3) and few fine distinct light olive brown (2.5Y 5/6) soft masses of iron accumulation; extremely acid; gradual wavy boundary.

Cg5—54 to 72 inches; gray (10YR 5/1) stratified sand and loamy sand; single grain; loose; few medium prominent black (N 4/0) stains; extremely acid.

The thickness of the A and C horizons is greater than 72 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. On the barrier islands, the electrical conductivity is less than 12 millimhos per centimeter. Salinity is typically less than 10 parts per thousand. These soils are occasionally flooded by storm tides.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is loamy sand or sand.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2. It is loamy sand or sand.

The Bw horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is sand or loamy sand.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

As—Askecksy loamy sand

Composition

Askecksy soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit on the mainland is woodland, and the remainder is cropland. On the barrier islands, this unit is affected by salt spray and is occasionally flooded by high tides of brackish water during storm events. Due to the soil's higher salinity levels, the vegetation may consist entirely of salt-tolerant plants.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Poorly drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Salinity ranges from 0 to 4 parts per thousand on the barrier islands.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Klej soils on small rises in the slightly higher landform positions on the mainland, and Brockatonorton soils on the barrier islands
• Mullica and Berryland soils in the slightly lower

landform positions on the mainland, and Purnell soils on the barrier islands

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Be—Beaches

Composition

Beaches: 100 percent

Setting

Landform: Barrier beaches
Slope: 0 to 10 percent
Note: Most of the acreage of this map unit is on the eastern edge of the barrier islands. These areas are frequently utilized by horseshoe crabs, sand fiddler crabs, mole crabs, and numerous shore birds. This unit supports little or no vegetation. The areas are covered by water during high tides and storm events. Some small, thin areas of the map unit occur along the mainland.

Component Description

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Sandy estuarine sediments and/or marine sediments
Flooding: Frequent
Kind of water table: Apparent
Salt affected: Saline within a depth of 30 inches
Available water capacity: Very low
Note: Salinity is commonly greater than 20 parts per thousand. Finely ground shells occur within the soil profile. Larger, completely intact or partially broken shells are common on the surface. Areas of this map unit are subject to frequent wave action, and erosion may drastically alter the width of the unit.

Inclusions

- Acquango soils on adjacent dunes

Berryland Series

The soils of the Berryland series are very deep and very poorly drained. Permeability is rapid. These soils formed in highly acidic sandy fluviomarine sediments. They are on low-lying flats and in broad depressions of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Berryland soils are similar to Mullica soils and commonly are adjacent to Askecksy, Klej, Mullica, and Runclint soils. The Berryland soils differ from Askesky, Klej, and Runclint soils in having a black surface layer more than 10 inches thick. They differ from Mullica soils in having a subsurface horizon of humus accumulation that may exhibit cementation or ironstone.

Typical pedon of Berryland mucky loamy sand; about 0.8 mile east of Route 113 on Morris Road, approximately 200 feet north in a cultivated field:

A—0 to 14 inches; black (10YR 2/1) mucky loamy sand; weak fine granular structure; very friable; common very fine and fine roots; moderately acid; abrupt smooth boundary.

AE—14 to 17 inches; very dark gray (10YR 3/1) loamy sand; weak medium subangular blocky structure; very friable; few very fine and fine roots; moderately acid; clear wavy boundary.

Bh—17 to 24 inches; dark brown (7.5YR 3/2) loamy sand; massive; very friable; few very fine and fine roots; few medium firm strong brown (7.5YR 4/6) cemented nodules; strongly acid; clear wavy boundary.

BC—24 to 35 inches; dark gray (10YR 4/1) sand; single grain; loose; very strongly acid; clear wavy boundary.

C—35 to 44 inches; brownish yellow (10YR 6/6) sand; common medium distinct light brownish gray (10YR 6/2) irregularly shaped iron depletions; single grain; loose; very strongly acid; clear wavy boundary.

Cg—44 to 72 inches; gray (10YR 5/1) stratified sand and loamy sand; single grain; loose; extremely acid.

The thickness of the solum ranges from 28 to 40 inches. Depth to the Bh horizon is generally 10 to 18 inches. In cultivated areas, many pedons do not have an E horizon. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. In most pedons the Bh horizon has some cementation, but to varying degrees.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is mucky loamy sand, loamy sand, or sand.

The AE or E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2. It is mucky loamy sand, loamy sand, or sand.

The Bh horizon has hue of 5YR to 10YR and value and chroma of 2 to 4. It is loamy sand or sand.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 6. It is loamy sand or sand.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

Bh—Berryland mucky loamy sand

Composition

Berryland soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. The map unit occurs mostly in the northern part of the county along the Delaware State line and in the Pocomoke State Forest area.

Component Description

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: Rare
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: Low
Note: Some areas of this unit may remain ponded for extended periods. Cementation in the subsurface horizons occurs in some noncultivated areas.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mullica soils in landform positions similar to those of the Berryland soil
- Klej soils on small rises in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Boxiron Series

The soils of the Boxiron series are very deep and very poorly drained. Permeability is moderately slow. These soils formed in thin, moderately decomposed organic deposits derived from salt-tolerant vegetation overlying silty marine and estuarine sediments. They are flooded twice daily by brackish tidal waters and are located in estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Boxiron soils are similar to Broadkill soils and are commonly adjacent to Broadkill, Mispillion, Sunken, and Transquaking soils. The Boxiron soils differ from Broadkill soils in having an organic surface horizon more than 8 inches thick. They differ from Mispillion and Transquaking soils in having an organic surface horizon less than 16 inches thick. They differ from Sunken soils in having moderate or high *n* values in the mineral horizons.

Typical pedon of Boxiron peat in an area of Boxiron and Broadkill soils; on a smooth 0 percent slope, 2 miles southeast of Pawpaw Road on Scotts Landing Road, 200 feet north of Rattlesnake Landing, in a tidal marsh:

Oi—0 to 7 inches; dark brown (7.5YR 3/3) peat, fibric soil material; fiber content is four-fifths the soil volume after rubbing; 40 percent mineral soil material; many very fine and fine and common medium and coarse live roots; strongly saline; moderately alkaline; abrupt smooth boundary.

Oe—7 to 13 inches; very dark grayish brown (2.5Y 3/2) mucky peat, hemic soil material; fiber content is one third the soil volume after rubbing; 50 percent mineral soil material; many very fine and fine and few medium and coarse live roots; strongly saline; moderately alkaline; abrupt smooth boundary.

Cg1—13 to 30 inches; dark gray (2.5Y 4/1) silt loam; massive; friable, slightly sticky; common very fine and fine roots; 15 percent light olive brown (2.5Y 5/6) organic fragments; *n* value greater than 1.0, material flows easily between the fingers when squeezed; strongly saline; moderately alkaline; gradual wavy boundary.

Cg2—30 to 71 inches; dark greenish gray (5GY 4/1) silt loam; massive; friable, slightly sticky; *n* value greater than 1.0, material flows easily between the fingers when squeezed; common medium faint gray (2.5Y 5/1) iron depletions; moderately saline; slightly alkaline; abrupt smooth boundary.

2Cg3—71 to 80 inches; gray (5Y 5/1) sand; single grain; loose; 6 percent shell fragments; moderately saline; neutral.

The thickness of the organic surface horizons ranges from 8 to 16 inches. The *n* value of the mineral horizons is generally greater than 0.8 and commonly greater than 1.0. Reaction ranges from neutral to moderately alkaline. The electrical conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity is typically greater than 22 parts per thousand. If dredged, these soils have a high potential to undergo acid-sulfate weathering, which results in a soil pH of less than 4.0.

The O horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is peat or mucky peat. The fiber content is greater than one-sixth of the soil volume after rubbing. Mineral content ranges from 20 to 70 percent.

The Cg horizon has hue of 10YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is silt loam, mucky silt loam, or silty clay loam. The *n* value generally is greater than 0.8 and commonly is greater than 1.0. In some pedons there are thin subhorizons (less than 3 inches thick) of organic material.

The 2Cg horizon, if it occurs, has hue of 10YR to 5GY, value of 3 to 7, and chroma of 0 to 2. It is loamy sand or sand. The shell content ranges from 0 to 15 percent.

Broadkill Series

The soils of the Broadkill series are very deep and very poorly drained. Permeability is moderate. These soils formed in silty marine and estuarine sediments and are flooded twice daily by brackish tidal waters. They are located in estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Broadkill soils are similar to Boxiron soils and are commonly adjacent to Boxiron, Mispillion, Sunken, and Transquaking soils. The Broadkill soils differ from Boxiron, Mispillion, and Transquaking soils in not having an organic surface horizon more than 8 inches thick. They differ from Sunken soils in having moderate or high *n* values in the mineral horizons.

Typical pedon of Broadkill mucky peat in an area of Boxiron and Broadkill soils; on a smooth 0 percent slope, at George Island Landing, 100 feet south of the parking area in Knox Marsh:

Oe—0 to 4 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; fiber content is one-third the soil volume after rubbing; 75 percent mineral soil material; many very fine and fine and common medium and coarse live roots; strongly saline; moderately alkaline; abrupt smooth boundary.

Ag—4 to 20 inches; dark gray (5Y 4/1) silt loam; massive; friable, slightly sticky; many fine strong brown (7.5YR 4/6) organic fibers; 20 percent light olive brown (2.5Y 5/3) organic fragments; common fine live roots; *n* value greater than 1.0, material flows easily between the fingers when squeezed; strongly saline; moderately alkaline; clear wavy boundary.

Cg—20 to 80 inches; very dark gray (5Y 3/1) silt loam; massive; friable, slightly sticky; 15 percent light olive brown (2.5Y 5/3) organic fragments; *n* value greater than 1.0, material flows easily between the fingers when squeezed; slightly saline; slightly alkaline.

The thickness of the organic surface horizon is less than 7 inches. The *n* value of the mineral horizons is generally greater than 0.8 and commonly greater than 1.0. The electrical conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity typically is greater than 22 parts per thousand. Reaction ranges from neutral to moderately alkaline. If dredged, these soils have a high potential to undergo acid-sulfate weathering, which results in a soil pH of less than 4.0.

The O horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is mucky peat or peat. The fiber content after rubbing is greater than one-sixth of the soil volume.

The Ag horizon has hue of 10YR to 5GY, value of 3 or 4, and chroma of 0 to 2. It is silt loam, mucky silt loam, or silty clay loam. The *n* value is generally greater than 0.8 and commonly greater than 1.0. In some pedons there are thin subhorizons (less than 3 inches thick) of organic material.

The Cg horizon has hue of 10YR to 5GY, value of 3 to 7, and chroma of 0 to 2. It is silt loam or silty clay loam. The *n* value is greater than 0.8.

Br—Broadkill mucky silt loam

Composition

Broadkill soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is in areas of Assawoman Bay and southern Chincoteague Bay. The dominant vegetation is saltmeadow cordgrass, saltmarsh cordgrass, saltgrass, sea lavender, and saltwort. These areas provide excellent habitat for tidal wetland wildlife, including

habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Mucky silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty estuarine sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: High
Note: The erosion potential is highest along the edge of the marsh. If dredged, the soil has a high potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

• Boxiron, Mispillion, and Transquaking soils in landform positions similar to those of the Broadkill soil

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

BX—Boxiron and Broadkill soils

Composition

Boxiron soil and similar soils: 40 percent
Broadkill soil and similar soils: 40 percent
Inclusions: 20 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 1 percent
Note: Most of the acreage of this map unit is in areas of Assawoman Bay and southern Chincoteague Bay. The dominant vegetation is saltmeadow cordgrass, saltmarsh cordgrass, saltgrass, sea lavender, and saltwort. These areas provide excellent habitat for tidal wetland wildlife, including habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds. The soils are a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Boxiron

Surface layer texture: Peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic deposits over silty estuarine sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: Very high
Note: The erosion potential is highest along the edge of the marsh. If dredged, this soil has a high potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less. Salinity is commonly greater than 20 parts per thousand.

Broadkill

Surface layer texture: Mucky peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty estuarine sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: High
Note: The erosion potential is highest along the edge of the marsh. If dredged, this soil has a high potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less. Salinity is commonly greater than 20 parts per thousand.

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

• Mispillion and Transquaking soils in landform positions similar to those of the Boxiron and Broadkill soils

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

Brockatonorton Series

The soils of the Brockatonorton series are very deep and moderately well drained. Permeability is rapid or very rapid. These soils formed in sandy aeolian and marine sediments overlying sandy organic deposits. They are located in backdune areas of barrier islands along the mid-Atlantic Coast. Slopes range from 0 to 5 percent.

Brockatonorton soils are similar to Klej soils and are commonly adjacent to Acquango, Askecksy, and Purnell soils. The Brockatonorton soils differ from Acquango soils in having redoximorphic features in the subsoil. They differ from Klej soils in having more weatherable minerals and a buried organic horizon and in being very slightly saline or slightly saline in the surface and subsurface horizons. They differ from Askecksy soils in not having redoximorphic features in the surface and subsurface horizons. They differ from Purnell soils in not having an organic surface horizon more than 8 inches thick.

Typical pedon of Brockatonorton sand, 0 to 2 percent slopes; on an undulating 1 percent slope, behind a barrier island dune, approximately 2 miles south of the Assateague Island entrance on Park Road, 50 feet east of the road, on a vegetated backdune:

A—0 to 3 inches; light gray (2.5Y 7/2) sand; single grain; loose; few fine and very fine roots; nonsaline; moderately acid; clear wavy boundary.

C—3 to 24 inches; pale yellow (5Y 7/3) sand; single grain; loose; few 1/32- to 1/16-inch striations of black (N 2/0) sand; very slightly saline; slightly acid; abrupt wavy boundary.

Cg—24 to 50 inches; gray (5Y 6/1) sand; single grain; loose; 5 percent shell fragments; very slightly saline; slightly acid; abrupt smooth boundary.

Oe—50 to 60 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; fiber content is one-fourth the soil volume after rubbing; common medium gray (5Y 5/1) lenses of sand; 10 percent strong brown (7.5YR 4/6) soft wood fragments; slightly saline; neutral; abrupt wavy boundary.

C′g—60 to 80 inches; gray (5Y 5/1) sand; single grain; loose; 5 percent strong brown (7.5YR 4/6) organic fibers; 8 percent shell fragments; very slightly saline; neutral.

The thickness of the A and C horizons ranges from 40 to 60 inches. Reaction ranges from very strongly acid to slightly alkaline. The electrical conductivity of the saturation extract ranges from 0 to 4 millimhos per centimeter. Salinity is typically less than 3 parts per thousand. The content of shell fragments ranges from 0 to 20 percent. The shell fragments may be so finely ground that visual identification is difficult.

The A horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 4. It is sand, coarse sand, or fine sand.

The C horizon has hue of 2.5Y or 5Y, value of 5 to 8, and chroma of 3 to 6. It is sand, coarse sand, or fine sand. Redoximorphic features frequently occur in this horizon.

The Cg or C′g horizon has hue of 5Y or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sand or loamy sand. The shell content ranges from 0 to 20 percent.

The Oe horizon has hue of 10YR to 5YR, value of 2 to 4, and chroma of 0 to 2. It is mucky peat or muck. Some pedons have thin subhorizons of mucky loamy sand. The content of soft wood fragments ranges from 5 to 35 percent. The buried surface layer occurs below a depth of 72 inches in some areas where the sand overburden is very thick.

BkA—Brockatonorton sand, 0 to 2 percent slopes

Composition

Brockatonorton soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Barrier island backshores
Slope: 0 to 2 percent
Note: All of the acreage of this map unit is on the barrier islands. Dominant vegetation is bayberry, salt myrtle, shore juniper, searocket, and seaside goldenrod. In some areas there are small blocks of pine trees. Vegetated areas provide excellent habitat for shoreline wildlife.

Component Description

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy eolian sediments over organic deposits
Flooding: Occasional
Kind of water table: Apparent
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: Included in this map unit are small areas of parking lots, buildings, and human-influenced soils on Assateague Island. The soil's organic layer is a result of the burial of prior bayside marshes by the landward migration of the barrier island.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Acquango soils in the slightly higher landform positions
• Askecksy soils in the slightly lower landform positions
• Purnell soils in adjacent tidal marshes

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

BkB—Brockatonorton sand, 2 to 5 percent slopes

Composition

Brockatonorton soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Barrier island backshores
Slope: 2 to 5 percent
Note: All of the acreage of this map unit is on the barrier islands. Dominant vegetation is bayberry, salt myrtle, shore juniper, sea rocket, and seaside goldenrod. In some areas there are small blocks of pine trees. Vegetated areas provide excellent habitat for shoreline wildlife.

Component Description

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy eolian sediments over organic deposits
Flooding: Occasional
Kind of water table: Apparent
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: Included in this map unit are small areas of parking lots, buildings, and human-influenced soils on Assateague Island. The soil's organic layer is a result of the burial of prior bayside marshes by the landward migration of the barrier island.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Acquango soils in the slightly higher landform positions
• Askecksy soils in the slightly lower landform positions
• Purnell soils in adjacent tidal marshes

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Cedartown Series

The soils of the Cedartown series are very deep and somewhat excessively drained. Permeability is rapid. These soils formed in sandy eolian and fluviomarine sediments. They are located on uplands and ancient dunes of the mid-Atlantic Coastal Plain. Elevations are generally below 25 feet. Slopes range from 0 to 5 percent.

Cedartown soils are similar to Runclint soils and are commonly adjacent to Evesboro, Fort Mott, Klej, Rosedale, Runclint, and Woodstown soils. The Cedartown soils differ from Evesboro and Fort Mott soils in having redoximorphic features between depths of 48 and 72 inches. They differ from Klej and Woodstown soils in not having redoximorphic features above a depth of 40 inches. They differ from Rosedale soils in not having textures finer than loamy sand. They differ from Runclint soils in having more clay in the subsoil.

Typical pedon of Cedartown loamy sand in an area of Cedartown-Rosedale complex, 0 to 2 percent slopes; approximately 0.2 mile west of Bunn Ditch on Swancut Road, 50 feet south in a cultivated field:

Ap—0 to 6 inches; dark brown (10YR 3/3) loamy sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; abrupt wavy boundary.

E—6 to 14 inches; light yellowish brown (10YR 6/4) sand; massive; very friable; few fine and medium roots; very strongly acid; clear wavy boundary.

Bt—14 to 30 inches; strong brown (7.5YR 5/8) loamy sand; weak medium subangular blocky structure; very friable; common faint yellowish brown (10YR 5/6) clay bridging; very strongly acid; clear smooth boundary.

BC—30 to 42 inches; strong brown (7.5YR 5/8) loamy sand; weak coarse subangular blocky structure; very friable; extremely acid; gradual smooth boundary.

C1—42 to 54 inches; brownish yellow (10YR 6/6) sand; single grain; loose; extremely acid; clear wavy boundary.

C2—54 to 64 inches; yellowish brown (10YR 5/6) sand; massive; very friable; few fine distinct gray (10YR 6/1) and common medium distinct light brown (10YR 6/3) soft masses of iron accumulation; extremely acid; clear wavy boundary.

2Cg—64 to 72 inches; gray (10YR 6/1) fine sandy loam; massive; firm, slightly sticky, nonplastic; few medium distinct yellowish brown (10YR 5/6) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 30 to 50 inches. The gravel content ranges from 0 to 5 percent in the solum and from 0 to 10 percent in the substratum. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. In cultivated areas, many pedons do not have an E horizon.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sand or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is sand or loamy sand.

The 2Cg horizon has hue of 5Y to 10YR, value of 3 to 7, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or silt loam. In some pedons this horizon occurs below a depth of 72 inches.

CeA—Cedartown-Rosedale complex, 0 to 2 percent slopes

Composition

Cedartown soil and similar soils: 55 percent
Rosedale soil and similar soils: 25 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland.

Component Description

Cedartown

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Dominant parent material: Sandy eolian deposits over fluviomarine sediments
Flooding: None
Kind of water table: Perched
Available water capacity: Low
Note: Elevations are generally below 25 feet. This soil is most commonly in the Pocomoke State Forest area and east of the sea escarpment.

Rosedale

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Well drained
Dominant parent material: Sandy eolian deposits over loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Elevations are generally below 25 feet. This soil is most commonly in the Pocomoke State Forest area and east of the sea escarpment.

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Runclint soils intermingled in landform positions similar to those of the Cedartown and Rosedale soils
- Evesboro, Fort Mott, and Galestown soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

CeB—Cedartown-Rosedale complex, 2 to 5 percent slopes

Composition

Cedartown soil and similar soils: 55 percent
Rosedale soil and similar soils: 25 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland.

Component Description

Cedartown

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Dominant parent material: Sandy eolian deposits over fluviomarine sediments
Flooding: None
Kind of water table: Perched
Available water capacity: Low
Note: Elevations are generally below 25 feet. This soil is most commonly in the Pocomoke State Forest area and east of the sea escarpment.

Rosedale

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Well drained
Dominant parent material: Sandy eolian deposits over loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Elevations are generally below 25 feet. This soil is most commonly in the Pocomoke State Forest area and east of the sea escarpment.

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Runclint soils intermingled in landform positions similar to those of the Cedartown and Rosedale soils
- Evesboro, Fort Mott, and Galestown soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Chicone Series

The soils of the Chicone series are very deep and very poorly drained. Permeability is moderate. These soils formed in loamy alluvial sediments overlying moderately decomposed organic deposits derived from freshwater swamp vegetation. They are located along the upland edges of wide flood plains of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Chicone soils are similar to Puckum soils and are commonly adjacent to Puckum, Manahawkin, Zekiah, and Indiantown soils. The Chicone soils differ from Puckum and Manahawkin soils in having a mineral surface overburden more than 16 inches thick. They differ from Zekiah and Indiantown soils in not having a black mineral surface layer more than 24 inches thick and in having formed in organic deposits.

Typical pedon of Chicone mucky silt loam; on a smooth 0 percent slope, approximately 350 feet east of Jones Road along Marshall Creek, in a wooded swamp:

Ag—0 to 10 inches; very dark grayish brown (10YR 3/2) mucky silt loam; weak fine granular structure; friable, slightly sticky; many very fine and fine and common medium roots; common very fine and fine tubular pores; strongly acid; clear wavy boundary.

Cg—10 to 18 inches; dark grayish brown (10YR 4/2) silt loam, gray (10YR 6/2) dry; massive; friable, slightly sticky; common very fine and fine roots; few very fine and fine tubular pores; common fine prominent strong brown (7.5YR 4/6) soft masses of iron accumulation; strongly acid; gradual wavy boundary.

Oe—18 to 27 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; fiber content is between one-tenth and three-quarters of the soil volume after rubbing; 35 percent mineral soil material; strongly acid; clear smooth boundary.

Oa—27 to 36 inches; black (10YR 2/1) muck, sapric soil material; fiber content is less than one-tenth the soil volume after rubbing; 40 percent mineral soil material; strongly acid; clear wavy boundary.

2Cg1—36 to 45 inches; black (N 2/0) silt loam; massive; firm, slightly sticky, slightly plastic; strongly acid; clear wavy boundary.

2Cg2—45 to 68 inches; gray (10YR 6/1) sand; single grain; loose; strongly acid; gradual wavy boundary.

2Cg3—68 to 80 inches; dark grayish brown (10YR 4/2) loam; few medium rounded bodies of gray (10YR 5/1) silt loam; massive; very strongly acid.

The thickness of the mineral surface and subsurface layers ranges from 16 to 40 inches. There are no diagnostic organic layers in the upper 16 inches. Thickness of the organic deposits ranges from 16 to greater than 64 inches. Reaction ranges from extremely acid to strongly acid.

The Ag horizon has hue of 10YR or 7.5YR, value of 2 to 4, and chroma of 1 to 3. Where the horizon has value of less than 3.5, it is less than 10 inches thick. The horizon is mucky silt loam, mucky loam, loam, or silt loam.

The Cg horizon is neutral in hue or has hue of 10YR or 7.5YR, has value of 2 to 5, and has chroma of 0 to 2. It is silt loam or mucky silt loam. In some pedons it may have thin layers of sandy loam or loam.

The O horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 2. It is mucky peat, peat, or muck. The mineral content ranges from 20 to 65 percent.

The 2Cg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 0 to 2. It ranges from sand to clay loam. Stratification is common in this horizon, and textures are extremely variable.

Ch—Chicone mucky silt loam

Composition

Chicone soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Flood plains
Slope: 0 to 2 percent
Note: All of the acreage of this map unit is located in wooded wetlands along Nassawango Creek and the Pocomoke River. Dominant vegetation is baldcypress, sweetgum, and red maple. The understory includes sweetbay, American holly, ferns, sedges, and mosses. These areas provide excellent habitat for wetland wildlife, including many birds, amphibians, reptiles, and small mammals. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and pollutants.

Component Description

Surface layer texture: Mucky silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty alluvial sediments over organic deposits
Flooding: Occasional
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: High
Note: This soil is the result of the deposition of mineral sediment on top of organic swamp soils. It commonly occurs adjacent to drainageway side slopes near the transition to mineral upland soils.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Zekiah and Indiantown soils at the slightly higher elevations on flood plains
- Manahawkin and Puckum soils at the slightly lower elevations on flood plains

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Elkton Series

The soils of the Elkton series are very deep and poorly drained. Permeability is slow. These soils formed in silty alluvial and fluviomarine deposits overlying sandy fluviomarine sediments. They are on lowland flats and in small depressions of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Elkton soils are similar to Othello soils and are commonly adjacent to Kentuck, Mattapex, and Othello soils. The Elkton soils contain more clay in the B horizon than Kentuck and Othello soils. They also differ from Kentuck soils in not having a black surface horizon more than 10 inches thick. They differ from Mattapex soils in having redoximorphic features in the surface and subsurface horizons.

Typical pedon of Elkton silt loam; approximately 200 feet north on Patey Woods Road from Ninepin Branch Road, 100 feet west, in a low-lying woodland:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; many very fine, common fine and medium, and few coarse roots; many very fine and few fine tubular pores; very strongly acid; clear smooth boundary.

Eg—4 to 11 inches; light brownish gray (2.5Y 6/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common fine and few medium and coarse roots; many very fine and few fine and medium tubular pores; extremely acid; clear wavy boundary.

Btg1—11 to 20 inches; gray (5Y 5/1) silt loam; strong medium and coarse blocky structure; firm, sticky, slightly plastic; few fine roots; few fine vesicular and common fine tubular pores; common coarse prominent strong brown (7.5YR 5/6) soft masses of iron accumulation; common prominent dark gray (5Y 4/2) clay films on faces of peds and lining soil pores; extremely acid; gradual smooth boundary.

Btg2—20 to 38 inches; gray (5Y 6/1) silty clay loam;

weak thick platy structure parting to strong coarse subangular blocky; firm, very sticky, plastic; few fine roots; common very fine vesicular and common fine tubular pores; common medium distinct yellowish brown (10YR 5/8) soft masses of iron accumulation; common prominent dark gray (5Y 4/2) clay films on faces of peds and lining soil pores; very strongly acid; clear smooth boundary.

Btg3—38 to 47 inches; gray (5Y 6/1) silty clay loam; moderate thick platy structure parting to medium coarse subangular blocky; firm, very sticky, plastic; few fine roots; few fine and very fine tubular pores; common prominent dark gray (5Y 4/2) clay films on faces of peds and lining soil pores; very strongly acid; clear smooth boundary.

BCg—47 to 58 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine vesicular pores; very strongly acid; abrupt wavy boundary.

2Ab—58 to 68 inches; black (10YR 2/1) sandy loam; massive; friable, slightly sticky; extremely acid; clear wavy boundary.

2Cgb—68 to 72 inches; dark gray (10YR 4/1) loamy sand; massive; very friable; extremely acid.

The thickness of the solum ranges from 40 to 60 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ag horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 3. It is silt loam or sandy loam.

The Eg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is silt loam.

The Btg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 0 to 2. It is silty clay loam or silty clay, but it has an average of 27 to 35 percent clay in the particle-size control section.

The BCg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It is silt loam.

A 2BCg horizon occurs in some pedons. It has colors similar to those of the BCg horizon. It is fine sandy loam or very fine sandy loam.

The 2Ab horizon, if it occurs, has hue of 10YR to 5Y, value of 2 or 3, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

The 2Cg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 0 to 2. It is sand or loamy sand.

Ek—Elkton sandy loam

Composition

Elkton soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 1 percent
Note: The majority of this map unit is woodland, and the remainder is cropland. The map unit commonly occurs on the low-lying flats of the Pocomoke River basin and in the northeastern part of the county along the Wicomico County border.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Silty alluvial and fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: Some areas of this map unit may remain ponded for extended periods.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Kentuck soils in small depressions and in the slightly lower landform positions
- Othello soils in landform positions similar to those of the Elkton soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Em—Elkton silt loam

Composition

Elkton soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: The majority of this map unit is woodland, and the remainder is cropland. The map unit commonly occurs on the low-lying flats of the Pocomoke River basin and in the northeastern part of the county along the Wicomico County border.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Silty alluvial and fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High
Note: Some areas of this map unit may remain ponded for extended periods.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Kentuck soils in small depressions and in the slightly lower landform positions
- Othello soils intermingled in landform positions similar to those of the Elkton soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Evesboro Series

The soils of the Evesboro series are very deep and excessively drained. Permeability is rapid. These soils formed in sandy eolian and fluviomarine sediments. They are located on uplands and ancient dunes of the mid-Atlantic Coastal Plain. Elevations are typically above 20 feet. Slopes range from 0 to 10 percent.

Evesboro soils are similar to Runclint soils and are commonly adjacent to Cedartown, Fort Mott, Klej, and Runclint soils. The Evesboro soils differ from Cedartown and Fort Mott soils in not having a loamy subsoil. They differ from Klej soils in not having redoximorphic features above a depth of 40 inches. They differ from Runclint soils in not having redoximorphic features between depths of 48 and 72 inches.

Typical pedon of Evesboro loamy sand, 0 to 2 percent slopes; approximately 1/4 mile south of Furnace Road on Millville Road, 350 feet west in the woods:

A—0 to 4 inches; dark brown (10YR 3/3) loamy sand; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

C1—4 to 42 inches; yellow (10YR 7/6) sand; single grain; very friable; common very fine and fine roots; strongly acid; clear smooth boundary.

C2—42 to 66 inches; brownish yellow (10YR 6/6) and light gray (10YR 7/1) sand; massive; loose; extremely acid; gradual wavy boundary.

C3—66 to 80 inches; brownish yellow (10YR 6/6) sand; massive; loose; few strong brown (10YR 4/6) lamellae; extremely acid.

The thickness of the A and C horizons is greater than 72 inches. The gravel content ranges from 0 to 20 percent in the substratum. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. It is loamy sand or sand. In some pedons thin lamellae of sandy loam occur above a depth of 72 inches. The content of fragments ranges from 0 to 20 percent.

EvA—Evesboro loamy sand, 0 to 2 percent slopes

Composition

Evesboro soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. Elevations are generally above 20 feet. This map unit commonly occurs on ancient dunal topography in the areas of Pocomoke State Forest, Millville, and Mt. Olive Church. Smaller areas of this unit occur southeast of the Pocomoke River near Snow Hill.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low
Note: The gravel content in the substratum can range to as much as 15 percent.

A typical soil description is included in this section.

Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown, Rosedale, and Runclint soils in the slightly lower landform positions
- Fort Mott and Galestown soils in landform positions similar to those of the Evesboro soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

EvB—Evesboro loamy sand, 2 to 5 percent slopes

Composition

Evesboro soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. Elevations are generally above 20 feet. This soil commonly occurs on ancient dunal topography in areas of the Pocomoke State Forest, Millville, and Mt. Olive Church. Smaller areas of this unit occur southeast of the Pocomoke River near Snow Hill.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low
Note: The gravel content in the substratum can range to as much as 15 percent.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown, Rosedale, and Runclint soils in the slightly lower landform positions
- Fort Mott and Galestown soils in landform positions similar to those of the Evesboro soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

EvC—Evesboro loamy sand, 5 to 10 percent slopes

Composition

Evesboro soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Stream terraces and side slopes
Slope: 5 to 10 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. Elevations are generally above 20 feet. This map unit commonly occurs on ancient dunal topography in areas of the Pocomoke State Forest, Millville, and Mt. Olive Church. Smaller areas of this unit occur southeast of the Pocomoke River near Snow Hill and on isolated ridges and along side slopes of creeks and rivers throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low
Note: The gravel content in the substratum can range to as much as 15 percent.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown and Runclint soils at the toe of slopes and in the slightly lower landform positions
- Galestown soils intermingled in landform positions similar to those of the Evesboro soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Fallsington Series

The soils of the Fallsington series are very deep and poorly drained. Permeability is moderate. These soils formed in loamy fluviomarine sediments. They are on broad lowland flats of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Fallsington soils are similar to Hurlock soils and are commonly adjacent to Klej, Woodstown, Hammonton, and Mullica soils. The Fallsington soils contain more clay in the B horizon than Hurlock soils. They differ from Klej, Woodstown, and Hammonton soils in having redoximorphic features in the surface and subsurface horizons. They differ from Mullica soils in not having a thick black surface horizon.

Typical pedon of Fallsington sandy loam; approximately 0.4 mile east of Byrd Road along Bromley Road, 800 feet south, in low-lying woodland:

Ag—0 to 5 inches; very dark gray (10YR 3/1) sandy loam; weak fine granular structure; friable, slightly sticky, nonplastic; many very fine and common fine and medium roots; many very fine and fine and common medium vesicular and tubular pores; moderately acid; clear wavy boundary.

AEg—5 to 9 inches; gray (2.5Y 3/2) sandy loam; weak medium subangular blocky structure; friable, slightly sticky; many very fine, common fine, and few medium roots; many very fine and common fine tubular pores; very strongly acid; gradual wavy boundary.

Eg—9 to 14 inches; gray (2.5Y 5/1) sandy loam; weak medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; many very fine and fine and common medium tubular pores; friable; strongly acid; clear smooth boundary.

Btg1—14 to 19 inches; gray (2.5Y 5/1) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; many very fine and common fine tubular pores; few medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; few faint dark gray (10YR 3/1) clay films on faces of peds and lining soil pores; very strongly acid; gradual wavy boundary.

Btg2—19 to 26 inches; gray (5Y 5/1) sandy clay loam; moderate medium subangular blocky structure; firm, slightly sticky, slightly plastic; common very fine and fine vesicular and tubular pores; common medium prominent brownish yellow (10YR 6/6) soft masses of iron accumulation; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; very strongly acid; clear wavy boundary.

Cg1—26 to 35 inches; olive gray (2.5Y 6/1) loamy sand; massive; very friable; few fine and medium prominent brownish yellow (10YR 6/6) soft masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg2—35 to 80 inches; stratified light gray (2.5Y 7/1) sand and loamy sand; single grain; loose; few coarse prominent light olive brown (2.5Y 5/6) soft masses of iron accumulation; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ag or Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is loam or sandy loam.

The Eg or AEg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy loam, loam, or sandy clay loam and has an average clay content of 18 to 27 percent in the particle-size control section.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sand or loamy sand.

Fa—Fallsington sandy loam

Composition

Fallsington soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This map unit commonly occurs in the southern and eastern parts of the county. Smaller areas of the unit are scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Woodstown and Klej soils in the slightly higher landform positions
- Mullica and Berryland soils in the lower landform positions
- Askecksy and Hurlock soils intermingled in landform positions similar to those of the Fallsington soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Fort Mott Series

The soils of the Fort Mott series are very deep and well drained. Permeability is moderate. These soils formed in sandy and loamy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 10 percent.

Fort Mott soils are similar to Rosedale soils and are commonly adjacent to Evesboro, Cedartown, Galestown, Rosedale, and Runclint soils. The Fort Mott soils differ from Galestown soils in having sandy surface and subsurface horizons more than 20 inches thick. They differ from Evesboro soils in having a loamy subsoil. They differ from Cedartown, Rosedale, and Runclint soils in not having redoximorphic features above a depth of 72 inches.

Typical pedon of Fort Mott loamy sand, 0 to 2 percent slopes; approximately 1/4 mile northwest on Whiteburg Road from Dividing Creek Road at the sharp corner, 100 feet northwest, in a cultivated field:

Ap—0 to 12 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

E—12 to 30 inches; brownish yellow (10YR 6/6) loamy sand; weak fine subangular blocky structure; very friable; many very fine and fine roots; strongly acid; clear smooth boundary.

Bt—30 to 42 inches; strong brown (7.5YR 5/8) sandy loam; moderate medium subangular blocky structure; friable; few very fine and fine irregular pores; common very fine and fine roots; common faint strong brown (7.5YR 4/6) clay bridging between sand grains; strongly acid; gradual smooth boundary.

CB—42 to 48 inches; brownish yellow (10YR 6/6) loamy sand; weak fine subangular blocky structure; very friable; common very fine and fine roots; strongly acid; clear smooth boundary.

C1—48 to 54 inches; yellowish brown (10YR 5/6) loam; few fine distinct light gray (10YR 6/1) irregular areas of sand stripping; massive; extremely acid; gradual wavy boundary.

C2—54 to 80 inches; brownish yellow (10YR 6/6) sand; massive; extremely acid.

The thickness of the solum ranges from 30 to 55 inches. The gravel content ranges from 0 to 5 percent in the substratum. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sand or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, loam, or sandy clay loam. In some pedons, transitional CB or BC horizons occur.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is sandy loam, loamy sand, or sand. In some pedons thin lamellae occur.

FmA—Fort Mott loamy sand, 0 to 2 percent slopes

Composition

Fort Mott soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit occurs throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Sandy eolian deposits over loamy fluviomarine sediments
Flooding: None
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Evesboro, Galestown, and Sassafras soils intermingled on the tops of ridges and in landform positions similar to those of the Fort Mott soil
• Rosedale and Hambrook soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

FmB—Fort Mott loamy sand, 2 to 5 percent slopes

Composition

Fort Mott soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit occurs throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Sandy eolian deposits over loamy fluviomarine sediments
Flooding: None
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Evesboro, Galestown, and Sassafras soils intermingled on the tops of ridges and in landform positions similar to those of the Fort Mott soil
• Rosedale and Hambrook soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Galestown Series

The soils of the Galestown series are very deep and somewhat excessively drained. Permeability is rapid. These soils formed in sandy eolian and fluviomarine sediments. They are located on uplands and ancient dunes of the mid-Atlantic Coastal Plain. Elevations are generally above 20 feet. Slopes range from 0 to 5 percent.

Galestown soils are similar to Runclint soils and are commonly adjacent to Cedartown, Evesboro, Fort Mott, Klej, Rosedale, Runclint, and Woodstown soils. The Galestown soils differ from Evesboro and Runclint soils in having more clay in the subsoil. They differ from Klej and Woodstown soils in not having redoximorphic features above a depth of 40 inches. They differ from Fort Mott and Rosedale soils in not having textures finer than loamy sand. They differ from Cedartown soils in not having redoximorphic features above a depth of 72 inches.

Typical pedon of Galestown loamy sand, 2 to 5 percent slopes; approximately 2 miles east of Stockton on Route 366, about 250 feet south, in a cultivated field:

Ap—0 to 8 inches; grayish brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

E—8 to 16 inches; light yellowish brown (10YR 6/4) sand; single grain; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

Bt—16 to 38 inches; yellowish brown (10YR 5/8) loamy sand; weak fine subangular blocky structure; very friable; common very fine and fine roots; common faint yellowish brown (10YR 5/6) clay bridging between grains; strongly acid; gradual smooth boundary.

BC—38 to 54 inches; strong brown (7.5YR 5/8) loamy sand; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; very friable; common very fine and fine roots; strongly acid; clear smooth boundary.

C—54 to 72 inches; yellowish brown (10YR 5/6) sand; common medium distinct pale brown (10YR 6/3) mottles; single grain; loose; extremely acid.

The thickness of the solum ranges from 30 to 50 inches. The gravel content ranges from 0 to 5 percent in the solum and from 0 to 10 percent in the substratum. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sand or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is sand, loamy sand, fine sandy loam, or sandy loam. Some pedons have fine textured layers below a depth of 80 inches.

GaA—Galestown loamy sand, 0 to 2 percent slopes

Composition

Galestown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This map unit commonly occurs in areas of the Pocomoke State Forest, Millville, Mt. Olive Church, and Berlin. Smaller areas of this unit occur throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Evesboro and Fort Mott soils intermingled in landform positions similar to those of the Galestown soil
- Cedartown, Rosedale, and Runclint soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

GaB—Galestown loamy sand, 2 to 5 percent slopes

Composition

Galestown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This unit commonly occurs in areas of the Pocomoke State Forest, Millville, Mt. Olive Church, and Berlin. Smaller areas of this unit occur throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Evesboro and Fort Mott soils intermingled in landform positions similar to those of the Galestown soil
- Cedartown, Rosedale, and Runclint soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

GaC—Galestown loamy sand, 5 to 10 percent slopes

Composition

Galestown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Stream terraces and side slopes

Slope: 5 to 10 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. Elevations are generally above 20 feet. This map unit commonly occurs in the Pocomoke State Forest area and on ancient dune formations southeast of the Pocomoke River near Snow Hill. It also occurs on isolated ridges and along side slopes of creeks and rivers throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Evesboro soils intermingled on the tops of ridges
- Cedartown and Runclint soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Hambrook Series

The soils of the Hambrook series are very deep and well drained. Permeability is moderate. These soils formed in loamy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 15 percent.

Hambrook soils are similar to Sassafras soils and are commonly adjacent to Fort Mott, Galestown, Sassafras, and Woodstown soils. The Hambrook soils differ from Galestown soils in having more clay in the B horizon. They differ from Fort Mott soils in having more clay in the surface and subsurface horizons. They differ from Woodstown soils in not having redoximorphic features above a depth of 40 inches. They differ from Sassafras soils in having redoximorphic features between depths of 48 and 72 inches.

Typical pedon of Hambrook sandy loam, 2 to 5 percent slopes; on a smooth 3 percent slope, approximately 0.5 mile east of Route 113 on Ironshire Station Road, 100 feet south, in a cultivated field:

Ap—0 to 10 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; many very fine and common fine tubular pores; neutral; abrupt smooth boundary.

Bt1—10 to 21 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; many very fine and fine tubular and common fine vesicular pores; few distinct strong brown (7.5YR 5/8) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—21 to 33 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine and fine tubular and vesicular pores; common distinct strong brown (7.5YR 5/8) clay films on faces of peds; strongly acid; gradual smooth boundary.

BC—33 to 40 inches; strong brown (7.5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few very fine and fine roots; few very fine irregular pores; strongly acid; clear smooth boundary.

C1—40 to 48 inches; strong brown (7.5YR 5/6) loamy sand; massive; loose; few fine roots; extremely acid; clear smooth boundary.

C2—48 to 58 inches; brownish yellow (10YR 6/6) sand; few medium distinct light yellowish brown (2.5Y 6/3) mottles; single grain; loose; few very fine roots; extremely acid; gradual smooth boundary.

2Cg—58 to 72 inches; light gray (10YR 6/1) fine sandy loam; single grain; loose; few fine faint light gray (2.5Y 7/1) iron depletions; few fine distinct black (N 2.5/9) manganese concretions; extremely acid.

The thickness of the solum ranges from 25 to 40 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam or loamy sand.

The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam, sandy loam, or loam. The average clay content is between 18 and 27 percent.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is loamy sand or sand.

The 2Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2. It is fine sandy loam or silt loam.

HbA—Hambrook sandy loam, 0 to 2 percent slopes

Composition

Hambrook soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This map unit occurs throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Flooding: None
Kind of water table: Apparent
Available water capacity: High

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Rosedale and Cedartown soils intermingled in landform positions similar to those of the Hambrook soil
- Sassafras and Fort Mott soils in the slightly higher landform positions
- Woodstown and Mattapex soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

HbB—Hambrook sandy loam, 2 to 5 percent slopes

Composition

Hambrook soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit occurs throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Rosedale and Cedartown soils intermingled in landform positions similar to those of the Hambrook soil
- Sassafras and Fort Mott soils in the slightly higher landform positions
- Woodstown and Mattapex soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Hammonton Series

The soils of the Hammonton series are very deep and moderately well drained. Permeability is moderately rapid. These soils formed in loamy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 5 percent.

Hammonton soils are similar to Woodstown soils and are commonly adjacent to Cedartown, Fort Mott, Klej, Galestown, Rosedale, Hurlock, Fallsington, and Sassafras soils. The Hammonton soils differ from Fallsington and Hurlock soils in not having redoximorphic features in the surface and subsurface horizons. They differ from Klej soils in having more clay in the subsoil. They differ from Fort Mott, Galestown, Cedartown, Rosedale, and Sassafras soils in having redoximorphic features above a depth of 40 inches. They differ from Woodstown soils in having less clay in the subsoil.

Typical pedon of Hammonton loamy sand, 0 to 2 percent slopes; approximately 0.75 mile southeast of Klej Grange Road and 500 feet north of Ward Road on a farm lane, in woodland:

A—0 to 5 inches; dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; friable; many very fine, fine, and medium roots; few very fine irregular pores; neutral; abrupt smooth boundary.

BE—5 to 12 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; many very fine and fine roots; few very fine and fine irregular pores; moderately acid; clear smooth boundary.

Bt—12 to 25 inches; light olive brown (2.5Y 5/6) sandy loam; weak medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; few very fine and fine irregular pores; common faint yellowish brown (10YR 5/6) clay films on faces of peds; strongly acid; clear smooth boundary.

C—25 to 34 inches; light olive brown (2.5Y 5/6) loamy sand; massive; friable; common medium light brownish gray (2.5Y 6/2) iron depletions; strongly acid; clear smooth boundary.

Cg1—34 to 63 inches; light gray (2.5Y 7/1) and olive yellow (2.5Y 6/6) stratified sandy loam and loamy sand; massive; very friable; extremely acid; gradual smooth boundary.

Cg2—63 to 80 inches; light gray (2.5Y 7/1) sand; single grain; loose; common coarse prominent pale yellow (2.5Y 7/3) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 25 to 40 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam or loamy sand. The content of fragments ranges from 0 to 5 percent.

The BE horizon, or E horizon if it occurs, has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or loamy sand.

The Bt horizon has hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 4 to 8. It is sandy loam or loam. The average clay content is between 13 and 18 percent.

The BC horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is sand or loamy sand.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam and is commonly stratified.

HmA—Hammonton loamy sand, 0 to 2 percent slopes

Composition

Hammonton soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, shallow depressions, and swales
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit occurs in the southern and eastern parts of the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Cedartown, Rosedale, and Runclint soils in the slightly higher landform positions
- Fallsington and Hurlock soils in the slightly lower landform positions
- Woodstown and Klej soils intermingled in landform positions similar to those of the Hammonton soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

HmB—Hammonton loamy sand, 2 to 5 percent slopes

Composition

Hammonton soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, shallow depressions, and swales
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit occurs in the southern and eastern parts of the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown, Rosedale, and Runclint soils in the slightly higher landform positions
- Fallsington and Hurlock soils in the slightly lower landform positions
- Woodstown and Klej soils intermingled in landform positions similar to those of the Hammonton soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Hurlock Series

The soils of the Hurlock series are very deep and poorly drained. Permeability is moderately rapid. These soils formed in loamy fluviomarine sediments. They are on low-lying uplands and in broad depressions of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Hurlock soils are similar to Fallsington soils and commonly are adjacent to Klej, Hammonton, Askecksy, Woodstown, and Mullica soils. The Hurlock soils differ from Klej, Hammonton, and Woodstown soils in having low-chroma depletions or matrix in the surface and subsurface horizons. They differ from Mullica soils in not having a black surface horizon more than 10 inches thick. They differ from Fallsington soils in having less clay in the subsoil. They differ from Askecksy soils in having more clay in the subsoil.

Typical pedon of Hurlock loamy sand; about 0.3 mile north of Stockton Road, 200 feet west of Lambertson Road, in a cultivated field:

Ap—0 to 7 inches; very dark gray (10YR 3/1) loamy sand; weak fine subangular blocky structure; very friable; common very fine and fine roots; moderately acid; abrupt smooth boundary.

BEg—7 to 17 inches; light brownish gray (2.5Y 6/2) sandy loam; weak medium subangular blocky structure; friable; few very fine and fine roots; common fine distinct brownish yellow (10YR 6/8) soft masses of iron accumulation; moderately acid; clear wavy boundary.

Btg—17 to 29 inches; light gray (2.5Y 7/2) sandy loam; weak medium subangular blocky structure; few very fine and fine irregular and vesicular pores; common medium distinct yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/6) soft masses of iron accumulation; common distinct gray (10YR 5/1) clay films on faces of peds; moderately acid; gradual smooth boundary.

Cg1—29 to 36 inches; light gray (2.5Y 7/2) loamy sand; massive; very friable; common medium distinct yellowish brown (10YR 5/8) and few medium distinct brownish yellow (10YR 6/6) soft masses of iron accumulation; strongly acid; clear wavy boundary.

Cg2—36 to 58 inches; light gray (2.5Y 7/1) stratified loamy sand and sandy loam; massive; very friable; few medium distinct yellowish brown (10YR 5/8) and few fine distinct brownish yellow (10YR 6/6) soft masses of iron accumulation; strongly acid; abrupt smooth boundary.

2Ab—58 to 72 inches; dark gray (N 4/0) silty clay loam; massive; firm, moderately sticky, moderately plastic; extremely acid.

The thickness of the solum ranges from 20 to 30 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is loam, sandy loam, or loamy sand.

The BEg or Eg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy loam or loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sandy loam or loam. The average clay content is between 12 and 18 percent.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

The 2Ab horizon, if it occurs, has hue of 10YR or is neutral in hue, has value of 3 or 4, and has chroma of 0 to 3. It is loam, silt loam, or silty clay loam.

Hu—Hurlock loamy sand

Composition

Hurlock soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This unit occurs in the southern and eastern parts of the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: Buried surface layers and shell beds commonly occur below a depth of 60 inches in the Klej Grange area.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Askecksy and Fallsington soils intermingled in landform positions similar to those of the Hurlock soil
- Hammonton and Klej soils in the slightly higher landform positions
- Mullica and Berryland soils in the lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Indiantown Series

The soils of the Indiantown series are very deep and very poorly drained. Permeability is moderate. These soils formed in loamy alluvial deposits overlying sandy alluvial and marine sediments. They are located on narrow flood plains of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Indiantown soils are similar to Zekiah soils and are commonly adjacent to Zekiah, Manahawkin, Galestown, and Evesboro soils. The Indiantown soils differ from Zekiah soils in having a thick black surface horizon. They differ from Manahawkin soils in not having formed in organic soil material. They differ from Galestown and Evesboro soils in being occasionally flooded and having redoximorphic features above a depth of 72 inches.

Typical pedon of Indiantown silt loam; on a smooth 0 percent slope, 1 mile north of Millville Road, 300 feet northwest of Route 12, along Millville Creek, on a wooded flood plain:

A1—0 to 13 inches; very dark brown (10YR 2/2) silt loam; weak fine platy structure; friable, slightly sticky; many very fine and fine and common coarse roots; many very fine and fine vesicular and common very fine tubular pores; very strongly acid; abrupt wavy boundary.

A2—13 to 25 inches; black (10YR 2/1) mucky loam; massive; friable, slightly sticky; common very fine and fine roots; common very fine and fine tubular pores; very strongly acid; abrupt wavy boundary.

Cg1—25 to 41 inches; grayish brown (10YR 5/2) sand; single grain; loose; few very fine roots; common coarse prominent very dark gray (10YR 3/1) organic stains; very strongly acid; clear wavy boundary.

Cg2—41 to 51 inches; dark grayish brown (2.5Y 4/2) loamy sand; massive; very friable; common medium distinct very dark gray (10YR 3/1) organic stains; very strongly acid; clear wavy boundary.

Cg3—51 to 72 inches; dark grayish brown (2.5Y 4/2) sand; single grain; loose; few medium prominent dark yellowish brown (10YR 5/6) soft masses of iron accumulation; few medium distinct very dark gray (10YR 3/1) organic stains; very strongly acid.

The thickness of the A horizon is greater than 24 inches. The combined thickness of the A and C horizons is greater than 72 inches. Organic staining frequently occurs in the Cg horizon. Reaction ranges from extremely acid to strongly acid in all horizons. These soils are occasionally flooded during storm events.

The A horizon has hue of 7.5YR to 2.5Y or is neutral in hue, has value of 2 or 3, and has chroma of 0 to 2. It is mucky silt loam or mucky loam.

The Cg horizon has hue of 10YR to 5Y, value of 3 to 7, and chroma of 1 to 3. It is sand, loamy sand, or sandy loam. Buried surface layers, organic staining, and stratification may occur within this horizon.

In—Indiantown silt loam

Composition

Indiantown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Flood plains
Slope: 0 to 1 percent
Note: All of the acreage of this map unit is wooded wetlands along streams throughout the county. Dominant vegetation is baldcypress, sweetgum, and red maple. The understory includes sweetbay, American holly, ferns, sedges, and mosses. These areas provide excellent habitat for wetland wildlife, including many birds, amphibians, reptiles, and small mammals. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Loamy alluvial sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: Moderate
Note: The thickness of the black surface layer is generally greater than 24 inches except in transitional areas, where it may be less than 20 inches.

A typical soil description is included in this section.

Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Chicone and Manahawkin soils at the slightly lower elevations on flood plains
- Zekiah soils at the slightly higher elevations on flood plains

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Kentuck Series

The soils of the Kentuck series are very deep and very poorly drained. Permeability is moderately slow. These soils formed in moderately organic silty deposits overlying loamy alluvial and marine sediments. They are in small depressions and isolated low-lying areas of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Kentuck soils are similar to Othello soils and are commonly adjacent to Elkton and Othello soils. The Kentuck soils differ from Elkton and Othello soils in having a black moderately organic surface layer that is more than 10 inches thick.

Typical pedon of Kentuck silt loam; on a smooth 0 percent slope, about 0.3 mile south of Cedartown Road on Double Bridges Road, 500 feet west, in a cultivated field:

Ap—0 to 12 inches; black (10YR 2/1) silt loam; moderate fine granular structure; very friable, slightly sticky, slightly plastic; many very fine and fine and common medium and coarse roots; common very fine and fine tubular pores; 10 percent organic matter; extremely acid; clear wavy boundary.

AE—12 to 16 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; common very fine and fine and few medium roots; common very fine and fine tubular and common fine vesicular pores; common medium faint dark grayish brown (10YR 4/2) and few fine prominent gray (10YR 5/1) irregularly shaped iron depletions; very strongly acid; clear wavy boundary.

Btg—16 to 36 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; friable, sticky, plastic; common very fine and fine and few medium roots; common very fine and fine vesicular pores; few fine prominent strong brown (7.5YR 5/8) soft masses of iron accumulation; common faint light gray (5Y 6/1) clay films on faces of peds; very strongly acid; clear wavy boundary.

2Cg—36 to 46 inches; light gray (10YR 6/1) sand; single grain; loose; few very fine and fine roots; very strongly acid; gradual wavy boundary.

3Cg—46 to 54 inches; dark grayish brown (10YR 4/2) clay loam; massive; firm, slightly sticky, slightly plastic; very strongly acid; gradual wavy boundary.

4Cg—54 to 72 inches; light gray (10YR 6/1) coarse sand; single grain; loose; very strongly acid.

The thickness of the solum ranges from 34 to 50 inches. The thickness of the umbric surface horizon ranges from 10 to 20 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from slightly acid to neutral in limed areas. The C horizon may exhibit stratification.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is mucky silt loam or silt loam.

The AE horizon, if it occurs, has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 or 2. It is silt loam.

An Eg horizon occurs in some pedons. It has colors similar to those of the AE horizon.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is silt loam or silty clay loam.

A 2Btg horizon occurs in some pedons. It has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 or 2. It is very fine sandy loam, loam, or clay loam.

The 2Cg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is sand or loamy sand.

The 3Cg horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is silt loam, silty clay loam, or clay loam.

The 4Cg horizon, if it occurs, has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 3. It is coarse sand or loamy coarse sand.

Ke—Kentuck silt loam

Composition

Kentuck soil and similar soils: 85 percent
Inclusions: 15 percent

Setting

Landform: Lowlands, depressions, and swales
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This unit commonly occurs on the low-lying flats of the Pocomoke River basin and in scattered areas in the southern and middle parts of the county.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: Moderate
Note: This soil may remain ponded for extended periods.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Elkton and Othello soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Klej Series

The soils of the Klej series are very deep and moderately well drained. Permeability is rapid. These soils formed in sandy eolian and fluviomarine sediments. They are on low-lying uplands and in broad depressions of the mid-Atlantic Coastal Plain. Slopes range from 0 to 5 percent.

Klej soils are similar to Runclint soils and commonly are adjacent to Askecksy, Cedartown, Evesboro, Rosedale, and Runclint soils. The Klej soils contain less clay in the subsoil than Cedartown and Rosedale soils. They differ from Askecksy soils in not having redoximorphic features in the surface and subsurface horizons. They differ from Evesboro and Runclint soils in having redoximorphic features in the subsoil.

Typical pedon of Klej loamy sand, 0 to 2 percent slopes; about 0.2 mile north of Mount Olive Church on Mount Olive Church Road, 150 feet northwest, in woodland:

A—0 to 3 inches; dark brown (10YR 3/3) loamy sand; weak fine granular structure; very friable; common very fine and fine roots; moderately acid; abrupt smooth boundary.

BE—3 to 16 inches; light olive brown (2.5Y 5/6) loamy sand; single grain; loose; few very fine and fine roots; moderately acid; clear wavy boundary.

Bw—16 to 20 inches; light olive brown (2.5Y 5/6) loamy sand; weak fine subangular blocky structure; very friable; few very fine and fine roots; strongly acid; clear smooth boundary.

C1—20 to 28 inches; light olive brown (2.5Y 5/4) loamy sand; single grain; loose; strongly acid; clear wavy boundary.

C2—28 to 38 inches; light olive brown (2.5Y 5/4) sand; massive; very friable; common fine distinct light yellowish brown (10YR 5/6) masses of iron accumulation and common medium distinct light brownish gray (10YR 6/2) irregularly shaped iron depletions; very strongly acid; clear wavy boundary.

Cg1—38 to 60 inches; gray (10YR 5/1) sand; single grain; loose; few fine prominent strong brown (7.5YR 5/8) and common fine distinct light olive brown (2.5Y 5/6) soft masses of iron accumulation; extremely acid; gradual smooth boundary.

Cg2—60 to 72 inches; light gray (10YR 6/1) sand; single grain; loose; extremely acid.

The thickness of the solum ranges from 20 to 30 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4. It is loamy sand or sand.

The BE or E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is loamy sand or sand.

The Bw horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is loamy sand.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is loamy sand or sand.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

KsA—Klej loamy sand, 0 to 2 percent slopes

Composition

Klej soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, lowland flats, and shallow depressions
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This unit commonly occurs in areas of the Pocomoke State Forest, Millville, and Mt. Olive Church and in the eastern part of the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy eolian deposits over fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: A weakly expressed layer of humus accumulation with dark reddish brown color may occur in this soil, especially in the Pocomoke State Forest area.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Runclint and Cedartown soils in the slightly higher landform positions
- Hammonton soils intermingled in landform positions similar to those of the Klej soil
- Askecksy and Hurlock soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

KsB—Klej loamy sand, 2 to 5 percent slopes

Composition

Klej soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, lowland flats, and shallow depressions
Slope: 2 to 5 percent

Note: Most of the acreage of this map unit is woodland, and the remainder is cropland. This unit commonly occurs in areas of the Pocomoke State Forest, Millville, and Mt. Olive Church and in the eastern part of the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Sandy eolian deposits over fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: A weakly expressed layer of humus accumulation with dark reddish brown color may occur in this soil, especially in the Pocomoke State Forest area.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Runclint and Cedartown soils in the slightly higher landform positions
- Hammonton soils intermingled in landform positions similar to those of the Klej soil
- Askecksy and Hurlock soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Manahawkin Series

The soils of the Manahawkin series are very deep and very poorly drained. Permeability is moderately rapid. These soils formed in moderately thick organic deposits derived from freshwater swamp vegetation overlying sandy alluvial sediments. They are located on wide flood plains of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Manahawkin soils are similar to Puckum soils and are commonly adjacent to Indiantown, Chicone, Mannington, Nanticoke, and Puckum soils. The Manahawkin soils differ from Indiantown, Mannington, and Nanticoke soils in having formed in organic soil materials. They differ from Chicone soils in not having a mineral overburden more than 16 inches thick. They differ from Puckum soils in having organic horizons less than 51 inches thick.

Typical pedon of Manahawkin muck; on a smooth 0 percent slope, approximately 1 mile north of Furnace Town, 200 feet west of Millville Road along Furnace Branch, on a wooded flood plain:

Oa—0 to 16 inches; very dark brown (7.5YR 2.5/2) muck, sapric soil material; fiber content is less than one-tenth the soil volume after rubbing; many very fine, fine, and medium live roots; strongly acid; clear wavy boundary.

O´a1—16 to 35 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; fiber content is one-half the soil volume after rubbing; common fine live roots; strongly acid; gradual wavy boundary.

O´a2—35 to 42 inches; very dark brown (10YR 2/2) muck, sapric soil material; fiber content is one-eighth the soil volume after rubbing; common very fine live roots; strongly acid; abrupt wavy boundary.

Cg—42 to 80 inches; light brownish gray (10YR 6/2) stratified sand and loamy sand; single grain; loose; strongly acid.

The thickness of the organic deposits ranges from 16 to 50 inches. Reaction ranges from extremely acid to strongly acid. The conductivity of the saturation extract is less than 4 millimhos per centimeter. Salinity is typically less than 2 parts per thousand. These soils are occasionally flooded by tidal fresh water and/or storm events.

The surface tier has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 0 to 2. It is muck or mucky peat.

The subsurface tier has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. It is mucky peat or muck.

The bottom tier has hue of 10YR to 5Y, value of 2 to 7, and chroma of 1 to 3. It is generally mucky peat or muck but may also be sand or loamy sand.

Ma—Manahawkin muck

Composition

Manahawkin soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Swamps and flood plains
Slope: 0 to 1 percent
Note: All of the acreage of this map unit is wooded wetlands mainly along Nassawango Creek, Dividing Creek, and the Pocomoke River. Dominant vegetation is baldcypress, sweetgum,

and red maple. The understory includes sweetbay, American holly, ferns, sedges, and mosses. These areas provide excellent habitat for wetland wildlife, including many birds, amphibians, reptiles, and small mammals. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Muck
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic deposits over sandy alluvial sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Very long in duration
Available water capacity: Very high
Note: Some areas of this soil south of Porters Crossing and near open water may be flooded twice daily by tides.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Chicone soils in the slightly higher landform positions along the edge of flood plains
- Puckum soils intermingled at similar elevations on flood plains

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Mannington Series

The soils of the Mannington series are very deep and very poorly drained. Permeability is moderate. These soils formed in silty alluvial sediments overlying highly decomposed organic deposits derived from freshwater swamp vegetation. They are located on tidal mud flats of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Mannington soils are similar to Nanticoke soils and are commonly adjacent to Nanticoke, Manahawkin, and Puckum soils. The Mannington soils differ from Nanticoke soils in having an organic substratum. They differ from Manahawkin and Puckum soils in having formed in mineral materials.

Typical pedon of Mannington mucky silt loam in an area of Mannington and Nanticoke soils; on a smooth 0 percent slope, approximately 100 feet south of the Nassawango Road bridge along Nassawango Creek, on a vegetated mud flat:

A—0 to 19 inches; very dark brown (10YR 2/2) mucky silt loam; massive; friable, slightly sticky; *n* value greater than 1.0, material flows easily between fingers when squeezed; few very fine and fine tubular pores; 10 percent dark brown (7.5YR 3/2) organic fragments; moderately acid; gradual smooth boundary.

Cg—19 to 38 inches; dark brown (7.5YR 3/2) and strong brown (7.5YR 4/6) silt loam; massive; friable, slightly sticky, slightly plastic; *n* value greater than 1.0, material flows easily between fingers when squeezed; few very fine vesicular pores; moderately acid; clear smooth boundary.

Oa—38 to 80 inches; dark brown (7.5YR 3/2) muck, sapric soil material; fiber content is one-tenth the soil volume after rubbing; 15 percent strong brown (7.5YR 4/6) soft wood fragments; strongly acid.

Thickness of the surface mineral material ranges from 20 to 40 inches. The *n* value is greater than 1.0 in all mineral horizons. Thickness of the organic deposits ranges from 14 to 40 inches. Reaction ranges from extremely acid to slightly acid. The electrical conductivity of the saturation extract is less than 4 millimhos per centimeter. Salinity is typically less than 2 parts per thousand.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is mucky silt loam or silt loam.

The Cg horizon has hue of 7.5YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is silt loam or mucky silt loam.

The O horizon has hue of 10YR or 7.5YR, value of 0 to 3, and chroma of 2 or 3. It is muck or mucky peat.

MC—Mannington and Nanticoke soils

Composition

Mannington soil and similar soils: 50 percent
Nanticoke soil and similar soils: 45 percent
Inclusions: 5 percent

Setting

Landform: Mud flats
Slope: 0 to 1 percent
Note: All of the acreage of this map unit occurs on mud flats along Nassawango Creek and the Pocomoke River. Dominant vegetation is spatterdock, pickerel weed, and arrowhead. These

areas provide excellent habitat for wetland wildlife, including waterfowl. They also provide feeding and nursery areas for fish and crabs.

Component Description

Mannington

Surface layer texture: Mucky silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty alluvial sediments over organic deposits
Flooding: Frequent
Kind of water table: Apparent
Ponding: Very long in duration
Available water capacity: Very high
Note: The soil is flooded twice daily by tides and may only be exposed during extreme low tides. Salinity ranges from 0 to 4 parts per thousand.

Nanticoke

Surface layer texture: Mucky silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty alluvial sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Very long in duration
Available water capacity: High
Note: The soil is flooded twice daily by tides and may only be exposed during extreme low tides. Salinity ranges from 0 to 4 parts per thousand.

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Manahawkin and Puckum soils in the adjacent, slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Matapeake Series

The soils of the Matapeake series are very deep and well drained. Permeability is moderate. These soils formed in silty eolian and alluvial deposits overlying sandy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 10 percent.

Matapeake soils are similar to Nassawango soils and are commonly adjacent to Nassawango, Mattapex, and Othello soils. The Matapeake soils differ from Nassawango, Mattapex, and Othello soils in not having redoximorphic features above a depth of 72 inches.

Typical pedon of Matapeake silt loam, 0 to 2 percent slopes; on a 1 percent slope, at an elevation of 30 feet, approximately 0.5 mile south of Basketswitch Road on Route 113, about 2,500 feet east, in a cultivated field:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky; many very fine, fine, and medium roots; many very fine and fine and common medium tubular pores; strongly acid; abrupt smooth boundary.

Bt—10 to 32 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm, sticky, plastic; common very fine and fine roots; common very fine, fine, and medium tubular pores; few distinct strong brown (7.5YR 4/6) clay films on faces of peds; strongly acid; gradual smooth boundary.

2BC—32 to 38 inches; yellowish brown (10YR 5/6) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; few very fine and fine irregular pores; strongly acid; gradual smooth boundary.

2C1—38 to 48 inches; brownish yellow (10YR 6/6) loamy sand; weak fine subangular blocky structure; very friable; extremely acid; clear smooth boundary.

2C2—48 to 60 inches; yellow (10YR 7/4) sand; single grain; loose; extremely acid; clear smooth boundary.

2C3—60 to 80 inches; pale yellow (2.5Y 7/4) sand; few fine prominent strong brown (7.5YR 5/8) mottles; single grain; loose; extremely acid.

The thickness of the solum ranges from 28 to 50 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. The average clay content in the Bt horizon is 20 to 28 percent. The content of fine sand in the subsurface horizons and subsoil may range to 15 percent in some areas.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It is silt loam or fine sandy loam.

The E horizon, if it occurs, has hue of 7.5YR to

2.5Y, value of 5 or 6, and chroma of 4 to 6. It is silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is silt loam or silty clay loam.

The 2BC horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. It is loam, fine sandy loam, or sandy loam.

The 2C horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 0 to 6. It is silt loam, fine sandy loam, loamy fine sand, loamy sand, or sand.

MeA—Matapeake fine sandy loam, 0 to 2 percent slopes

Composition

Matapeake soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit is most extensive along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mattapex and Nassawango soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

MeB—Matapeake fine sandy loam, 2 to 5 percent slopes

Composition

Matapeake soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit is most extensive along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mattapex and Nassawango soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

MkA—Matapeake silt loam, 0 to 2 percent slopes

Composition

Matapeake soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent

Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit is most extensive along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Mattapex and Nassawango soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

MkB—Matapeake silt loam, 2 to 5 percent slopes

Composition

Matapeake soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit is most extensive along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Mattapex and Nassawango soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Mattapex Series

The soils of the Mattapex series are very deep and moderately well drained. Permeability is moderate. These soils formed in silty eolian and alluvial sediments overlying sandy fluviomarine sediments. They are on upland flats of the mid-Atlantic Coastal Plain. Slopes range from 0 to 5 percent.

Mattapex soils are similar to Woodstown soils and are commonly adjacent to Matapeake, Nassawango, and Othello soils. The Mattapex soils do not have the redoximorphic features that are typical in the surface and subsurface layers of Othello soils. They differ from Woodstown soils in having more silt in the surface horizons and subsoil. They differ from Matapeake and Nassawango soils in having redoximorphic features above a depth of 40 inches.

Typical pedon of Mattapex silt loam, 0 to 2 percent slopes; 1.25 miles north of Newark on old Route 113, about 1 mile northwest along a private lane, in a cultivated field:

Ap—0 to 8 inches; brown (10YR 5/3) silt loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many very fine and common fine and medium roots; many fine and medium tubular pores; neutral; abrupt smooth boundary.

E—8 to 13 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and few fine roots; many very fine and common fine tubular pores; neutral; clear wavy boundary.

Bt—13 to 23 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; sticky, plastic; few very fine and fine roots; common fine and medium tubular pores; common distinct strong brown (7.5YR 4/6) clay films on faces of peds and lining soil pores; very strongly acid; clear wavy boundary.

2C—23 to 42 inches; strong brown (7.5YR 5/8) loamy sand; weak medium subangular blocky structure; very friable; few very fine roots; common medium prominent light brownish gray (10YR 6/2) irregularly shaped iron depletions; very strongly acid; gradual wavy boundary.

2Cg—42 to 72 inches; light gray (10YR 6/1) stratified sand and loamy sand; single grain; loose; strongly acid.

The thickness of the solum ranges from 20 to 40 inches (See fig. 2). Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. The content of fine sand in the subsurface horizons and subsoil may range to 15 percent in some areas.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is silt loam or fine sandy loam.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is silt loam.

The Bt horizon has hue of 10YR to 2.5Y, value of 5 or 6, and chroma of 1 to 6. It is silt loam or silty clay loam.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 1 to 6. It is sandy loam or loamy sand.

The 2Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It ranges from sand to fine sandy loam and is commonly stratified.

MpA—Mattapex fine sandy loam, 0 to 2 percent slopes

Composition

Mattapex soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats, depressions, lowland flats, and swales
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit is most extensive along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing, in the Newark area, and on small rises on the low-lying flats of the Pocomoke River basin.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Othello and Elkton soils in the slightly lower landform positions
- Nassawango and Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

MpB—Mattapex fine sandy loam, 2 to 5 percent slopes

Composition

Mattapex soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats, depressions, lowland flats, and swales
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing, in the Newark area, and on small rises on the low-lying flats of the Pocomoke River basin.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)

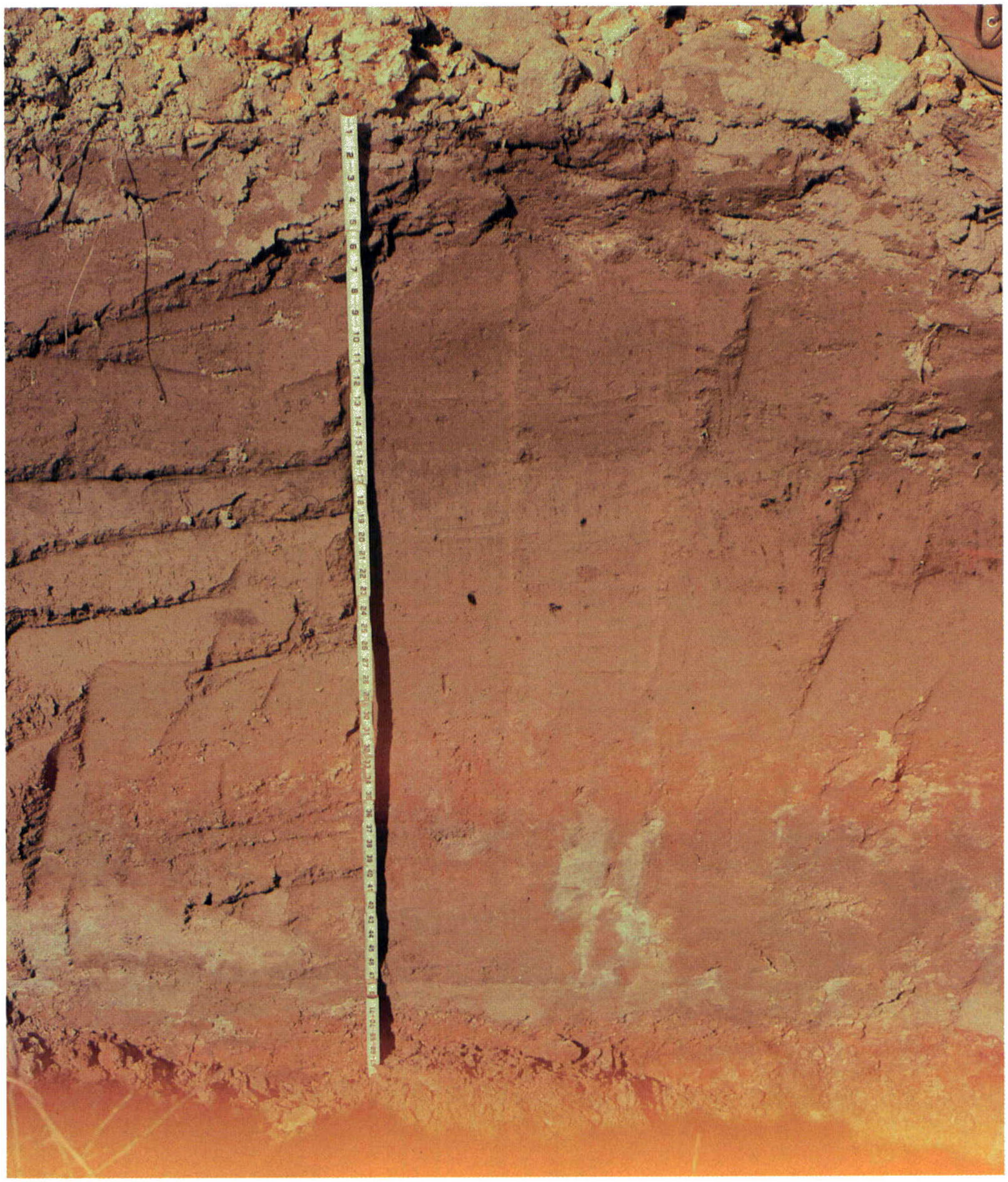


Figure 2.—An excavated area of Mattapex silt loam, 0 to 2 percent slopes, in a cultivated field near Newark on U.S. Highway 113. Depth to gray redoximorphic features is 24 inches. Depth to water table is 30 inches.

Drainage class: Moderately well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Othello and Elkton soils in the slightly lower landform positions
- Nassawango and Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about

Figure 3.—Close-up of the buried surface layer of a Mispillion soil in an area of Transquaking and Mispillion soils. Depth to the old surface is 47 inches. The core was taken near Oyster Pond in Assawoman Bay. Top of the sample is to the left.

managing this map unit, see the section "Use and Management of the Soils."

MqA—Mattapex silt loam, 0 to 2 percent slopes

Composition

Mattapex soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats, depressions, lowland flats, and swales
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing, in the Newark area, and on small rises on the low-lying flats of the Pocomoke River basin.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Othello and Elkton soils in the slightly lower landform positions
- Nassawango and Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

MqB—Mattapex silt loam, 2 to 5 percent slopes

Composition

Mattapex soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats, depressions, lowland flats, and swales
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing, in the Newark area, and on small rises on the low-lying flats of the Pocomoke River basin.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Othello and Elkton soils in the slightly lower landform positions
- Nassawango and Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Mispillion Series

The soils of the Mispillion series are very deep and very poorly drained. Permeability is moderate. These soils formed in moderately decomposed organic deposits derived from salt-tolerant vegetation overlying loamy marine and estuarine sediments. They are flooded twice daily by brackish tidal waters and are located in estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Mispillion soils are similar to Boxiron soils and are commonly adjacent to Broadkill, Transquaking, and Sunken soils. The Mispillion soils differ from Boxiron, Broadkill, and Sunken soils in having more than 16 inches of organic materials. They differ from Transquaking soils in having less than 51 inches of organic materials.

Typical pedon of Mispillion peat in an area of Transquaking and Mispillion soils; on a smooth 0 percent slope, 500 feet southeast of George Island Landing Road in Knox Marsh:

Oi—0 to 16 inches; dark brown (10YR 3/3) peat, fibric soil material; fiber content is four-fifths the soil volume after rubbing; 60 percent silt loam mineral material; many very fine and fine and common medium and coarse live roots; strongly saline; moderately alkaline; clear wavy boundary.

Oe—16 to 40 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; 50 percent dark gray (5Y 4/1) bands of silt loam; fiber content is one-half the soil volume after rubbing; common fine live roots; strongly saline; moderately alkaline; abrupt smooth boundary.

Cg1—40 to 46 inches; dark greenish gray (5GY 4/1) silt loam; massive; friable, slightly sticky; *n* value greater than 1.0, material flows easily between fingers when squeezed; 30 percent light olive brown (2.5Y 5/3) organic fragments; strongly saline; moderately alkaline; gradual wavy boundary.

Cg2—46 to 80 inches; dark gray (N 4/0) and pale olive (5Y 6/3) silt loam; massive; friable, slightly sticky; *n* value greater than 1.0, material flows easily between fingers when squeezed; 15 percent light olive brown (2.5Y 5/3) organic fragments; slightly saline; neutral.

The combined thickness of the organic horizons ranges from 16 to 50 inches (See fig. 3). Reaction ranges from neutral to moderately alkaline. The electrical conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity is typically greater than 22 parts per thousand. Thin layers of silt loam mineral material with a combined thickness of less than 4 inches sometimes occurs within the organic horizons. If dredged, these soils have a high potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less.

The surface tier has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 0 to 3. It is peat or mucky peat.

The subsurface tier has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 0 to 3. It is mucky peat or muck.

The bottom tier has hue of 10YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is dominantly silt loam or silty clay loam but may be mucky peat or muck in some areas. The *n* value is typically greater than 1.0 in the mineral horizons. In some pedons there are thin subhorizons of organic material.

The Cg horizon has hue of 2.5Y to 5B, value of 4 to 6, and chroma of 0 to 2. It is silt loam, silty clay loam, or loam.

Mullica Series

The soils of the Mullica series are very deep and very poorly drained. Permeability is rapid. These soils formed in sandy fluviomarine sediments. They are on low-lying flats and in broad depressions of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Mullica soils are similar to Berryland soils and commonly are adjacent to Askecksy, Klej, Berryland, and Runclint soils. The Mullica soils differ from Askecksy, Klej, and Runclint soils in having a black surface layer more than 10 inches thick. They differ from Berryland soils in not having a subsurface horizon of humus accumulation.

Typical pedon of Mullica mucky loamy sand in an area of Mullica-Berryland complex; about 0.1 mile east of Sheephouse Road on Aydelotte Road, approximately 400 feet west, in woodland:

A1—0 to 10 inches; black (10YR 2/1) mucky loamy sand; weak fine granular structure; very friable; common very fine and fine roots; moderately acid; clear smooth boundary.

A2—10 to 14 inches; very dark gray (10YR 3/1) sandy loam; weak fine subangular blocky structure; very friable; few very fine and fine roots; moderately acid; clear wavy boundary.

Bw—14 to 18 inches; dark grayish brown (2.5Y 4/1) sandy loam; massive; very friable, slightly sticky; few very fine and fine roots; strongly acid; clear wavy boundary.

BC—18 to 30 inches; gray (2.5Y 6/1) loamy sand; single grain; massive; very friable; very strongly acid; clear smooth boundary.

Cg1—30 to 43 inches; light gray (2.5Y 7/2) sand; single grain; loose; common medium distinct brownish yellow (10YR 6/6) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

Cg2—43 to 48 inches; light gray (2.5Y 7/1) sandy loam; massive; friable, slightly sticky; few medium prominent brownish yellow (10YR 6/8) soft masses of iron accumulation; very strongly acid; clear smooth boundary.

Cg3—48 to 65 inches; light gray (2.5Y 7/2) sand; single grain; loose; few medium prominent olive yellow (2.5Y 6/6) soft masses of iron accumulation; extremely acid; abrupt wavy boundary.

2Ab—65 to 75 inches; dark brown (10YR 3/3) silt loam; friable, slightly sticky, slightly plastic; 10 percent olive yellow (2.5Y 6/6) organic fragments; strongly acid.

The thickness of the solum ranges from 18 to 40 inches. In cultivated areas, many pedons do not have an E horizon. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is mucky loamy sand, loamy sand, sandy loam, or sand.

The AB or E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2. It is loamy sand or sandy loam.

The Bw horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is sandy loam or loamy sand.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2. It is sand, loamy sand, or sandy loam.

The 2Ab horizon, if it occurs, has hue of 10YR to 2.5Y, value of 1 to 3, and chroma of 0 to 3. It is silt loam or very fine sandy loam. In some pedons in the northern part of the county this horizon occurs below a depth of 80 inches.

Mu—Mullica-Berryland complex

Composition

Mullica soil and similar soils: 55 percent
Berryland soil and similar soils: 30 percent
Inclusions: 15 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: About half of the acreage of this map unit is woodland, and half is cropland. This unit commonly occurs along the Delaware State line, in the Pocomoke State Forest area, and in the

southern part of the county near the Virginia State line.

Component Description

Mullica

Surface layer texture: Mucky loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: Rare
Kind of water table: Apparent
Available water capacity: Low
Note: Wooded areas of this map unit may remain ponded for extended periods. The concentration of the Berryland soil in this map unit is variable, but it is least in the southern part of the county and greatest in the Pocomoke State Forest.

Berryland

Surface layer texture: Mucky loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Sandy fluviomarine sediments
Flooding: Rare
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: Low
Note: Wooded areas of this map unit may remain ponded for extended periods of time. The concentration of the Berryland soil in this map unit is variable, but it is least in the southern part of the county and greatest in the Pocomoke State Forest.

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Askecksy and Klej soils in the slightly higher landform positions
• Indiantown soils in the slightly lower landform positions near streams

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Nanticoke Series

The soils of the Nanticoke series are very deep and very poorly drained. Permeability is moderate. These soils formed in silty alluvial sediments. They are located on tidal mud flats of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Nanticoke soils are similar to Mannington soils and are commonly adjacent to Mannington, Manahawkin, and Puckum soils. The Nanticoke soils differ from Mannington soils in not having an organic substratum. They differ from Manahawkin and Puckum soils in having formed in mineral materials.

Typical pedon of Nanticoke mucky silt loam in an area of Mannington and Nanticoke soils; on a smooth 0 percent slope, at the confluence of Nassawango Creek and the Pocomoke River, on a vegetated mud flat:

A—0 to 30 inches; very dark grayish brown (2.5Y 3/2) mucky silt loam; massive; friable, slightly sticky; *n* value greater than 1.0, material flows easily between fingers when squeezed; 5 percent dark brown (7.5YR 3/2) organic fragments; moderately acid; gradual smooth boundary.

Cg—30 to 80 inches; very dark gray (2.5Y 3/1) silt loam; massive; friable, slightly sticky, slightly plastic; *n* value greater than 1.0, material flows easily between fingers when squeezed; moderately acid.

The thickness of the A and C horizons is greater than 80 inches. The *n* value is greater than 1.0 in all horizons. Some pedons have sand layers less than 3 inches thick in the Cg horizon. Reaction ranges from extremely acid to slightly acid. The electrical conductivity of the saturation extract is less than 4 millimhos per centimeter. Salinity typically is less than 2 parts per thousand.

The A or Ag horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is mucky silt loam or silt loam.

The Cg horizon has hue of 7.5YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is silt loam or mucky silt loam.

Nassawango Series

The soils of the Nassawango series are very deep and well drained. Permeability is moderate. These soils formed in silty eolian and alluvial deposits overlying sandy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Elevations are generally less than 25 feet. Slopes range from 0 to 5 percent.

Nassawango soils are similar to Matapeake soils and are commonly adjacent to Matapeake, Mattapex, and Othello soils. The Nassawango soils differ from Mattapex and Othello soils in not having redoximorphic features above a depth of 40 inches. They differ from Matapeake soils in having redoximorphic features above a depth of 72 inches.

Typical pedon of Nassawango silt loam, 0 to 2 percent slopes; on a smooth 0 percent slope, approximately 1.0 mile south of Basketswitch Road on Route 113, about 100 feet east, in a cultivated field:

Ap1—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable, slightly sticky; many fine and medium roots; many very fine, fine, and medium tubular pores; very strongly acid; abrupt smooth boundary.

Ap2—6 to 10 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable, slightly sticky; many fine and medium roots; many very fine vesicular and common fine and medium tubular pores; very strongly acid; clear smooth boundary.

E—10 to 14 inches; brownish yellow (10YR 6/6) silt loam; weak medium subangular blocky structure; friable, slightly sticky; many very fine and fine roots; common very fine, fine, and medium vesicular and tubular pores: strongly acid; clear smooth boundary.

Bt—14 to 30 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm, sticky, slightly plastic; common very fine and fine roots; common very fine, fine, and medium vesicular and tubular pores; distinct strong brown (7.5YR 5/8) clay films on faces of peds; very strongly acid; clear smooth boundary.

2Bt—30 to 36 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few fine roots; few very fine and fine irregular pores; extremely acid; clear smooth boundary.

2C1—36 to 43 inches; yellowish brown (10YR 5/6) loamy sand; few medium distinct light yellowish brown (10YR 6/4) mottles; massive; very friable; few very fine roots; extremely acid; clear wavy boundary.

2C2—43 to 50 inches; yellowish brown (10YR 5/6) sand; massive; loose; few very fine roots; few medium prominent light gray (10YR 7/1) irregularly shaped iron depletions; extremely acid; clear smooth boundary.

2C3—50 to 67 inches; brown (10YR 5/3) sand; single grain; loose; extremely acid; abrupt smooth boundary.

3Cg—67 to 80 inches; light gray (5Y 7/1) fine sandy loam; massive; firm; few coarse prominent strong brown (7.5YR 5/8) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 28 to 50 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas. The average clay content in the Bt horizon is 20 to 28 percent. The content of fine sand in the subsurface horizons and subsoil ranges to 15 percent in some areas.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It is silt loam or fine sandy loam.

The E horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is silt loam or silty clay loam.

The 2Bt horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. It is loam, fine sandy loam, or sandy loam.

The 2C horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 0 to 6. It is silt loam, fine sandy loam, loamy fine sand, loamy sand, or sand.

NnA—Nassawango fine sandy loam, 0 to 2 percent slopes

Composition

Nassawango soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None

Kind of water table: Perched
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mattapex soils in the slightly lower landform positions
- Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

NnB—Nassawango fine sandy loam, 2 to 5 percent slopes

Composition

Nassawango soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Fine sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Perched
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see Contents").

Inclusions

- Mattapex soils in the slightly lower landform positions
- Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

NsA—Nassawango silt loam, 0 to 2 percent slopes

Composition

Nassawango soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Perched
Available water capacity: High
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mattapex soils in the slightly lower landform positions
- Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

NsB—Nassawango silt loam, 2 to 5 percent slopes

Composition

Nassawango soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland. This unit mainly occurs along the northern side of the Pocomoke River from Nassawango Creek to Porters Crossing and in the Newark area.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Perched
Available water capacity: Very high
Note: In some areas, the content of fine sand may exceed 20 percent in the subsoil.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Mattapex soils in the slightly lower landform positions
- Matapeake soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Othello Series

The soils of the Othello series are very deep and poorly drained. Permeability is moderately slow. These soils formed in silty eolian or alluvial sediments overlying sandy fluviomarine sediments. They are on broad lowland flats of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Othello soils are similar to Elkton soils and are commonly adjacent to Elkton, Kentuck, and Mattapex soils. The Othello soils contain less clay in the B horizon than Elkton soils. They do not have the 10-inch-thick, black, highly organic surface layer that is typical of Kentuck soils. They differ from Mattapex soils in having redoximorphic features in the surface and subsurface layers.

Typical pedon of Othello silt loam; 0.5 mile north on River Road from Dividing Creek Road, 150 feet west, in low-lying woodland:

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine subangular blocky structure; very friable, slightly sticky, slightly plastic; many very fine, common fine and medium, and few coarse roots; many very fine, fine, and medium vesicular and tubular pores; very strongly acid; clear wavy boundary.

Eg—3 to 12 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, common fine, and few medium and coarse roots; common very fine, fine, and medium tubular pores; very strongly acid; gradual wavy boundary.

Btg1—12 to 28 inches; gray (10YR 6/1) silt loam; strong medium to coarse prismatic structure breaking to moderate medium subangular blocky; firm, sticky, plastic; many very fine, common fine, and few medium and coarse roots; common very fine and fine tubular pores; common medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; few distinct dark gray (5Y 4/2) clay films on faces of peds and lining soil pores; very strongly acid; gradual wavy boundary.

2Btg2—28 to 33 inches; gray (5Y 5/1) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, common medium, and few fine and coarse roots; few very fine and fine irregular pores; few medium prominent light olive brown (2.5Y 5/6) soft masses of iron accumulation; common distinct dark gray (5Y 4/2) clay bridging between grains; very strongly acid; clear wavy boundary.

2Cg1—33 to 36 inches; grayish brown (2.5Y 5/2) loamy sand; massive; very friable; common very fine and few fine and medium roots; few fine and medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

2Cg2—36 to 48 inches; gray (5Y 6/1) sand; single grain; loose; few very fine, fine, and medium roots;

few coarse light olive brown (2.5Y 5/6) soft masses of iron accumulation; very strongly acid; clear irregular boundary.

2Cg3—48 to 58 inches; grayish brown (2.5Y 5/2) sandy loam; massive; friable, slightly sticky; few fine roots; common medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; very strongly acid; gradual wavy boundary.

2Cg4—58 to 72 inches; light brownish gray (2.5Y 6/2) loamy sand; massive; very friable; very strongly acid.

The thickness of the solum ranges from 20 to 45 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. It is silt loam.

The Eg horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2. It is silt loam.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is silt loam or silty clay loam and has an average clay content of 18 to 27 percent in the particle-size control section.

The 2Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is sandy loam or sandy clay loam.

The 2Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It ranges from sand to sandy loam.

Ot—Othello silt loam

Composition

Othello soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: About half of the acreage of this map unit is woodland, and half is cropland. This unit mainly occurs on low-lying flats within the Pocomoke River basin. Extensive areas occur near the Timmonstown/Libertytown area.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Silty eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: In some areas this soil has buried surface layers at a depth of more than 60 inches.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Kentuck and Elkton soils in the slightly lower landform positions
- Mattapex and Nassawango soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Puckum Series

The soils of the Puckum series are very deep and very poorly drained. Permeability is moderately rapid. These soils formed in thick organic deposits derived from freshwater swamp vegetation overlying sandy alluvial sediments. They are located on wide flood plains of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Puckum soils are similar to Manahawkin soils and are commonly adjacent to Indiantown, Chicone, Mannington, Nanticoke, and Manahawkin soils. The Puckum soils differ from Indiantown, Mannington, and Nanticoke soils in having formed in organic soil materials. They differ from Chicone soils in not having a mineral overburden more than 16 inches thick. They differ from Manahawkin soils in having organic horizons more than 51 inches thick.

Typical pedon of Puckum mucky peat; on a smooth 0 percent slope, approximately 500 feet north of the Route 13 bridge along the Pocomoke River Nature Trail, on a wooded flood plain:

Oe—0 to 8 inches; very dark brown (7.5YR 2.5/2) mucky peat, hemic soil material; fiber content is two-thirds the soil volume after rubbing; many very fine, fine, and medium roots; strongly acid; clear wavy boundary.

Oa1—8 to 68 inches; strong brown (7.5YR 4/6) muck, hemic soil material; fiber content is one-sixth the soil volume after rubbing; common fine roots; strongly acid; gradual wavy boundary.

Oa2—68 to 74 inches; dark brown (7.5YR 3/2) muck, sapric soil material; fiber content is one-tenth the soil volume after rubbing; few very fine roots; strongly acid; abrupt wavy boundary.

A—74 to 80 inches; brown (7.5YR 4/4) mucky silt loam; massive; friable; *n* value greater than 1.0, material flows easily between fingers when squeezed; strongly acid.

The thickness of the organic deposits is greater than 51 inches. Reaction ranges from extremely acid to strongly acid. The electrical conductivity of the saturation extract is less than 4 millimhos per centimeter. Salinity typically is less than 2 parts per thousand. These soils are occasionally flooded by tidal fresh water and/or storm events.

The surface tier has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. It is mucky peat, peat, or muck.

The subsurface tier has hue of 10YR or 7.5YR, value of 2 to 4, and chroma of 0 to 4. It is mucky peat or muck.

The bottom tier has hue of 10YR or 7.5YR, value of 2 to 4, and chroma of 0 to 4. It is mucky peat or muck.

The A or Cg horizon, if it occurs, has hue of 7.5YR to 5Y, value of 2 to 6, and chroma of 1 to 4. It is mucky silt loam, silt loam, sandy loam, or loamy sand.

Pk—Puckum mucky peat

Composition

Puckum soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Swamps and flood plains
Slope: 0 to 1 percent
Note: All of the acreage of this map unit is wooded wetlands mainly along Nassawango Creek, Dividing Creek, and the Pocomoke River. Dominant vegetation is baldcypress, sweetgum, and red maple. The understory includes sweetbay, American holly, ferns, sedges, and mosses. These areas provide excellent habitat for wetland wildlife, including many birds, amphibians, reptiles, and small mammals. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Mucky peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic woody deposits
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Available water capacity: Very high
Note: Some areas of this soil south of Porters Crossing and near open water may be flooded twice daily by tides. Salinity ranges from 0 to 4 parts per thousand.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Manahawkin soils at similar elevations on flood plains
- Chicone soils at slightly higher elevations along the edge of the flood plain

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Purnell Series

The soils of the Purnell series are very deep and very poorly drained. Permeability is rapid. These soils formed in thin organic deposits derived from salt-tolerant vegetation overlying sandy marine and estuarine sediments. They are flooded twice daily by brackish tidal waters and are located in estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Purnell soils are similar to Boxiron soils and are commonly adjacent to Askesky, Brockatonorton, and Transquaking soils. The Purnell soils differ from Boxiron soils in not having more than 16 inches of organic material. They differ from Transquaking soils in having less than 51 inches of organic materials. They differ from Askesky and Brockatonorton soils in having formed in organic materials.

Typical pedon of Purnell peat; on a smooth 0 percent slope, approximately 1,200 feet east of the Verrazano Bridge on Assateague Island, 500 feet south, in a tidal marsh:

Oi—0 to 3 inches; dark brown (10YR 3/3) peat, fibric soil material; fiber content is three-fourths the soil volume after rubbing; many very fine and fine and common medium and coarse live roots; strongly saline; neutral; abrupt smooth boundary.

Oe—3 to 13 inches; dark grayish brown (2.5Y 3/2) mucky peat, hemic soil material; fiber content is one-half the soil volume after rubbing; common fine live roots; strongly saline; neutral; abrupt smooth boundary.

Cg1—13 to 18 inches; dark gray (5Y 4/1) sand; single grain; loose; common fine live roots; strongly saline; neutral; clear wavy boundary.

Cg2—18 to 40 inches; gray (5Y 6/1) sand; common medium faint gray (2.5Y 5/1) mottles; single grain; loose; strongly saline; neutral; gradual smooth boundary.

Cg3—40 to 72 inches; greenish gray (5GY 5/1) sand; massive; loose; moderately saline; neutral.

The combined thickness of the organic horizons ranges from 8 to 15 inches. Reaction ranges from neutral to moderately alkaline. The conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity is typically greater than 22 parts per thousand. If dredged, these soils have a moderate potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less.

The O horizon has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 0 to 3. It is peat or mucky peat.

The Cg horizon has hue of 10YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is sand or loamy sand.

Pu—Purnell peat

Composition

Purnell soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 1 percent
Note: All of the acreage of this map unit occurs in the bayside marshes of the barrier islands in Assawoman Bay and Chincoteague Bay. The dominant vegetation is saltmeadow cordgrass, saltmarsh cordgrass, saltgrass, sea lavender, and saltwort. These areas provide excellent habitat for tidal wetland wildlife, including habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds. On Assateague Island this unit is also frequently utilized by wild horses. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic deposits over sandy estuarine sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: High
Note: The erosion potential is highest along the edge of the marsh. If dredged, this soil has a moderate potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less. Salinity is commonly greater than 20 parts per thousand.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Askecksy and Brockatonorton soils at the slightly higher elevations in marshes

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

Rosedale Series

The soils of the Rosedale series are very deep and well drained. Permeability is moderate. These soils formed in sandy eolian and loamy fluviomarine sediments. They are located on uplands and ancient dunes of the mid-Atlantic Coastal Plain. Elevations are generally below 20 feet. Slopes range from 0 to 5 percent.

Rosedale soils are similar to Fort Mott soils and are commonly adjacent to Cedartown, Hambrook, Sassafras, and Woodstown soils. The Rosedale soils differ from Fort Mott soils in having redoximorphic features between depths of 48 and 72 inches. They differ from Woodstown soils in not having redoximorphic features above a depth of 40 inches. They differ from Cedartown, Hambrook, and Sassafras soils in having more than 20 inches of sandy material above the subsoil.

Typical pedon of Rosedale loamy sand, 0 to 2 percent slopes; approximately 2.5 miles east of Stockton on George Island Landing Road, 25 feet north of the road, in a cultivated field:

Ap—0 to 10 inches; grayish brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.

E—10 to 15 inches; yellowish brown (10YR 5/4) loamy sand; weak very fine subangular blocky structure; very friable; many very fine and fine roots; strongly acid; clear smooth boundary.

BE—15 to 22 inches; yellowish brown (10YR 5/6) loamy sand; weak fine subangular blocky structure; very friable; many very fine and fine roots; strongly acid; clear smooth boundary.

Bt—22 to 38 inches; strong brown (7.5YR 5/8) loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; few fine and medium irregular pores; strongly acid; gradual smooth boundary.

C—38 to 58 inches; strong brown (7.5YR 5/8) sand; single grain; loose; common very fine and fine roots; strongly acid; clear smooth boundary.

Cg1—58 to 66 inches; grayish brown (2.5Y 5/2) silt loam; massive; friable; few very fine roots; common fine distinct yellowish brown (10YR 5/8) soft masses of iron accumulation and few medium faint light brownish gray (2.5Y 6/2) irregularly shaped iron depletions; extremely acid; clear smooth boundary.

Cg2—66 to 72 inches; light gray (2.5Y 6/1) sand; massive; loose; common medium faint pale brown (10YR 6/3) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 30 to 48 inches. Drainage mottles typically occur between depths of 42 and 72 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is loamy sand or sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, loam, or sandy clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 8. It is loamy sand or sand.

The Cg horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 3. It is silt loam or fine sandy loam. In some pedons these textures may occur below a depth of 72 inches. In many pedons sand and loamy sand occur directly below finer textured layers.

RoA—Rosedale loamy sand, 0 to 2 percent slopes

Composition

Rosedale soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland, and the remainder is woodland.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Well drained
Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Elevations are generally below 25 feet. This map unit most commonly occurs in the Pocomoke State Forest area and east of the sea escarpment.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Fort Mott, Galestown, and Sassafras soils in the slightly higher landform positions
- Cedartown and Runclint soils in landform positions similar to those of the Rosedale soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

RoB—Rosedale loamy sand, 2 to 5 percent slopes

Composition

Rosedale soil and similar soils: 80 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this unit is cropland, and the remainder is woodland.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Well drained

Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: Elevations are generally below 25 feet. This map unit most commonly occurs in the Pocomoke State Forest area and east of the sea escarpment.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown and Runclint soils in landform positions similar to those of the Rosedale soil
- Fort Mott, Galestown, and Sassafras soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Runclint Series

The soils of the Runclint series are very deep and well drained. Permeability is rapid. These soils formed in sandy eolian and fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 10 percent.

Runclint soils are similar to Evesboro soils and are commonly adjacent to Evesboro, Klej, Cedartown, Rosedale, and Fort Mott soils. The Runclint soils differ from Evesboro and Fort Mott soils in having redoximorphic features between depths of 48 and 72 inches. They differ from Klej soils in not having redoximorphic features above a depth of 40 inches. They differ from Cedartown and Rosedale soils in not having a loamy subsoil.

Typical pedon of Runclint loamy sand, 0 to 2 percent slopes; approximately 1/2 mile west of the intersection of Holly Swamp Road and Redden Road, 100 feet north, in woodland:

A—0 to 10 inches; grayish brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear smooth boundary.
BE—10 to 18 inches; yellowish brown (10YR 5/6) loamy sand; single grain; very friable; many very fine and fine roots; strongly acid; clear smooth boundary.
Bw1—18 to 32 inches; yellowish brown (10YR 5/6) loamy sand; weak fine subangular blocky structure; very friable; common very fine and fine roots; strongly acid; gradual smooth boundary.
Bw2—32 to 42 inches; yellowish brown (10YR 5/6) loamy sand; common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; very friable; common very fine and fine roots; strongly acid; clear smooth boundary.
C1—42 to 48 inches; pale olive brown (2.5Y 6/3) loamy sand; common fine distinct light olive brown (2.5Y 5/6) mottles; massive; loose; few fine roots; extremely acid; clear smooth boundary.
C2—48 to 66 inches; pale olive brown (2.5Y 5/3) sand; common medium distinct light olive brown (2.5Y 5/6) mottles; massive; loose; extremely acid; gradual wavy boundary.
C3—66 to 72 inches; yellowish brown (10YR 5/6) sandy loam; massive; loose; common medium prominent light brownish gray (2.5Y 6/2) irregularly shaped iron depletions and common medium distinct strong brown (7.5YR 5/8) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 30 to 50 inches. The gravel content ranges from 0 to 5 percent in the solum and from 0 to 15 percent in the substratum. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is loamy sand or sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is loamy sand or sand.

The Bw horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sand or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is loamy sand or sand. Many pedons have layers of sandy loam below a depth of 72 inches.

RuA—Runclint loamy sand, 0 to 2 percent slopes

Composition

Runclint soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent

Note: Most of the acreage of this unit is cropland, and the remainder is woodland.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Elevations are generally below 25 feet. This map unit most commonly occurs in the Pocomoke State Forest area and east of the sea escarpment.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown and Rosedale soils in landform positions similar to those of the Runclint soil
- Klej and Hammonton soils in the slightly lower landform positions
- Evesboro and Galestown soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

RuB—Runclint loamy sand, 2 to 5 percent slopes

Composition

Runclint soil and similar soils: 25 percent
Inclusions: 20 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this unit is cropland, and the remainder is woodland.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Dominant parent material: Sandy eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Elevations are generally below 25 feet. This map unit most commonly occurs in the Pocomoke State Forest area and east of the sea escarpment.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Cedartown and Rosedale soils in landform positions similar to those of the Runclint soil
- Klej and Hammonton soils in the slightly lower landform positions
- Evesboro and Galestown soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Sassafras Series

The soils of the Sassafras series are very deep and well drained. Permeability is moderate. These soils formed in loamy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 10 percent.

Sassafras soils are similar to Fort Mott soils and are commonly adjacent to Evesboro, Fort Mott, Galestown, Hambrook, and Woodstown soils. The Sassafras soils differ from Evesboro and Galestown soils in having more clay in the B horizon. They differ from Fort Mott soils in having more clay in the surface and subsurface horizons. They differ from Woodstown soils in not having redoximorphic features above a depth of 40 inches. They differ from Hambrook soils in not having redoximorphic features between depths of 48 and 72 inches.

Typical pedon of Sassafras sandy loam, 0 to 2 percent slopes; on a smooth 0 percent slope, approximately 300 feet east of Sand Road on Creek Road, 50 feet north, in woodland adjacent to Nassawango Creek:

A—0 to 4 inches; dark brown (10YR 3/3) sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; few very fine and fine irregular pores; neutral; abrupt smooth boundary.
E—4 to 15 inches; yellowish brown (10YR 5/4) sandy

loam; weak medium subangular blocky structure; friable; many very fine and fine roots; few very fine and fine irregular pores; moderately acid; clear smooth boundary.

Bt—15 to 30 inches; strong brown (7.5YR 4/6) loam; moderate medium subangular blocky structure; friable, slightly sticky; common very fine and fine roots; few fine and common medium vesicular and irregular pores; common distinct strong brown (7.5YR 5/8) clay films on faces of peds; strongly acid; gradual smooth boundary.

BC—30 to 37 inches; strong brown (7.5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few very fine and fine roots; strongly acid; clear smooth boundary.

C1—37 to 43 inches; strong brown (7.5YR 5/6) loamy sand; massive; loose; few fine roots; extremely acid; clear smooth boundary.

C2—43 to 55 inches; brownish yellow (10YR 6/6) sand; few medium distinct light yellowish brown (2.5Y 6/3) mottles; single grain; loose; few very fine roots; extremely acid; gradual smooth boundary.

C3—55 to 80 inches; yellow (10YR 7/6) sand; single grain; loose; few fine distinct black (N 2/0) manganese concretions; extremely acid.

The thickness of the solum ranges from 25 to 40 inches. Reaction ranges from extremely to strongly acid in unlimed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam or loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam, sandy loam, or loam. The average clay content is between 18 and 27 percent.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. It is loamy sand or sand.

SaA—Sassafras sandy loam, 0 to 2 percent slopes

Composition

Sassafras soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland. Some small areas are woodland. This unit occurs in areas scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Fort Mott and Galestown soils in landform positions similar to those of the Sassafras soil
- Woodstown and Hambrook soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

SaB—Sassafras sandy loam, 2 to 5 percent slopes

Composition

Sassafras soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats and knolls
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland. Some small areas are woodland. This unit occurs in areas scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments

Flooding: None
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Fort Mott and Galestown soils in landform positions similar to those of the Sassafras soil
- Woodstown and Hambrook soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

SaC—Sassafras sandy loam, 5 to 10 percent slopes

Composition

Sassafras soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Stream terraces and side slopes
Slope: 5 to 10 percent
Note: Most of the acreage of this map unit is woodland. This unit mainly occurs adjacent to drainageways scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments
Flooding: None
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Indiantown and Zekiah soils at the toe of slopes along drainageways
- Galestown soils in landform positions similar to those of the Sassafras soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Sunken Series

The soils of the Sunken series are very deep and poorly drained. Permeability is moderately slow. These soils formed in silty eolian or alluvial sediments overlying sandy fluviomarine sediments. They are in slightly elevated areas scattered throughout estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes range from 0 to 2 percent.

Sunken soils are similar to Othello soils and are commonly adjacent to Broadkill, Boxiron, Mispillion, and Transquaking soils. The Sunken soils differ from Broadkill soils in having *n* values of less than 1.0 in the subsoil. They differ from Boxiron, Mispillion, and Transquaking soils in not having formed in organic deposits. They differ from Othello soils in having higher base saturation due to the influence of saltwater tides.

Typical pedon of Sunken mucky silt loam; approximately 0.5 mile south of Snug Harbor Trailer Park, in an elevated area within the tidal marsh:

Ag—0 to 9 inches; dark grayish brown (10YR 3/2) mucky silt loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; many very fine, common fine, and few medium and coarse roots; common very fine, fine, and medium tubular pores; strongly saline; neutral; gradual wavy boundary.

Btg1—9 to 23 inches; gray (10YR 6/1) silt loam; strong medium to coarse prismatic structure breaking to moderate medium subangular blocky; firm, sticky, plastic; many very fine, common fine, and few medium and coarse roots; common very fine and fine tubular pores; common medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; few distinct dark gray (5Y 4/2) clay films on faces of peds and lining soil pores; strongly saline; neutral; gradual wavy boundary.

2Btg2—23 to 28 inches; greenish gray (5GY 5/1) silt loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; *n* value of 0.9, material flows with little difficulty between fingers when squeezed; few fine and coarse roots; few very fine and fine irregular pores; few medium prominent light olive brown (2.5Y 5/6) soft masses of iron accumulation; common distinct dark gray (5Y 4/2) clay bridging between grains; strongly saline; neutral; clear wavy boundary.

2Cg1—28 to 45 inches; greenish gray (5GY 5/2) silt loam; massive; very friable, slightly sticky; *n* value greater than 1.0, material flows easily between fingers when squeezed; few fine and medium prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; strongly saline; slightly alkaline; clear wavy boundary.

2Cg2—45 to 72 inches; gray (5GY 6/1) silt loam; massive; friable, slightly sticky; few coarse light olive brown (2.5Y 5/6) soft masses of iron accumulation; strongly saline; neutral.

The thickness of the solum ranges from 20 to 45 inches. Reaction ranges from slightly acid to slightly alkaline. The electrical conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity is typically greater than 15 parts per thousand. These soils are flooded during extreme high tides and storm events.

The Oe horizon, if it occurs, has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. It is mucky peat.

The Ag horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. It is silt loam.

The Eg horizon, if it occurs, has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2. It is silt loam.

The Btg horizon has hue of 10YR to 5GY, value of 5 to 7, and chroma of 1 or 2. It is silt loam or silty clay loam.

The 2Btg horizon has hue of 10YR to 5GY, value of 4 to 6, and chroma of 1 or 2. It is silt loam or silty clay loam.

The 2Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It is silt loam or silty clay loam.

Su—Sunken mucky silt loam

Composition

Sunken soil and similar soils: 100 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 1 percent
Note: All of the acreage of this map unit occurs as small elevated areas scattered throughout tidal marshes in Assawoman and Chincoteague Bays. The dominant vegetation is pine trees, phragmites, saltmeadow cordgrass, saltmarsh cordgrass, and saltgrass. These areas provide excellent habitat for tidal wetland wildlife, including habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds.

Component Description

Surface layer texture: Mucky silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Silty estuarine sediments
Flooding: Occasional
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: High
Note: Elevations generally range from 1 to 3 feet.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Boxiron, Broadkill, Mispillion, and Transquaking soils in adjacent tidal marshes

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Transquaking Series

The soils of the Transquaking series are very deep and very poorly drained. Permeability is moderately rapid. These soils formed in thick organic deposits derived from salt-tolerant vegetation overlying loamy marine and estuarine sediments. They are flooded twice daily by brackish tidal waters and are located in estuarine and coastal tidal marshes of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Transquaking soils are similar to Mispillion soils and are commonly adjacent to Boxiron, Mispillion, and Sunken soils. The Transquaking soils differ from Boxiron and Sunken soils in having more than 16 inches of organic material. They differ from Mispillion soils in having more than 51 inches of organic materials.

Typical pedon of Transquaking mucky peat; on a smooth 0 percent slope, 1,400 feet south of Snug Harbor trailer park, in a mainland tidal marsh of Sinepuxent Bay:

Oi—0 to 6 inches; dark brown (10YR 3/3) mucky peat, hemic soil material; fiber content is one-half the soil volume after rubbing; 40 percent silt loam mineral material; many very fine and fine and common medium and coarse live roots; strongly saline; neutral; clear wavy boundary.

Oe1—6 to 19 inches; dark brown (7.5YR 3/2) mucky peat, hemic soil material; fiber content is one-third the soil volume after rubbing; 40 percent silt loam mineral material; common very fine and fine live roots; strongly saline; moderately alkaline; abrupt smooth boundary.

Oe2—19 to 28 inches; very dark grayish brown (10YR 3/2) mucky peat, hemic soil material; fiber content is one-fifth the soil volume after rubbing; 60 percent silt loam mineral material; few fine live roots; strongly saline; moderately alkaline; clear smooth boundary.

Oe3—28 to 48 inches; dark brown (7.5YR 3/2) and very dark brown (10YR 2/2) mucky peat, hemic soil material; fiber content is one-fifth the soil volume after rubbing; 25 percent silt loam mineral material; strongly saline; moderately alkaline; gradual wavy boundary.

Oa—48 to 66 inches; very dark grayish brown (10YR 3/2) muck, sapric soil material; fiber content is one-tenth the soil volume after rubbing; 25 percent silt loam mineral material; strongly saline; slightly alkaline; clear smooth boundary.

Ag—66 to 72 inches; very dark brown (10YR 2/2) mucky loam; massive; friable, slightly sticky; *n* value of 0.9, material flows with little difficulty between fingers when squeezed; strongly saline; slightly alkaline; abrupt smooth boundary.

Cg—72 to 80 inches; gray (5Y 5/1) sandy clay loam; massive; friable, slightly sticky, slightly plastic; *n* value of 0.8, material flows with some difficulty between fingers when squeezed; strongly saline; neutral.

The combined thickness of the organic horizons is greater than 51 inches. Reaction ranges from neutral to moderately alkaline. The electrical conductivity of the saturation extract is greater than 16 millimhos per centimeter. Salinity is typically greater than 22 parts per thousand. The *n* value of the mineral horizons is commonly greater than 0.8. Thin layers of silt loam mineral material having a combined thickness of less than 4 inches sometimes occur within the organic horizons. If dredged, these soils have a moderate potential to undergo acid-sulfate weathering, which results in soil pH of 4.0 or less.

The surface tier has hue of 5YR to 10YR, value of 2 to 4, and chroma of 2 to 6. It is peat or mucky peat. The mineral content ranges from 20 to 60 percent.

The subsurface tier has hue of 7.5YR to 10YR, value of 2 to 4, and chroma of 1 to 4. It is peat or mucky peat. The mineral content ranges from 35 to 70 percent.

The bottom tier has hue of 7.5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. It is mucky peat or muck. The mineral content ranges from 20 to 75 percent.

The Ag horizon, if it occurs, has hue of 10YR, value of 2 or 3, and chroma of 1 to 3 or is neutral in hue and has value of 2 or 3. It is mucky loam, mucky silt loam, loam, or silt loam.

The Cg horizon has hue of 10YR to 5GY, value of 3 to 6, and chroma of 0 to 2. It is sandy clay loam, silt loam, or silty clay loam. In some pedons it has thin subhorizons of organic material.

Tk—Transquaking mucky peat

Composition

Transquaking soil and similar soils: 90 percent
Inclusions: 5 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 1 percent
Note: Most of the acreage of this map unit is in areas of Sinepuxent and Chincoteague Bays. The dominant vegetation is saltmeadow cordgrass, saltmarsh cordgrass, saltgrass, sea lavender, and saltwort. These areas provide excellent habitat for tidal wetland wildlife, including habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Mucky peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic herbaceous deposits
Flooding: Frequent
Kind of water table: Apparent
Ponding: Very long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: Very high
Note: The erosion potential is highest along the edge of the marsh. If dredged, this soil has a moderate potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less. Salinity is typically greater than 20 parts per thousand.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Mispillion soils in landform positions similar to those of the Transquaking soil

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

TP—Transquaking and Mispillion soils

Composition

Transquaking soil and similar soils: 55 percent
Mispillion soil and similar soils: 35 percent
Inclusions: 10 percent

Setting

Landform: Estuarine tidal marshes
Slope: 0 to 1 percent
Note: Most of the acreage of this map unit occurs in mainland tidal marshes of Sinepuxent and Chincoteague Bays. The dominant vegetation is saltmeadow cordgrass, saltmarsh cordgrass, saltgrass, sea lavender, and saltwort. These areas provide excellent habitat for tidal wetland wildlife, including habitat for the feeding and nesting of crabs, small mammals, amphibians, reptiles, and birds. The soils are a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Transquaking

Surface layer texture: Peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic herbaceous deposits
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: Very high
Note: The erosion potential is highest along the edge of the marsh. If dredged, this soil has a moderate potential to undergo acid-sulfate weathering, which results in a soil pH of 4.0 or less. Salinity is typically greater than 20 parts per thousand.

Mispillion

Surface layer texture: Peat
Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Dominant parent material: Organic deposits over silty estuarine sediments
Flooding: Frequent
Kind of water table: Apparent
Ponding: Long in duration
Salt affected: Saline within a depth of 30 inches
Available water capacity: Very high

A typical description of each soil is included in this section. Additional information specific to the soils of this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Boxiron and Broadkill soils in landform positions similar to those of the Transquaking and Mispillion soils

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Uc—Urban land-Acquango complex

Composition

Urban land: 55 percent
Acquango soil and similar soils: 35 percent
Inclusions: 10 percent

Setting

Landform: Dunes
Slope: 0 to 2 percent
Note: All of the acreage of this map unit occurs on the barrier islands. It is composed of paved areas, buildings, and natural soil areas. Vegetated areas provide excellent habitat for shoreline wildlife. Dominant vegetation is American beachgrass, panicgrass, and other salt-tolerant plants.

Component Description

Urban land

Urban land consists of areas where much of the soil surface is covered with asphalt, concrete, buildings, or other impervious material.

Acquango

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Flooding: Occasional
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: Some dune areas of this map unit have been restored using earthmoving equipment and/or other alternative means, such as sand fences and hay bales. This map unit is subject to severe scouring and erosion due to intense wave action during winter "northeasters" and tropical storms in summer and fall. Salinity ranges from 0 to 4 parts per thousand.

A typical description of the Acquango soil is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Brockatonorton soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Um—Urban land-Askecksy complex

Composition

Urban land: 45 percent
Askecksy soil and similar soils: 35 percent

Setting

Landform: Lowland flats and depressions
Slope: 0 to 2 percent
Note: All of the acreage of this map unit occurs on the bayside area of barrier islands. It is composed of paved areas, buildings, and natural soil areas. The soil may be affected by salt spray and is occasionally flooded by high tides of brackish water during storm events. Due to the soil's higher salinity levels, the vegetation may consist entirely of salt-tolerant plants.

Component Description

Urban land

Urban land consists of areas where much of the soil surface is covered with asphalt, concrete, buildings, or other impervious material.

Askecksy

Surface layer texture: Loamy sand
Depth class: Very deep (72 inches)
Drainage class: Poorly drained
Flooding: None
Kind of water table: Apparent
Available water capacity: Low
Note: Salinity ranges from 0 to 4 parts per thousand.

A typical description of the Askecksy soil is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Brockatonorton soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Un—Urban land-Brockatonorton complex

Composition

Urban land: 40 percent
Brockatonorton soil and similar soils: 40 percent
Inclusions: 20 percent

Setting

Landform: Backshores
Slope: 0 to 2 percent
Note: All of the acreage of this map unit occurs on the barrier islands. It is composed of paved areas, buildings, and natural soil areas. Vegetated areas provide excellent habitat for shoreline wildlife. Dominant vegetation is bayberry, salt myrtle, shore juniper, searocket, and seaside goldenrod.

Component Description

Urban land

Urban land consists of areas where much of the soil surface is covered with asphalt, concrete, buildings, or other impervious material.

Brockatonorton

Surface layer texture: Sand
Depth class: Very deep (more than 60 inches)

Drainage class: Moderately well drained
Flooding: Occasional
Kind of water table: Apparent
Salt affected: Saline within a depth of 30 inches
Available water capacity: Low
Note: The soil's organic layer is a result of the burial of prior bayside marshes by the landward migration of the barrier island. Salinity ranges from 0 to 4 parts per thousand.

A typical description of the Brockatonorton soil is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

- Askecksy soils in the slightly lower landform positions
- Acquango soils in the slightly higher landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Ur—Urban land

Composition

Urban land: 90 percent
Inclusions: 10 percent

Setting

Slope: 0 to 2 percent
Note: This map unit may have some small scattered areas of soil that support vegetation.

Component Description

This map unit consists of areas where much of the soil surface is covered with asphalt, concrete, buildings, or other impervious material.

Inclusions

- Unnamed natural and manmade soils

Ut—Urban land-Udorthents complex

Composition

Urban land: 54 percent
Udorthents and similar soils: 44 percent
Inclusions: 2 percent

Setting

Slope: 0 to 2 percent

Component Description

Urban land

Urban land consists of areas where much of the soil surface is covered with asphalt, concrete, buildings, or other impervious material.

Udorthents

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: The soil material within this map unit has been moved, filled in, or worked by machinery. Most of the soil areas have been reshaped and leveled.

Inclusions

- Unnamed natural and manmade soils

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Uz—Udorthents

Composition

Udorthents and similar soils: 85 percent
Inclusions: 15 percent

Setting

Slope: 0 to 2 percent
Note: All of the acreage of this map unit occurs in developed areas of towns, borrow pits, and landfills scattered throughout the county.

Component Description

Surface layer texture: Loamy sand
Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate
Note: The soil material within this map unit has been moved, filled in, or worked by machinery. Most of the soil areas have been reshaped and leveled. In areas of landfills, garbage content may be significant in the soil profile. In areas of borrow

pits, excavations may extend into the underlying geologic material. In the coastal region, old tidal marsh soils commonly underlie the surficial fill material.

Inclusions

- Unnamed natural and manmade soils

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Woodstown Series

The soils of the Woodstown series are very deep and moderately well drained. Permeability is moderate. These soils formed in loamy fluviomarine sediments. They are located on uplands of the mid-Atlantic Coastal Plain. Slopes range from 0 to 5 percent.

Woodstown soils are similar to Sassafras soils and are commonly adjacent to Hambrook, Fort Mott, Fallsington, and Sassafras soils. The Woodstown soils differ from Fallsington soils in not having redoximorphic features in the surface and subsurface horizons. They differ from Fort Mott soils in having more clay in the surface and subsurface horizons and in being moderately well drained. They differ from Hambrook and Sassafras soils in having redoximorphic features above a depth of 40 inches.

Typical pedon of Woodstown sandy loam, 0 to 2 percent slopes; approximately 1,000 feet south of Stagg Creek, 1,000 feet northwest, in a cultivated field:

Ap—0 to 10 inches; dark brown (10YR 3/3) sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; common very fine and fine irregular pores; neutral; abrupt smooth boundary.

E—10 to 14 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; many very fine and fine roots; few very fine and fine irregular pores; moderately acid; clear smooth boundary.

Bt1—14 to 32 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; common very fine and fine roots; common very fine and fine vesicular and few medium tubular pores; common distinct strong brown (7.5YR 4/6) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—32 to 38 inches; light olive brown (2.5Y 5/6) sandy loam; moderate medium subangular blocky structure; friable, slightly sticky, slightly plastic; few very fine and fine roots; common fine vesicular and common fine tubular pores; common medium distinct light brownish gray (10YR 6/2) irregularly shaped iron depletions and few fine distinct strong brown (7.5YR 5/8) soft masses of iron accumulation; few faint yellowish brown (10YR 5/6) clay films on faces of peds; strongly acid; gradual smooth boundary.

BC—38 to 48 inches; light yellowish brown (2.5Y 6/3) loamy sand; weak medium subangular blocky structure; friable; common medium grayish brown (2.5Y 6/1) iron depletions; strongly acid; clear smooth boundary.

C—48 to 72 inches; light brownish gray (2.5Y 6/2) loamy sand; massive; loose; few fine prominent strong brown (7.5YR 5/8) and common coarse prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; extremely acid.

The thickness of the solum ranges from 30 to 50 inches. Reaction ranges from extremely acid to strongly acid in unlimed areas and from moderately acid to neutral in limed areas.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam or loamy sand. The content of fragments ranges from 0 to 5 percent.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or loamy sand. The content of fragments ranges from 0 to 5 percent.

The Bt horizon has hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam, sandy loam, or loam. The average clay content is between 18 and 27 percent.

The BC horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 0 to 4. It is loamy sand or sand.

WdA—Woodstown sandy loam, 0 to 2 percent slopes

Composition

Woodstown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, lowland flats, and shallow depressions

Slope: 0 to 2 percent
Note: Most of the acreage of this map unit is cropland. Some small areas are woodland. This unit occurs in areas scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Loamy fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Sassafras, Hambrook, Rosedale, and Fort Mott soils in the slightly higher landform positions
• Klej and Hammonton soils in landform positions similar to those of the Woodstown soil
• Fallsington and Hurlock soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

WdB—Woodstown sandy loam, 2 to 5 percent slopes

Composition

Woodstown soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Upland flats, lowland flats, and shallow depressions
Slope: 2 to 5 percent
Note: Most of the acreage of this map unit is cropland. Some small areas are woodland. This unit occurs in areas scattered throughout the county.

Component Description

Surface layer texture: Sandy loam
Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Dominant parent material: Loamy eolian deposits and/or fluviomarine sediments
Flooding: None
Kind of water table: Apparent
Available water capacity: Moderate

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see "Contents").

Inclusions

• Sassafras, Hambrook, Rosedale, and Fort Mott soils in the slightly higher landform positions
• Klej and Hammonton soils in landform positions similar to those of the Woodstown soil
• Fallsington and Hurlock soils in the slightly lower landform positions

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

Zekiah Series

The soils of the Zekiah series are very deep and poorly drained. Permeability is moderate. These soils formed in loamy alluvial deposits overlying sandy alluvial and marine sediments. They are located on thin flood plains of the mid-Atlantic Coastal Plain. Slopes are 0 to 1 percent.

Zekiah soils are similar to Indiantown soils and are commonly adjacent to Indiantown, Manahawkin, Puckum, Galestown, and Evesboro soils. The Zekiah soils differ from Indiantown soils in not having a thick black surface horizon. They differ from Manahawkin and Puckum soils in not having formed in organic soil material. They differ from Galestown and Evesboro soils in being occasionally flooded and having redoximorphic features above a depth of 72 inches.

Typical pedon of Zekiah silt loam; on a smooth 0 percent slope, 200 feet north of Boxiron Road adjacent to Boxiron Creek, on a wooded flood plain:

A—0 to 3 inches; dark brown (7.5YR 3/2) silt loam; weak fine granular structure; friable, slightly sticky; many very fine and fine and common medium roots; many very fine and fine vesicular and common very fine tubular pores; very strongly acid; abrupt wavy boundary.
Cg—3 to 20 inches; dark grayish brown (10YR 4/2) silt

loam; weak medium platy structure; friable; common very fine and fine roots; common medium prominent dark reddish brown (5YR 3/3) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

2Ab—20 to 27 inches; very dark gray (10YR 3/1) sandy loam; massive; friable; few fine roots; common medium prominent dark brown (7.5YR 3/4) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

2Cg1—27 to 37 inches; dark grayish brown (2.5Y 4/2) sandy loam; few medium gray (10YR 5/1) lenses of sand; massive; friable, slightly sticky; few medium prominent dark brownish yellow (10YR 4/6) soft masses of iron accumulation; common coarse distinct grayish brown (10YR 3/2) organic stains; very strongly acid; clear wavy boundary.

2Cg2—37 to 50 inches; bluish gray (5B 5/1) loam; massive; friable, slightly sticky; few medium prominent strong brown (7.5YR 5/8) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

2Cg3—50 to 72 inches; stratified grayish brown (2.5Y 5/2) sand and loamy sand; single grain; loose; common medium distinct dark grayish brown (10YR 4/2) organic stains; very strongly acid.

The combined thickness of the A and C horizons is greater than 72 inches. Depth to the buried surface layer ranges from 18 to 45 inches. Organic staining commonly occurs in the 2Cg horizon. Reaction ranges from extremely acid to strongly acid in all horizons. These soils are occasionally flooded during storm events.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 to 3. It is mucky silt loam, mucky loam, silt loam, or loam.

The Cg horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 0 to 2. It is sand, loamy sand, sandy loam, or silt loam.

The 2Ab horizon has hue of 2.5Y or 10YR, value of 3 to 6, and chroma of 0 to 2. It is mucky loam, loam, or sandy loam.

The 2Cg horizon has hue of 10YR to 5B, value of 3 to 7, and chroma of 1 to 3. It is loam, sandy loam, loamy sand, or sand. Organic staining and stratification occur within this horizon.

Zk—Zekiah silt loam

Composition

Zekiah soil and similar soils: 75 percent
Inclusions: 25 percent

Setting

Landform: Flood plains
Slope: 0 to 1 percent
Note: All of the acreage of this map unit is wooded wetlands along streams throughout the county. Dominant vegetation is baldcypress, sweetgum, and red maple. The understory includes sweetbay, American holly, ferns, sedges, and mosses. These areas provide excellent habitat for wetland wildlife, including many birds, amphibians, reptiles, and small mammals. The soil is a valuable storage medium for the retention of nutrients, floodwaters, sediment, and chemical pollutants.

Component Description

Surface layer texture: Silt loam
Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Dominant parent material: Loamy alluvial sediments
Flooding: Frequent
Kind of water table: Apparent
Available water capacity: Moderate
Note: This soil commonly has buried surface layers due to depositional events. Organic staining and stratification are also common.

A typical soil description is included in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the appropriate table of this publication (see “Contents”).

Inclusions

- Indiantown soils at the slightly lower elevations on flood plains
- Active streams

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as 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.

Generally, the soils in Worcester County that are well suited to crops are also well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

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

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

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

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Natural Resources Conservation Service is explained, the estimated yields of the main crops and hay and pasture plants are listed for each soil, 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" and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

In 1992, about 85,000 acres in Worcester County were used for crop production. Field crops suited to the soils and climate of the county include grain corn, soybeans, wheat, and sorghum. Specialty crops produced in the county include sweet corn, tomatoes, potatoes, cucumbers, string beans, squash, and pumpkins. The majority of these crops are produced for sale at roadside stands.

The latest information about the production of row and truck crops can be obtained from the local office of the Maryland Cooperative Extension Service or the Natural Resources Conservation Service.

Drainage.—Improving and/or maintaining drainage is a high priority in managing the soils for crop production. More than 50,000 acres in Worcester County require improved drainage to produce crops. Extensive drainage systems installed from the 1940's to the 1960's allowed farmers to bring more land into production and make cultivation of seasonally wet soils much easier, especially in spring. During the past 15 years, growing environmental awareness of the value of wetlands has dramatically decreased construction of new drainage ditches. Recent state and federal programs now encourage construction of new wetlands and protection of existing wetlands. Drainage, however, remains an important component of farm management, and the degree of drainage limitation is directly related to soil type.

Well drained soils, such as Hambrook, Matapeake, and Sassafras soils, are not limited by drainage problems. Moderately well drained soils, such as Klej, Mattapex, and Woodstown soils, may be limited by a seasonal high water table during spring planting or late fall harvesting. Poorly drained and very poorly drained soils, such as Fallsington, Othello, Kentuck, Elkton, and Mullica soils, have severe limitations unless drained. The main management concern on these soils is providing an outlet for surface and subsurface drainage. Most cropland areas of poorly drained and very poorly drained soils have extensive drainage systems. Some areas may also have subsurface tile drains in addition to field ditches. Regardless of the type of system installed, it is imperative that periodic maintenance be performed to make sure that the systems function adequately so that crop yields can be maximized.

Managing drainage in conformance with regulations concerning wetlands may require special permits and extra planning. The local office of the Natural Resources Conservation Service should be contacted for identification of hydric soils and potential wetlands.

Soil amendments.—Most of the soils in Worcester County are naturally acidic. In addition, natural soil fertility levels are generally low or very low after land is initially converted from woodland to cropland. For these reasons, additions of lime and fertilizer are needed for crop production.

In the past few years, concern over nutrient enrichment of Chesapeake Bay and the widespread use of poultry manure as a fertilizer has led to a greater awareness of the impact of fertilizer amendments on the local environment. Soils that are regularly cultivated become severely deficient in nitrogen, phosphorus, and potassium if these elements are not applied as amendments. Some soils also require additions of micronutrients, such as boron, manganese, sulfur, and zinc. For many years, amendments to the soils of Worcester County have included both commercial fertilizers and poultry manure. Soil tests indicate that many of the cultivated soils in the county now have extremely high background levels of phosphorus. Although nitrogen-based management has been in place for more than a decade, it has only been in the past few years that more emphasis is being placed on managing for soil phosphorus. The amount of manure and/or commercial fertilizer applied is adjusted according to the crop being grown.

Measures that are effective in maintaining soil fertility and protecting the environment include applying fertilizer and manure according to the results of soil tests and using cover crops in crop rotations. Because phosphorus, unlike nitrogen, becomes attached to soil particles, controlling erosion is essential. Taking highly erodible soils out of production and establishing filter strips adjacent to ditches and buffer strips along wetlands and streams help to protect the environment and maintain productivity.

Irrigation.—Annual rainfall in Worcester County is sufficient for agriculture, but it is not always distributed adequately during the growing season. Extended dry spells are not uncommon between June and September. In addition, tropical storms sometimes bring in excessive amounts of rain and damage crops.

To effectively counter extended dry periods, irrigation is used extensively on the Delmarva Peninsula. If an adequate water supply is available, irrigation can maintain crops through periods of drought. In Worcester County, about 1,800 acres are presently irrigated. This acreage, however, is expected to increase significantly over the next decade because of the impact of recent droughts on farm operations.

The type of crop being grown and soil characteristics help to determine the amount and rate at which irrigation water is applied. Generally, soils with a low water-holding capacity and/or sandy surface layers (such as Evesboro, Galestown, Fort Mott, and Cedartown soils) can benefit the most from irrigation. The main management concerns on irrigated soils are efficient and timely water use, reduction of evaporation and runoff rates, and erosion control. Conservation practices, such as conservation tillage, field windbreaks, and crop residue left on the soil surface, help in efficiently managing irrigation systems.

Erosion control.—About 8 percent of the soils in Worcester County are subject to erosion by wind or water. Loss of the surface layer through erosion can be very damaging to crop production and to the local environment. Nutrients and organic matter essential to crop production can be lost, and infiltration of water into the soil can be greatly reduced. The greater the erosion, the more negative the impact on crop production. Soil erosion can also lead to the sedimentation of ditches, streams, and rivers, which can significantly degrade water quality. Conservation practices, such as filter strips, no-till planting, and windbreaks, help to control erosion. In some cases, however, it is best to take the eroding soil out of crop production.

Tillage.—Frequent plowing was once considered to be important to crop production. It was believed that tilling broke the soil into small particles that plants could digest. It was not until the 1800's that agricultural researchers showed that plants do not eat soil directly but rather remove dissolved nutrients from the soil. It was also discovered that organic matter played an important role in crop production. For soils that were continually plowed every spring and fall, farmers noticed that yields began to decrease. Excessive tillage can break down soil structure, cause a loss of organic matter, and increase the hazard of erosion. Over time, equipment used for cultivation and harvesting can significantly compact the soil. With the increasing use of heavy machinery, damage caused by soil compaction can become extremely severe if machinery is used when the soil is extremely wet.

Soils susceptible to damage from machinery and tillage are generally heavy textured soils, such as Othello, Elkton, and Kentuck soils, and soils on steep slopes. On heavy textured soils, chisel plowing to a depth of 10 to 18 inches every 3 to 5 years can improve aeration and enhance root development.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 7. The main concerns in managing nonirrigated cropland are conserving moisture, controlling soil blowing and water erosion, and maintaining soil fertility. The limitations and hazards listed in this table apply only to the crops shown in table 8.

Conserving moisture consists primarily of reducing the evaporation and runoff rates and increasing the water intake rate. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Generally, a combination of several practices is needed to control *soil blowing* and *water erosion.* Conservation tillage, stripcropping, field windbreaks, tall grass barriers, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in maintaining *soil fertility* include applying both organic and inorganic fertilizer, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These include *channels, flooding, depth to rock, ponding,* and *gullies.*

Additional limitations and hazards are as follows:

Excessive permeability.—This limitation causes deep leaching of nutrients and pesticides. The capacity of the soil to retain moisture for plant use is poor.

Potential for ground-water pollution.—This is a hazard in soils that have excessive permeability, hard bedrock, or a water table within the profile.

Limited available water capacity, poor tilth, restricted permeability, and *surface crusting.*—These limitations can be overcome by incorporating manure or crop residue into the soil, applying a system of conservation tillage, and using conservation cropping systems.

Slope.—Where the slope is more than 8 percent, water erosion and soil blowing may be accelerated unless conservation farming practices are applied.

Salt and sodium content.—In areas where this is a limitation, only salt- and sodium-tolerant crops should be grown.

On irrigated soils the main management concerns are *efficient water use, nutrient management, control of erosion, pest and weed control,* and *timely planting and harvesting* for a successful crop. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can create drainage problems, raise the water table, and increase soil salinity.

Following is an explanation of the criteria used to determine the limitations or hazards.

Erosion by water.—The surface K factor multiplied by the upper slope limit is more than 2 (same as prime farmland criteria).

Excessive permeability.—The upper limit of the permeability range is 6 inches or more within the soil profile.

Flooding.—The component of the map unit is occasionally flooded or frequently flooded.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 5 inches or less.

Ponding.—Ponding duration is assigned to the component of the map unit.

Potential for ground-water pollution.—The soil has a water table within a depth of 4 feet or permeability is more than 6 inches per hour within the soil.

Restricted permeability.—Permeability is 0.06 inch per hour or less within the soil profile.

Salt content.—The component of the map unit has an electrical conductivity of more than 4 in the surface layer or more than 8 within a depth of 30 inches.

Slope.—The upper slope range of the component of the map unit is more than 8 percent.

Soil blowing.—The wind erodibility index multiplied by the selected high C factor for the survey area and then divided by the T factor is more than 8 for the component of the map unit.

Water table.—The component of the map unit has a water table within a depth of 60 inches.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 8. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of 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.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is 100 bushels per acre or less, a rate of 100 to 120 pounds of nitrogen per acre should be used. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by the crop is an unnecessary expense and causes a hazard of water pollution. If corn or cotton is grown after the harvest of soybeans or peanuts, nitrogen rates can be reduced by about 20 to 30 pounds per acre. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 8 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops *(46)*. 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 and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numbers 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given 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 59,500 acres in Worcester County, or nearly 19 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county. About 36,500 acres, or nearly 12 percent of the survey area, would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available or if adequate drainage was provided.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 9. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures used to 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 6. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Due to the conversion of farmland and wildlife habitat to other uses, the State of Maryland has designated certain soils as Soils of Statewide

Importance. These soils were chosen based on a variety of factors and generally are potential wetland soils or are soils capable of supporting unique plant and/or wildlife communities. A list of the map units designated as Soils of Statewide Importance in Worcester County is shown in table 10.

Woodland Management and Productivity

In Worcester County there are no known remaining areas of virgin forest. Although many of the wooded areas are scattered throughout areas of farmland, two extensive tracts of woodland are located in the Pocomoke State Forest and the Cypress Swamp along the Pocomoke River. Trees have been cleared from much of the land suitable for cultivation. In the remaining woodland, the soils are usually too wet or too droughty for crop production. If managed properly, the soils in these areas produce trees of high quality.

About 140,000 acres in the county, or 45 percent of the total land acreage, is currently wooded. A majority of the forest land is owned privately by farmers, lumber and paper companies, and other individuals.

The largest areas of woodland are located along the Pocomoke River and in the Pocomoke State Forest area. The most common trees on the upland soils are loblolly pine, white oak, red oak, and hickory. The dominant trees on the wetter soils are loblolly pine, sweetgum, red maple, and baldcypress. Loblolly pine is the principal commercial timber crop in the county because of its ability to grow tall and straight in a relatively short time and under a wide range of conditions.

Much of the existing commercial woodland could be improved by thinning out mature trees and undesirable species. Protection from fire and control of insects and disease can also improve the stands. The Maryland Department of Natural Resources Forest Service or the Natural Resources Conservation Service can help to determine specific needs of woodland management.

Table 11 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In table 11, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed 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.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class* represents the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production *(44, 48)*.

Managing Woodland

The type and degree of limitation affecting woodland vary throughout Worcester County.

Soils that have no or slight limitations and that have a high potential productivity for loblolly pine include Hammonton, Hambrook, Matapeake, Mattapex, Nassawango, Sassafras, and Woodstown soils. These soils typically do not require special management to produce a high-quality stand of trees.

Due to their droughtiness, Cedartown, Evesboro, Fort Mott, Galestown, Rosedale, and Runclint soils have a moderately high potential productivity for loblolly pine. Seedling survival is largely limited by moisture stress. The rate of seedling mortality can be reduced by planting seedlings in early spring so that the seedlings can obtain sufficient moisture from spring rains. Drought-tolerant trees, such as loblolly pine, Virginia pine, and shortleaf pine, should be planted. In addition to moisture stress, the sandy surface layers of these soils can cause poor trafficability for equipment and a risk of erosion. Management practices that minimize the risk of erosion are essential for harvesting timber in the steeply sloping areas of these soils.

The potential productivity for loblolly pine is moderately high on Elkton, Fallsington, Hurlock, Klej, and Othello soils. The main limitation is the seasonal high water table. Trees that are tolerant of wet periods, such as loblolly pine, sweetgum, red maple, and baldcypress, should be planted.

Other soils that are limited by wetness include Berryland, Kentuck, and Mullica soils. The potential productivity for loblolly pine on these soils is low because of the effect of the seasonal high water table on seedling mortality, plant competition, and the difficulty of using equipment. Only trees that can tolerate seasonal wetness, such as sweetgum, red maple, Atlantic white-cedar, and baldcypress, are suited to these soils. Loblolly pine can be grown, but raised beds may be needed. Most of the woodland areas of wet soils are undrained.

Indiantown, Chicone, Manahawkin, and Puckum soils are not suited to commercial timber production because of the low soil stability, a flooding hazard, and a high water table. These soils are extremely well suited to the production of trees such as sweetgum, baldcypress, and Atlantic white-cedar for wildlife habitat.

Recreation

Worcester County offers recreational activities year round. During summer, Ocean City becomes a major vacation resort for people from Baltimore, Washington, and Philadelphia. The boardwalk, amusement parks, and beaches are a major draw for vacationing families. Sightseeing, fishing, and swimming are also available. Assateague Island National Refuge, with its wild ponies and camping areas, is also a big summer destination.

In addition to the resort atmosphere, the county also has vast expanses of woodlands, marshes, swamps, and streams which provide opportunities for picnicking, fishing, hunting, hiking, bicycling, and boating. The Pocomoke River and Nassawango Creek are used by canoers and boaters and offer beautiful scenery and bountiful wildlife. Public lands available for outdoor recreation include numerous state parks and wildlife management areas.

During winter, hunting becomes a tourist attraction in the southern part of the county. Deer, wild turkey, small game, duck, and geese seasons are scheduled throughout the winter.

The soils of the survey area are rated in table 12 according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 12, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 15 and interpretations for dwellings without basements and for local roads and streets in table 14.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes 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 period 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 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.

Wildlife Habitat

The combination of farmland, woodland, wetland, marshes, and beaches in Worcester County attracts a wide variety of wildlife. The county has large populations of whitetail deer, squirrels, rabbits, raccoons, and opossum inhabiting the farms, forests, and small towns. On Assateague Island, wild ponies are managed as a tourist attraction.

Many birds also inhabit Worcester County. Songbirds, owls, egrets, herons, and various hawks are common. In recent years, bald eagles and wild turkeys have been reintroduced to increase local populations. Turkey vultures and large flocks of grackles, blackbirds, and dove are frequently seen on many farms. Snow geese, Canada geese, and other migratory waterfowl utilize the ponds and open water areas throughout the county. Pelicans may even be seen along the beach during summer.

The seagrass beds of the coastal bays provide habitat for many animals, including blue crab, clams, oysters, and fish species such as flounder, sea trout, and rockfish. The Pocomoke River is home to an abundance of frogs, snakes, turtles, and fish such as chain pickerel and largemouth bass.

The soils of the county need to be managed so that open water areas and wetlands can provide safe habitat for the county's wildlife. Proper forestry and agricultural practices can help to maintain these areas.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used—in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat *(1)*. The ratings in table 13 are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

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 lovegrass, lespedeza, bromegrass, orchardgrass, timothy, 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, pokeweed, goldenrod, butterflyweed, switchgrass, bluegrass, redtop, gamagrass, and panicgrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, locust, holly, dogwood, and hickory.

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 loblolly pine, scrub pine, white pine, Virginia pine, spruce, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, arrow-arum, saltgrass, cordgrass, spatterdock, rushes, sedges, ferns, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, mourning dove, field sparrow, deer, cottontail rabbit, mice, and red fox.

Approximately 22 percent of the county, or 67,250 acres, has good potential as habitat for openland wildlife. The major soils in these areas are Cedartown, Mattapex, Sassafras, and Woodstown soils. Maintaining and establishing the vegetative elements of the habitat is not difficult on these soils.

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, woodcock, thrushes, woodpeckers, squirrels, red fox, raccoon, deer, opossum, and many other small mammals, reptiles, and songbirds.

Approximately 22 percent of the county, or 67,250 acres, has good potential as habitat for woodland wildlife. The most common soils in these areas are Cedartown, Mattapex, Matapeake, Sassafras, and Woodstown soils. Maintaining and establishing the vegetative elements of the habitat is not difficult on these soils. Much of the upland forest in Worcester County occurs on Evesboro, Galestown, and Klej soils, even though these soils are not the best suited to woodland habitat. Although establishing forest on these soils is more difficult due to droughtiness, once the forest is established, maintenance is relatively easy. In woodlands that have been managed for pine production, plant species diversity is commonly low. As a result, these areas generally support fewer animal species and smaller populations.

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, and muskrat.

Approximately 41 percent of the county, or 125,725 acres, has good potential as habitat for wetland wildlife. Wetlands that have a combination of open water areas and vegetated areas are the most valuable for wildlife. Although many wetland areas have been disturbed by development (such as commercial or residential sites adjacent to tidal marshes in the northern part of the county), wetlands generally are well away from intensive human activity. These areas provide a safe haven in which wildlife can hunt, nest, and feed. The two major types of wetlands in Worcester County are tidal wetlands and nontidal wetlands. The soils of these wetlands provide a valuable storage medium for retention of floodwaters, sediment, pollutants, and nutrients such as nitrogen and phosphorus. Although much of the potential tidal wetland area is already in that land use, there is a significant amount of land that could potentially be returned to nontidal wetland habitat through restoration of the hydrology and vegetation.

In areas of tidal wetlands, differences in the range of tidal fluctuation, in the depth of the water table, and in the degree of salinity of tidal waters result in a wide variety of soil characteristics and dominant vegetation. Based on these differences, three types of tidal wetlands occur in Worcester County. They are freshwater forested swamps, freshwater tidal marshes and mud flats, and salt marshes.

Freshwater forested swamps occur mainly along the Pocomoke River, Dividing Creek, and Nassawango Creek. The major soils in these areas are Manahawkin and Puckum soils. They are flooded twice daily by tidal waters that range from fresh (salinity of 0 parts per thousand) near Snow Hill to slightly brackish (salinity of 4 parts per thousand) around Pocomoke. The trees are dominantly baldcypress (Taxodium distichum), blackgum (Nyssa aquatica), red maple (Acer rubrum), sweetgum (Liquidambar styraciflua), swamp white oak (Quercus bicolor), and Atlantic white-cedar (Chamaecyparis thyoides). The understory vegetation commonly includes sweet pepperbush (Clethra alnifolia), arrowhead (Sagittaria latifolia), arrow-arum (Peltandra virginica), ferns, sedges, and mosses. These wetlands provide feeding and nesting habitat for many species of songbirds, including flycatchers, warblers, towhees, chickadees, titmice, tanagers, vireos, wrens, catbirds, thrushes, and woodpeckers.

Wading birds, such as herons and egrets, sometimes use forested swamps adjacent to tidal marshes for nesting. Where natural tree cavities or nesting boxes are available, wood ducks make extensive use of forested swamps for nesting and brood rearing. In addition to birds, wildlife in this wetland type include resident populations of turtles, frogs, toads, salamanders, snakes, otters, raccoons, mice, and other small mammals.

Freshwater tidal marshes and mud flats occur mainly along the Pocomoke River, Dividing Creek, and Nassawango Creek. These areas are inundated twice daily by tidal waters that range from 0 to 4 parts per thousand in salinity. Vegetation in these wetlands includes Olney's threesquare (Scirpus olneyi), tearthumb (Polygonum sagittaria), cattail (Typha), spatterdock (Nuphar advena), arrow-arum (Peltandra virginica), sweetflag (Acorus calamus), rice cutgrass (Leersia oryzoides), wildrice (Zizania aquatica), pickerelweed (Pontederia cordata), and smartweed (Polygonum). Wildlife attracted to these wetlands include many species of ducks, herons, egrets, rails, geese, wrens, red-winged blackbirds, and other songbirds. In mud flat areas, the tidal range is such that shallow water habitat is available to juvenile finfish for cover and feeding. This habitat provides food of high quality and quantity in the form of seeds, shoots, and roots (or rhizomes) during late spring, summer, and early fall. The lack of of emergent vegetation, and thus food and cover, on mud flats during winter reduces the use of these areas by waterfowl. The dominant soils in the marshes are Puckum and Manahawkin soils, those on the mud flats are Nanticoke and Mannington soils.

Worcester County has areas of brackish marshes, but these areas are not extensive. An area of brackish marsh exists near the county line along the Pocomoke River and in transitional areas along tidal streams flowing to the coastal bays. Vegetation is mixed in these areas.

Salt marshes make up about 7 percent, or 21,000 acres, of the county. They are located almost exclusively in areas bordering Chincoteague, Sinepuxent, Newport, and Assawoman Bays. The Ocean City Inlet to the north and Chincoteague Inlet to the south allow Atlantic Ocean water to enter the bays. Salinities in these areas typically are greater than 25 to 30 parts per thousand. The dominant soils of these wetlands are Boxiron, Transquaking, and Mispillion soils located mainly along the mainland side of the coastal bays and Broadkill and Purnell soils located adjacent to the barrier islands. Vegetation consists of saltgrass (Distichlis spicata), glasswort (Salicornia europaea), saltmarsh cordgrass (Spartina alterniflora), saltmeadow cordgrass (Spartina patens), and common reed (Phragmites australis). Marshelder (Iva frutescens) is common in the higher areas of the marsh. Salt marshes provide good nesting habitat for songbirds, marsh birds, and black ducks. The fiddler crab, a major food source for wading birds and herons, is common to many of the salt marshes. Along the marsh-water interface, mussels can often be found attached to the edge of the marsh. Blue crabs, clams, and small fish are commonly seen in the shallow tidal creeks which wind through these marshes.

In addition to the tidal wetlands described above, Worcester County is 34 percent, or nearly 105,000 acres, nontidal wetlands. These wetlands are generally not influenced by daily tidal fluctuations, but periodic flooding or ponding can occur after storm events. The two types of nontidal wetlands in the county occur on flood plains and low-lying flats. There are also numerous isolated small areas where water remains long enough during the year to support wetland vegetation. On flood plains, the dominant soils are Zekiah, Indiantown, Chicone, Puckum, and Manahawkin soils. On the large expanses of low-lying flats, the dominant soils are Othello, Fallsington, Mullica, and Berryland soils. The nontidal wetlands in Worcester County are dominantly forested with vegetation consisting of willow oak (Quercus phellos), red maple (Acer rubrum), sweetgum (Liquidambar styraciflua), blackgum (Nyssa aquatica), swamp white oak (Quercus bicolor), highbush blueberry (Vaccinium corymbosum), skunk cabbage (Symplocarpus foetidus), ferns, sedges, and sphagnum moss. These areas provide food and cover for many songbirds and woodpeckers. In early spring, frogs, salamanders, and toads use ponded areas for breeding habitat. During summer when there are few, if any, areas of standing water, nontidal wetlands can provide habitat similar to that of adjacent transitional/upland areas. During these times, smaller mammals, such as mice, shrews, voles, opossum, and skunks, can use these wetlands for feeding and protective cover.

Many agricultural fields in areas of Fallsington and Othello soils can be converted back to forested nontidal wetlands by restoring the original hydrology. Due to the extensive artificial drainage systems installed in the county between the 1940's and 1960's, large areas of Fallsington and Othello soils are now cultivated for grain crops. Management measures such as closing off ditches and building berms can easily create wetlands. In some cases, managed flooding using water-control structures can provide significant areas of standing water during late fall and winter which can be used by migrating waterfowl.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not 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 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 kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns, landscaping, and golf fairways. 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 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 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 high water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories.

Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns, landscaping, and *golf fairways* require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Worcester Soil Conservation District or the local office of the Cooperative Extension Service.

Sanitary Facilities

Table 15 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 15 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock 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 animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 15 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, 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 or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 15 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, 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 soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock 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.

Waste Management

Waste management includes land application of manure and food processing waste, land application of sewage sludge, wastewater irrigation, and treatment of wastewater by rapid infiltration.

Land application of manure, food processing waste, and municipal sewage sludge uses the waste materials in a liquid form, as a slurry, or as a solid. The materials have a variable content of nitrogen and phosphorus which can effect the application rate. The soil properties and qualities considered are those that effect soil absorption, plant growth, microbial activity, susceptibility to soil blowing and water erosion, and the rate of waste application. Soil properties that affect absorption are permeability, depth to a seasonal high water table, and the available water-holding capacity. Plant growth and microbial activity are largely affected by soil reaction and salinity. Susceptibility to soil blowing and water erosion are affected by the slope, soil erosion factor, and wind erodibility. The depth to a seasonal high water table, ponding, and flooding can interfere with the application of wastes. The proper use of food processing waste or manure requires a periodic check for the content of nitrogen and phosphorus. When using municipal sewage sludge, tests for heavy metal and other toxic substances should be performed in addition to tests for nutrient levels. When utilizing these waste materials for crop production it is also important to have a soil test performed yearly to determine the nutrient needs of the anticipated crop.

Disposal of wastewater by irrigation requires soils that can take in large quantities of water and be able to adsorb the nutrients. The wastewater typically comes from a municipality or from food processing plants. Usually, the wastewater has undergone primary or secondary treatment prior to irrigation. In some rare cases, the wastewater is untreated. The nutrient content varies considerably. The soil properties and qualities considered are those that affect design, construction, management, and performance of wastewater irrigation systems. The soil properties and qualities important in design and construction are depth to a seasonal high water table, the available water-holding capacity, permeability, erosion factor, wind erodibility, the slope, ponding, and flooding. The soil properties and qualities that affect performance and management of the irrigation system are salinity, soil reaction, and permeability.

Treatment of wastewater by the slow rate process or the rapid infiltration process is primarily used for the treatment of the wastewater rather than for crop production. The slow rate process is performed at a rate typically between 0.5 inch and 4.0 inches of wastewater per acre per week. The applied wastewater is treated as it moves through the soil. Much of the treated water percolates to the ground water, and some enters the atmosphere through evapotranspiration. The rapid infiltration process is performed at a rate between 4.0 and 120 inches per acre per week. In this process, the wastewater is applied in a level basin where it percolates rapidly through the soil. The treated water eventually reaches the ground water. Detailed soils, geology, and hydrology investigations are important during the planning stages to ensure feasibility and proper design and to determine potential hazards of ground-water pollution and the reliability of a system's performance. Municipal wastewater having a low content of nitrogen is sometimes applied using this method. Vegetation is not a necessary component of these systems, and the basins may or may not be vegetated.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to 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 high water table is more than 3 feet. Soils rated *fair* have 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 high 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 high water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, 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 high water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a high 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 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 or stones, 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 or stones, have slopes of more than 15 percent, or have a high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, mica, or salts or sodium. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock 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, 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.

Drainage may be a major management consideration in some areas. Management of drainage in conformance with regulations concerning wetlands may require special permits and extra planning. The local office of the Natural Resources Conservation Service should be contacted for identification of hydric soils and potential wetlands.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to a high water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, a low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 18, Parts I and II, give 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, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter *(36)*. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 19 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

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.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, more 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. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. The soils assigned to group 1 are the most susceptible to soil blowing, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, 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

Tables 20 and 21 give estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. In table 20, soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 20, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 20 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* 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). *Common* is used when occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in table 20 are the depth to the high water table; the kind of water table—that is, *perched* or *apparent*; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 20.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the high 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.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 21 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors. Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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 high water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

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.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces. Generally, cool aspects are north- to east-facing and warm aspects are south- to west-facing.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal 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.

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.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Board foot. A unit of measure of the wood in lumber, logs, or trees. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick before finishing.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brackish water. Water in which the content of salt is greater than that in fresh water but less than that in seawater. Commonly in estuarine and river areas where seawater and fresh water mix.

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.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channeled. Refers to a streambed in which meandering, repeated branching, and convergence of streams, either active or abandoned, have created deeply incised cuts in alluvial material.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clayey soil. Silty clay, sandy clay, or clay.

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.

Clearcutting. A method of forest harvesting that removes the entire stand of trees in one cutting. The stand is reproduced artificially or by natural seeding from adjacent stands.

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.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

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.

Codominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

Commercial forest. Forest land capable of producing 20 cubic feet or more per acre per year at the culmination of mean annual increment.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation 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."

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deep soil. A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

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.

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.

Dominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above and from the sides.

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.

Drainageway. A land area that is lower in elevation than surrounding areas and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may have distinctly incised channels at its upper reaches or throughout its course.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

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.

Escarpment. A relatively continuous and steep slope or cliff along the margin of old marine terraces. Exposed material is hard or soft bedrock. Synonym: scarp.

Estuarine. Term relating to marsh soils that may contain mineral material with high *n* value that was deposited by tidally influenced streams in a quiescent environment.

Even-aged. Refers to a stand of trees in which only small differences in age occur between individual trees. A range of 20 years is allowed.

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 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.

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. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

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.

Fluviomarine. Of or pertaining to material deposited by oceans and reworked and deposited by streams after exposure.

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 which differentiate it from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that 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.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A very small channel with steep sides cut by running water and through which water ordinarily runs only after rainfall, icemelt, or snowmelt. 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. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Gypsum. A mineral consisting of hydrous calcium sulfate.

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.

Heavy metals. Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

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 that are used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A horizon 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.

Hummock. A small, irregularly shaped knob or mound consisting of mineral and/or organic material in wetland areas covered by vegetation.

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 high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

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 pasture, 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 that have a low content of iron and manganese oxide because of chemical reduction and removal but also have 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 used include:

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.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine-grained material, dominantly of silt-sized particles, deposited by the wind.

Lowland flat. A term used to describe a large area of land that has little or no relief and has soils with seasonal high water tables.

Low-residue crops. Such crops as corn that are 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.

Mean annual increment. The average annual volume of a stand of trees from the year of origin to the age under consideration.

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.

Merchantable trees. Trees that are of sufficient size to be economically processed into wood products.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately deep soil. A soil that is 20 to 40 inches deep to bedrock or other material that restricts the penetration of plant roots.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

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 (mottles). Irregular spots of different colors that vary in number and size. They result from impeded drainage and poor aeration or as a result of weathering of geologic material. Redoximorphic features are a type of mottle resulting from conditions of wetness. Lithochromic or lithomorphic mottles are mottles which retain colors of the original geologic materials. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mud flat. A level area of fine-grained material adjacent to a shoreline that is alternately inundated and exposed completely by tides and that is barren of vegetation during winter.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

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.

***n* value.** A term used to describe the fluidity of soil materials based on water content, degree of aeration, clay content, and organic matter content. Soils that have an *n* value of greater than 0.7 have never dried below field capacity after deposition in an aquatic environment.

Observed rooting depth. Depth to which roots have been observed to penetrate.

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

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

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.*

Panne. A small unvegetated area or pond in a tidal marsh, commonly having a higher content of salt than the surrounding areas of marsh.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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.

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 weather conditions and soil moisture conditions 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.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. They indicate 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. They indicate the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation. Descriptive terms for concentrations and depletions are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regeneration. The new growth of a natural plant community, developing from seed.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relict stream terrace. One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riverwash. Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

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.

Rock outcrop. An area of exposed bedrock in a map unit that has less than 0.1 percent exposed bedrock. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

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.

Salinity. The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline	0 to 4
Slightly saline	4 to 8
Moderately saline	8 to 16
Strongly saline	more than 16

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments ranging 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.

Sandy soil. Sand or loamy sand.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Saw logs. Logs of suitable size and quality for the production of lumber.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Scribner's log rule. A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

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.

Shallow soil. A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The landscape position, parallel to the summit, that is directly below the ridgetop and directly above the side slope. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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, 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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Skid trails. The paths left by skidding logs and the bulldozer or tractor used to pull them.

Slash. The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Species. A single, distinct kind of plant or animal having certain distinguishing characteristics.

Stone line. A concentration of rock 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.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that was produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subaqueous. Refers to soils that generally occur in areas with permanent water depths of 0.5 foot to 9.0 feet. Within this range of water depth, enough sunlight is available for the growth of aquatic plants.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

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.

Swamp. An area of low, saturated soils that is intermittently or permanently covered with fresh water and typically vegetated by trees and shrubs.

Tailwater. The water directly downstream of a structure.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

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.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Urban land. An area where more than 75 percent of the surface is covered by asphalt pavement, concrete, buildings, or other manmade impervious structures or materials.

Valley. An elongated depressional area primarily developed by stream action.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Very deep soil. A soil that is more than 60 inches deep to bedrock or other material that restricts the penetration of plant roots.

Very shallow soil. A soil that is less than 10 inches deep to bedrock or other material that restricts the penetration of plant roots.

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 to divert water off and away from the road surface. Water bars can be easily driven over if they are constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Snow Hill, Maryland)

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
January-----	44.7	25.9	35.3	68	0	62	3.80	2.26	5.21	6	5.1
February----	47.0	27.9	37.4	72	6	77	3.61	2.40	4.88	6	4.3
March-------	55.9	35.1	45.5	81	15	205	4.30	2.23	6.06	7	2.1
April-------	65.6	42.4	54.0	88	25	400	3.21	1.79	4.57	6	.1
May---------	74.8	52.4	63.6	92	33	720	3.52	1.59	5.17	6	.0
June--------	82.7	61.1	71.9	95	44	944	3.43	1.85	4.83	6	.0
July--------	86.2	65.5	75.8	97	49	1,096	4.10	2.11	5.84	7	.0
August------	85.3	64.3	74.8	95	47	1,054	5.37	2.28	7.99	6	.0
September---	80.1	57.6	68.8	94	37	835	3.29	1.93	4.57	4	.0
October-----	69.4	46.5	58.0	86	25	538	3.24	1.52	4.83	5	.0
November----	59.9	38.6	49.2	78	19	283	3.22	1.69	4.63	5	.2
December----	49.4	30.2	39.8	71	8	114	3.44	1.72	4.83	6	1.7
Yearly:											
Average---	66.7	45.6	56.2	---	---	---	---	---	---	---	---
Extreme---	---	---	---	98	-1	---	---	---	---	---	---
Total-----	---	---	---	---	---	6,328	44.53	34.97	52.16	70	13.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Snow Hill, Maryland)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 1	Apr. 16	May 4
2 years in 10 later than--	Mar. 27	Apr. 11	Apr. 29
5 years in 10 later than--	Mar. 17	Apr. 2	Apr. 20
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 4	Oct. 13	Oct. 5
2 years in 10 earlier than--	Nov. 9	Oct. 19	Oct. 11
5 years in 10 earlier than--	Nov. 20	Oct. 30	Oct. 20

Table 3.—Growing Season

(Recorded in the period 1961-90 at Snow Hill, Maryland)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	212	187	165
8 years in 10	219	195	171
5 years in 10	233	209	182
2 years in 10	246	223	193
1 year in 10	254	230	198

Table 4.—Classification of the Soils

Soil name	Family or higher taxonomic class
Acquango	Mixed, mesic Typic Udipsamments
Askecksy	Siliceous, mesic Typic Psammaquents
Berryland	Sandy, siliceous, mesic Typic Haplaquods
Boxiron	Fine-silty, mixed, nonacid, mesic Histic Sulfaquents
Broadkill	Fine-silty, mixed, nonacid, mesic Typic Sulfaquents
Brockatonorton	Mixed, mesic Aquic Udipsamments
Cedartown	Sandy, siliceous, mesic Psammentic Hapludults
Chicone	Coarse-silty, mixed, acid, mesic Thapto-Histic Fluvaquents
Elkton	Fine-silty, mixed, mesic Typic Endoaquults
Evesboro	Mesic, coated Typic Quartzipsamments
Fallsington	Fine-loamy, mixed, mesic Typic Endoaquults
Fort Mott	Loamy, siliceous, mesic Arenic Hapludults
Galestown	Sandy, siliceous, mesic Psammentic Hapludults
Hambrook	Fine-loamy, siliceous, mesic Typic Hapludults
Hammonton	Coarse-loamy, siliceous, mesic Aquic Hapludults
Hurlock	Coarse-loamy, siliceous, mesic Typic Endoaquults
Indiantown	Coarse-loamy, siliceous, acid, mesic Cumulic Humaquepts
Kentuck	Fine-silty, mixed, mesic Typic Umbraquults
Klej	Mesic, coated Aquic Quartzipsamments
Manahawkin	Sandy or sandy-skeletal, siliceous, dysic, mesic Terric Medisaprists
Mannington	Fine-silty, mixed, nonacid, mesic Typic Hydraquents
Matapeake	Fine-silty, mixed, mesic Typic Hapludults
Mattapex	Fine-silty, mixed, mesic Aquic Hapludults
Mispillion	Loamy, mixed, euic, mesic Terric Sulfihemists
Mullica	Coarse-loamy, siliceous, acid, mesic Typic Humaquepts
Nanticoke	Fine-silty, mixed, nonacid, mesic Typic Hydraquents
Nassawango	Fine-silty, mixed, mesic Typic Hapludults
Othello	Fine-silty, mixed, mesic Typic Endoaquults
Puckum	Dysic, mesic Typic Medisaprists
Purnell	Sandy, mixed, mesic Histic Sulfaquents
Rosedale	Loamy, siliceous, mesic Arenic Hapludults
Runclint	Mesic, coated Typic Quartzipsamments
Sassafras	Fine-loamy, siliceous, mesic Typic Hapludults
Sunken	Fine-silty, mixed, mesic Typic Endoaqualfs
Transquaking	Euic, mesic Typic Sulfihemists
Udorthents	Udorthents
Woodstown	Fine-loamy, mixed, mesic Aquic Hapludults
Zekiah	Coarse-loamy, siliceous, acid, mesic Typic Fluvaquents

Table 5.—Soil Temperature of Selected Soil Series

Map unit symbol	Soil series	Land use	Mean annual temperature for-- 1992	1993	1994	1995	Average annual soil temperature
CeA	Cedartown	Reforested land	57.5	51.7	51.1	53.0	53.3
CeB	Rosedale	Cropland	55.9	52.7	50.5	53.3	53.3
NsA	Nassawango	Cropland	56.2	52.1	51.0	55.3	53.7
RuA	Runclint	Woodland	55.6	50.9	50.0	53.0	52.4

Table 6.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AcB	Acquango sand, 2 to 5 percent slopes	890	0.2
AcC	Acquango sand, 5 to 10 percent slopes	249	0.1
As	Askecksy loamy sand	17,693	4.7
Be	Beaches	750	0.2
Bh	Berryland mucky loamy sand	6,217	1.7
BkA	Brockatonorton sand, 0 to 2 percent slopes	1,094	0.3
BkB	Brockatonorton sand, 2 to 5 percent slopes	1,144	0.3
Br	Broadkill mucky silt loam	1,851	0.5
BX	Boxiron and Broadkill soils	2,521	0.7
CeA	Cedartown-Rosedale complex, 0 to 2 percent slopes	3,205	0.9
CeB	Cedartown-Rosedale complex, 2 to 5 percent slopes	4,283	1.1
Ch	Chicone mucky silt loam	1,220	0.3
Ek	Elkton sandy loam	917	0.2
Em	Elkton silt loam	1,562	0.4
EvA	Evesboro loamy sand, 0 to 2 percent slopes	928	0.3
EvB	Evesboro loamy sand, 2 to 5 percent slopes	2,865	0.8
EvC	Evesboro loamy sand, 5 to 10 percent slopes	1,680	0.5
Fa	Fallsington sandy loam	29,244	7.8
FmA	Fott Mott loamy sand, 0 to 2 percent slopes	731	0.2
FmB	Fott Mott loamy sand, 2 to 5 percent slopes	2,507	0.7
GaA	Galestown loamy sand, 0 to 2 percent slopes	886	0.2
GaB	Galestown loamy sand, 2 to 5 percent slopes	1,885	0.5
GaC	Galestown loamy sand, 5 to 10 percent slopes	1,059	0.3
HbA	Hambrook sandy loam, 0 to 2 percent slopes	7,488	2.0
HbB	Hambrook sandy loam, 2 to 5 percent slopes	4,383	1.2
HmA	Hammonton loamy sand, 0 to 2 percent slopes	5,680	1.5
HmB	Hammonton loamy sand, 2 to 5 percent slopes	2,096	0.6
Hu	Hurlock loamy sand	10,586	2.8
In	Indiantown silt loam	5,296	1.4
Ke	Kentuck silt loam	11,238	3.0
KsA	Klej loamy sand, 0 to 2 percent slopes	7,033	1.9
KsB	Klej loamy sand, 2 to 5 percent slopes	3,437	0.9
Ma	Manahawkin muck	5,353	1.4
MC	Mannington and Nanticoke soils	134	*
MeA	Matapeake fine sandy loam, 0 to 2 percent slopes	1,025	0.3
MeB	Matapeake fine sandy loam, 2 to 5 percent slopes	625	0.2
MkA	Matapeake silt loam, 0 to 2 percent slopes	1,425	0.4
MkB	Matapeake silt loam, 2 to 5 percent slopes	775	0.2
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes	6,279	1.7
MpB	Mattapex fine sandy loam, 2 to 5 percent slopes	1,268	0.3
MqA	Mattapex silt loam, 0 to 2 percent slopes	4,064	1.1
MqB	Mattapex silt loam, 2 to 5 percent slopes	725	0.2
Mu	Mullica-Berryland complex	26,581	7.1
NnA	Nassawango fine sandy loam, 0 to 2 percent slopes	3,117	0.8
NnB	Nassawango fine sandy loam, 2 to 5 percent slopes	1,312	0.3
NsA	Nassawango silt loam, 0 to 2 percent slopes	2,549	0.7
NsB	Nassawango silt loam, 2 to 5 percent slopes	715	0.2
Ot	Othello silt loam	40,379	10.8
Pk	Puckum mucky peat	8,789	2.4
Pu	Purnell peat	3,610	1.0
RoA	Rosedale loamy sand, 0 to 2 percent slopes	1,743	0.5
RoB	Rosedale loamy sand, 2 to 5 percent slopes	2,170	0.6
RuA	Runclint loamy sand, 0 to 2 percent slopes	1,799	0.5
RuB	Runclint loamy sand, 2 to 5 percent slopes	3,993	1.1
SaA	Sassafras sandy loam, 0 to 2 percent slopes	3,508	0.9
SaB	Sassafras sandy loam, 2 to 5 percent slopes	4,414	1.2
SaC	Sassafras sandy loam, 5 to 10 percent slopes	342	0.1
Su	Sunken mucky silt loam	110	*
Tk	Transquaking mucky peat	1,521	0.4
TP	Transquaking and Mispillion soils	6,541	1.8
Uc	Urban land-Acquango complex	312	0.1

See footnote at end of table

Table 6.—Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
Um	Urban land-Askecksy complex	471	0.1
Un	Urban land-Brockatonorton complex	626	0.2
Ur	Urban land	1,048	0.3
Ut	Urban land-Udorthents complex	1,545	0.4
Uz	Udorthents	3,038	0.8
WdA	Woodstown sandy loam, 0 to 2 percent slopes	12,416	3.3
WdB	Woodstown sandy loam, 2 to 5 percent slopes	3,339	0.9
Zk	Zekiah silt loam	3,621	1.0
W	Water	70,400	18.8
	Total	374,300	100.0

* Less than 0.1 percent.

Table 7.—Main Limitations and Hazards Affecting Cropland

(See text for a description of the limitations and hazards listed in this table)

Map symbol and soil name	Limitations or hazards
AcB: Acquango	Acidity (soil needs lime), excessive permeability, flooding, limited available water capacity, salt content, soil blowing.
AcC: Acquango	Acidity (soil needs lime), excessive permeability, flooding, limited available water capacity, salt content, slope, soil blowing.
As: Askecksy	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing, water table.
Be: Beaches	Nonsoil material.
Bh: Berryland	Acidity (soil needs lime), excessive permeability, limited available water capacity, ponding, water table.
BkA, BkB: Brockatonorton	Acidity (soil needs lime), excessive permeability, flooding, salt content, soil blowing, water table.
Br: Broadkill	Acidity (soil needs lime), flooding, ponding, salt content, water table.
BX:	
Boxiron	Acidity (soil needs lime), excessive permeability, flooding, ponding, salt content, water table.
Broadkill	Acidity (soil needs lime), flooding, ponding, salt content, water table.

Table 7.—Main Limitations and Hazards Affecting Cropland--Continued

Map symbol and soil name	Limitations or hazards
CeA, CeB:	
Cedartown	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing, water table.
Rosedale	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
Ch Chicone	Acidity (soil needs lime), excessive permeability, flooding, ponding, water table.
Ek Elkton	Acidity (soil needs lime), restricted permeability, soil blowing, water table.
Em Elkton	Acidity (soil needs lime), restricted permeability, soil blowing, water table.
EvA, EvB Evesboro	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing.
EvC Evesboro	Acidity (soil needs lime), excessive permeability, limited available water capacity, slope, soil blowing.
Fa Fallsington	Acidity (soil needs lime), soil blowing, water table.
FmA, FmB Fort Mott	Acidity (soil needs lime), excessive permeability, soil blowing.
GaA, GaB Galestown	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing.
GaC Galestown	Acidity (soil needs lime), excessive permeability, limited available water capacity, slope, soil blowing.
HbA, HbB Hambrook	Acidity (soil needs lime), restricted permeability, soil blowing, water table.

Table 7.--Main Limitations and Hazards Affecting Cropland--Continued

Map symbol and soil name	Limitations or hazards
HmA, HmB: Hammonton	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
Hu: Hurlock	Acidity (soil needs lime), excessive permeability, restricted permeability, soil blowing, water table.
In: Indiantown	Acidity (soil needs lime), excessive permeability, flooding, ponding, soil blowing, water table.
Ke: Kentuck	Acidity (soil needs lime), excessive permeability, ponding, restricted permeability, soil blowing, water table.
KsA: Klej	Acidity (soil needs lime), excessive permeability, restricted permeability, soil blowing, water table.
KsB: Klej	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing, water table.
Ma: Mannahawkin	Acidity (soil needs lime), excessive permeability, flooding, ponding, soil blowing, water table.
MC:	
Mannington	Acidity (soil needs lime), flooding, ponding, water table.
Nanticoke	Acidity (soil needs lime), flooding, ponding, water table.
MeA, MeB, MkA: Matapeake	Acidity (soil needs lime), soil blowing.
MkB: Matapeake	Acidity (soil needs lime), water erosion, soil blowing.

Table 7.--Main Limitations and Hazards Affecting Cropland--Continued

Map symbol and soil name	Limitations or hazards
MpA, MpB, MqA----- Mattapex	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
MqB--------------- Mattapex	Acidity (soil needs lime), water erosion, excessive permeability, soil blowing, water table.
Mu:	
Mullica----------	Acidity (soil needs lime), excessive permeability, limited available water capacity, ponding, water table.
Berryland--------	Acidity (soil needs lime), excessive permeability, limited available water capacity, ponding, water table.
NnA--------------- Nassawango	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
NnB--------------- Nassawango	Acidity (soil needs lime), water erosion, excessive permeability, soil blowing, water table.
NsA--------------- Nassawango	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
NsB--------------- Nassawango	Acidity (soil needs lime), water erosion, excessive permeability, soil blowing, water table.
Ot---------------- Othello	Acidity (soil needs lime), soil blowing, water table.
Pk---------------- Puckum	Acidity (soil needs lime), flooding, ponding, water table.
Pu---------------- Purnell	Acidity (soil needs lime), excessive permeability, flooding, ponding, salt content, water table.

Table 7.--Main Limitations and Hazards Affecting Cropland--Continued

Map symbol and soil name	Limitations or hazards
RoA, RoB: Rosedale	Acidity (soil needs lime), excessive permeability, soil blowing, water table.
RuA, RuB: Runclint	Acidity (soil needs lime), excessive permeability, limited available water capacity, soil blowing, water table.
SaA, SaB: Sassafras	Acidity (soil needs lime), soil blowing.
SaC: Sassafras	Acidity (soil needs lime), water erosion, slope, soil blowing.
Su: Sunken	Acidity (soil needs lime), flooding, ponding, restricted permeability, salt content, water table.
Tk: Transquaking	Acidity (soil needs lime), flooding, ponding, restricted permeability, salt content, water table.
TP:	
Transquaking	Acidity (soil needs lime), flooding, ponding, restricted permeability, salt content, water table.
Mispillion	Acidity (soil needs lime), flooding, ponding, salt content, water table.
Uc:	
Urban land	Nonsoil material.
Acquango	Acidity (soil needs lime), excessive permeability, flooding, limited available water capacity, salt content, soil blowing.
Um:	
Urban land	Nonsoil material.

Table 7.—Main Limitations and Hazards Affecting Cropland--Continued

Map symbol and soil name	Limitations or hazards
Um:	
Askecksy	Acidity (soil needs lime), excessive permeability, limited available water capacity, water table.
Un:	
Urban land	Nonsoil material.
Brockatonorton	Acidity (soil needs lime), excessive permeability, flooding, salt content, water table.
Ur Urban land	Nonsoil material.
Ut:	
Urban land	Nonsoil material.
Udorthents	Acidity (soil needs lime), excessive permeability, water table.
Uz Udorthents	Acidity (soil needs lime), excessive permeability, water table.
WdA, WdB Woodstown	Acidity (soil needs lime), water table.
Zk Zekiah	Acidity (soil needs lime), flooding, water table.

Table 8.--Land Capability and Yields per Acre of Crops

(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. N means nonirrigated; I, irrigated)

Map symbol and soil name	Land capability		Corn		Soybeans		Wheat		Barley		Sweet corn	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Tons	Tons
AcB, AcC---------- Acquango	8S	---	---	---	---	---	---	---	---	---	---	---
As---------------- Askecksy	3W	---	---	70	---	25	---	---	---	---	---	---
Be---------------- Beaches	8S	---	---	---	---	---	---	---	---	---	---	---
Bh---------------- Berryland	5W	---	---	---	---	---	---	---	---	---	---	---
BkA--------------- Brockatonorton	3S	---	---	---	---	---	---	---	---	---	---	---
BkB--------------- Brockatonorton	3E	---	---	---	---	---	---	---	---	---	---	---
Br---------------- Broadkill	8W	---	---	---	---	---	---	---	---	---	---	---
BX---------------- Boxiron and Broadkill	8W	---	---	---	---	---	---	---	---	---	---	---
CeA:												
Cedartown---------	3S	2S	70	150	30	40	30	65	---	---	---	---
Rosedale----------	3S	---	110	150	43	70	40	50	---	---	---	---
CeB:												
Cedartown---------	3S	2S	70	150	30	40	30	65	---	---	---	---
Rosedale----------	3S	---	110	150	43	70	40	50	---	---	---	---
Fa---------------- Fallsington	4W	---	70	---	30	---	35	---	40	---	---	---
FmA--------------- Fort Mott	3S	2S	110	150	75	48	---	---	---	---	---	---
FmB--------------- Fort Mott	3S	2S	110	150	75	48	---	---	---	---	---	---
GaA--------------- Galestown	3S	---	60	150	30	40	25	65	---	---	---	6
GaB--------------- Galestown	3S	---	60	150	30	40	25	65	---	---	---	6
HbA--------------- Hambrook	1	---	110	165	45	55	50	55	60	70	---	6
HbB--------------- Hambrook	2E	---	110	165	40	55	50	55	60	70	---	5

Table 8.—Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Corn		Soybeans		Wheat		Barley		Sweet corn	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Tons	Tons
HmA--------------- Hammonton	2W	---	90	---	30	---	35	---	---	---	---	---
HmB--------------- Hammonton	2W	---	90	---	30	---	35	---	---	---	---	---
Hu---------------- Hurlock	4W	---	70	---	25	---	25	---	---	---	---	---
In---------------- Indiantown	5W	---	---	---	---	---	---	---	---	---	---	---
KsA, KsB---------- Klej	3W	---	110	140	30	38	---	---	---	---	---	---
Ma---------------- Manahawkin	5W	---	---	---	---	---	---	---	---	---	---	---
MC---------------- Mannington and Nanticoke	8W	---	---	---	---	---	---	---	---	---	---	---
MeA--------------- Matapeake	1	---	140	170	45	60	50	---	---	---	---	---
MeB--------------- Matapeake	2E	---	140	170	45	60	50	---	---	---	---	---
MkA--------------- Matapeake	1	---	140	170	45	60	50	---	---	---	---	---
MkB--------------- Matapeake	2E	---	140	170	45	60	50	---	---	---	---	---
MpA--------------- Mattapex	2W	---	135	165	40	55	65	---	---	---	---	---
MpB--------------- Mattapex	2E	---	135	165	40	55	60	---	---	---	---	---
MqA--------------- Mattapex	2W	---	135	165	40	55	65	---	---	---	---	---
MqB--------------- Mattapex	2E	---	135	165	40	55	60	---	---	---	---	---
Mu---------------- Mullica-Berryland	4W	---	---	---	---	---	---	---	---	---	---	---
NnA--------------- Nassawango	1	---	140	---	45	---	60	---	---	---	---	---
NnB--------------- Nassawango	2E	---	140	---	45	---	60	---	---	---	---	---
NsA--------------- Nassawango	1	---	140	---	45	---	60	---	---	---	---	---
NsB--------------- Nassawango	2E	---	140	---	45	---	60	---	---	---	---	---

Table 8.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Corn		Soybeans		Wheat		Barley		Sweet corn	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu	Bu	Bu	Tons	Tons
Ot---------------- Othello	3W	---	115	---	40	---	55	---	---	---	---	---
Pk---------------- Puckum	5W	---	---	---	---	---	---	---	---	---	---	---
Pu---------------- Purnell	8W	---	---	---	---	---	---	---	---	---	---	---
RoA--------------- Rosedale	3S	---	110	150	43	70	40	50	---	---	---	---
RoB--------------- Rosedale	3S	---	110	150	43	70	40	50	---	---	---	---
SaA--------------- Sassafras	1	---	130	175	45	---	50	70	---	---	---	---
SaB--------------- Sassafras	2E	---	130	170	45	---	50	65	---	---	---	---
SaC--------------- Sassafras	3E	---	120	---	40	---	45	---	---	---	---	---
Su---------------- Sunken	6W	---	---	---	---	---	---	---	---	---	---	---
Tk---------------- Transquaking	8W	---	---	---	---	---	---	---	---	---	---	---
TP---------------- Transquaking and Mispillion	8W	---	---	---	---	---	---	---	---	---	---	---
WdA--------------- Woodstown	2W	---	130	170	40	50	45	50	60	---	---	---
WdB--------------- Woodstown	2W	---	130	170	40	50	45	50	60	---	---	---
Zk---------------- Zekiah	5W	---	---	---	---	---	---	---	---	---	---	---

Table 9.—Prime Farmland

Map symbol	Prime farmland code*	Soil name
Fa	2	Fallsington sandy loam
FmA	4	Fott Mott loamy sand, 0 to 2 percent slopes
FmB	4	Fott Mott loamy sand, 2 to 5 percent slopes
HbA	1	Hambrook sandy loam, 0 to 2 percent slopes
HbB	1	Hambrook sandy loam, 2 to 5 percent slopes
MeA	1	Matapeake fine sandy loam, 0 to 2 percent slopes
MeB	1	Matapeake fine sandy loam, 2 to 5 percent slopes
MkA	1	Matapeake silt loam, 0 to 2 percent slopes
MkB	1	Matapeake silt loam, 2 to 5 percent slopes
MpA	1	Mattapex fine sandy loam, 0 to 2 percent slopes
MpB	1	Mattapex fine sandy loam, 2 to 5 percent slopes
MqA	1	Mattapex silt loam, 0 to 2 percent slopes
MqB	1	Mattapex silt loam, 2 to 5 percent slopes
NnA	1	Nassawango fine sandy loam, 0 to 2 percent slopes
NnB	1	Nassawango fine sandy loam, 2 to 5 percent slopes
NsA	1	Nassawango silt loam, 0 to 2 percent slopes
NsB	1	Nassawango silt loam, 2 to 5 percent slopes
RoA	4	Rosedale loamy sand, 0 to 2 percent slopes
RoB	4	Rosedale loamy sand, 2 to 5 percent slopes
SaA	1	Sassafras sandy loam, 0 to 2 percent slopes
SaB	1	Sassafras sandy loam, 2 to 5 percent slopes
WdA	1	Woodstown sandy loam, 0 to 2 percent slopes
WdB	1	Woodstown sandy loam, 2 to 5 percent slopes

* Description of prime farmland codes:
1--All areas of the map unit are prime farmland.
2--Only drained areas of the map unit are prime farmland.
4--Only irrigated areas of the map unit are prime farmland.

Table 10.—Soils of Statewide Importance

Map symbol	Soil name	Acres in survey area
CeA	Cedartown-Rosedale complex, 0 to 2 percent slopes	3,205
CeB	Cedartown-Rosedale complex, 2 to 5 percent slopes	4,283
EvA	Evesboro loamy sand, 0 to 2 percent slopes	928
EvB	Evesboro loamy sand, 2 to 5 percent slopes	2,865
Fa	Fallsington sandy loam	29,244
FmA	Fort Mott loamy sand, 0 to 2 percent slopes	731
FmB	Fort Mott loamy sand, 2 to 5 percent slopes	2,507
GaA	Galestown loamy sand, 0 to 2 percent slopes	886
GaB	Galestown loamy sand, 2 to 5 percent slopes	1,885
HbA	Hambrook sandy loam, 0 to 2 percent slopes	7,488
HbB	Hambrook sandy loam, 2 to 5 percent slopes	4,383
HmA	Hammonton loamy sand, 0 to 2 percent slopes	5,680
HmB	Hammonton loamy sand, 2 to 5 percent slopes	2,096
Hu	Hurlock loamy sand	10,586
Ke	Kentuck silt loam	11,238
Mu	Mullica-Berryland complex	26,581
Ot	Othello silt loam	40,379
RoA	Rosedale loamy sand, 0 to 2 percent slopes	1,743
RoB	Rosedale loamy sand, 2 to 5 percent slopes	2,170
RuA	Runclint loamy sand, 0 to 2 percent slopes	1,799
RuB	Runclint loamy sand, 2 to 5 percent slopes	3,993

Table 11.—Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
AcB, AcC------- Acquango	5S	Slight	Moderate	Severe	Slight	Slight	Pitch pine---------	---	---	Loblolly pine.
							Loblolly pine------	60	5	
As------------- Askecksy	2W	Slight	Severe	Severe	Moderate	Severe	Sweetgum-----------	80	6	Loblolly pine, Virginia pine.
							White oak----------	70	4	
							Loblolly pine------	90	8	
							Virginia pine------	70	8	
Bh------------- Berryland	4W	Slight	Severe	Severe	Severe	Severe	Pitch pine---------	60	---	Loblolly pine.
BkA, BkB------- Brockatonorton	5S	Slight	Slight	Severe	Moderate	Moderate	Pitch pine---------	---	---	American holly, loblolly pine.
							American holly-----	---	---	
							Loblolly pine------	60	5	
CeA, CeB:										
Cedartown-----	8S	Slight	Slight	Moderate	Slight	Moderate	Yellow-poplar------	90	6	Loblolly pine, Virginia pine, shortleaf pine.
							White oak----------	75	4	
							Loblolly pine------	85	8	
							Virginia pine------	70	8	
Rosedale------	2A	Slight	Slight	Moderate	Slight	Slight	White oak----------	70	4	Virginia pine, loblolly pine.
							Scarlet oak--------	70	4	
							Black oak----------	65	3	
							Virginia pine------	70	8	
Ch------------- Chicone	2W	Slight	Severe	Severe	Severe	Severe	Red maple----------	50	2	Atlantic white-cedar, baldcypress.
							Sweetgum-----------	50	4	
							Water oak----------	50	2	
							Pin oak------------	50	2	
Ek------------- Elkton	8W	Slight	Severe	Slight	Slight	Slight	Red maple----------	---	---	Loblolly pine.
							Sweetgum-----------	80	6	
							Blackgum-----------	---	---	
							Southern red oak---	---	---	
							Willow oak---------	---	---	
							Loblolly pine------	78	8	
Em------------- Elkton	8W	Slight	Severe	Slight	Slight	Slight	Red maple----------	---	---	Loblolly pine.
							Sweetgum-----------	80	6	
							Blackgum-----------	---	---	
							Southern red oak---	---	---	
							Willow oak---------	---	---	
							Loblolly pine------	78	8	
EvA, EvB, EvC-- Evesboro	6S	Slight	Moderate	Slight	Slight	Slight	Shortleaf pine-----	60	6	Virginia pine, loblolly pine.
							Pitch pine---------	60	---	
							White oak----------	70	4	
							Chestnut oak-------	70	4	
							Black oak----------	70	4	
							Virginia pine------	70	8	

See footnote at end of table.

Table 11.—Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
Fa------------- Fallsington	9W	Slight	Moderate	Moderate	Moderate	Severe	White oak---------- Willow oak--------- Sweetgum----------- Loblolly pine------	--- --- 80 90	--- --- 6 9	Sweetgum, loblolly pine, yellow-poplar, eastern white pine.
FmA, FmB------- Fott Mott	8A	Slight	Moderate	Slight	Slight	Slight	Shortleaf pine----- Pitch pine--------- White oak---------- Black oak---------- Virginia pine------	70 --- 70 70 70	8 --- 4 4 8	Virginia pine, loblolly pine.
GaA, GaB, GaC-- Galestown	4S	Slight	Moderate	Moderate	Slight	Moderate	Black oak---------- Shortleaf pine----- Loblolly pine------ Virginia pine------	70 70 80 70	4 8 8 8	Shortleaf pine, loblolly pine, Virginia pine.
HbA, HbB------- Hambrook	8A	Slight	Slight	Slight	Slight	Slight	Virginia pine------ White oak---------- Scarlet oak-------- Black oak---------- Loblolly pine------	70 70 70 65 75	8 4 4 3 7	Loblolly pine.
HmA, HmB------- Hambrook	4A	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine----- Pitch pine--------- White oak---------- Black oak---------- Loblolly pine------ Virginia pine------	70 80 80 80 60 70	8 8 4 4 5 8	Loblolly pine, Virginia pine.
Hu------------- Hurlock	8W	Slight	Severe	Moderate	Moderate	Severe	Red maple---------- White oak---------- Willow oak--------- Loblolly pine------	70 70 70 85	3 4 4 8	Loblolly pine, yellow-poplar.
In------------- Indiantown	3W	Slight	Severe	Severe	Severe	Severe	Red maple---------- Blackgum----------- Water oak---------- Baldcypress--------	60 60 70 100	3 3 4 6	Baldcypress, Atlantic white-cedar.
Ke------------- Kentuck	3W	Slight	Severe	Severe	Severe	Severe	Red maple---------- Sweetgum----------- Swamp chestnut oak- Water oak---------- Willow oak--------- Loblolly pine------	70 70 60 70 70 70	3 4 4 4 4 6	Loblolly pine.
KsA, KsB------- Klej	8S	Slight	Moderate	Moderate	Slight	Moderate	Sweetgum----------- White oak---------- Loblolly pine------ Virginia pine------	80 70 80 70	6 4 8 8	Loblolly pine, Virginia pine, eastern white pine.
Ma------------- Manahawkin	3W	Slight	Severe	Severe	Severe	Severe	Red maple---------- Atlantic white-cedar------- Sweetgum----------- Blackgum-----------	75 50 75 60	3 --- 5 3	Atlantic white-cedar, baldcypress.

See footnote at end of table.

Table 11.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
MeA, MeB, MkA, MkB----------- Matapeake	4A	Slight	Slight	Slight	Slight	Severe	Virginia pine------	75	8	Yellow-poplar, loblolly pine, sweetgum, eastern white pine.
							White oak----------	75	4	
							Yellow-poplar------	90	6	
							Loblolly pine------	80	8	
MpA, MpB, MqA, MqB----------- Mattapex	4A	Slight	Slight	Moderate	Slight	Moderate	Sweetgum-----------	80	6	Loblolly pine, yellow-poplar, eastern white pine.
							Virginia pine------	70	8	
							White oak----------	70	4	
							Northern red oak---	70	4	
							Loblolly pine------	81	8	
Mu: Mullica-------	5W	Slight	Severe	Severe	Moderate	Moderate	Pin oak------------	85	5	Sweetgum.
							Sweetgum-----------	90	7	
Berryland-----	4W	Slight	Severe	Severe	Severe	Severe	Pitch pine---------	60	---	
NnA, NnB, NsA, NsB----------- Nassawango	8A	Slight	Slight	Slight	Slight	Slight	Yellow-poplar------	90	6	Loblolly pine.
							White oak----------	75	4	
							Loblolly pine------	85	8	
Ot------------- Othello	4W	Slight	Severe	Severe	Slight	Severe	Red maple----------	50	2	Loblolly pine.
							Sweetgum-----------	80	6	
							White oak----------	80	4	
							Loblolly pine------	83	8	
Pk------------- Puckum	2W	Slight	Severe	Severe	Severe	Severe	Red maple----------	50	2	Atlantic white-cedar, baldcypress.
							Sweetgum-----------	60	4	
							Blackgum-----------	60	6	
							Swamp chestnut oak-	60	---	
							Water oak----------	60	3	
							Northern whitecedar	60	6	
RoA, RoB------- Rosedale	2A	Slight	Slight	Moderate	Slight	Slight	White oak----------	70	4	Virginia pine, loblolly pine.
							Scarlet oak--------	70	4	
							Black oak----------	65	3	
							Virginia pine------	70	8	
RuA, RuB------- Runclint	6S	Slight	Slight	Moderate	Slight	Slight	Virginia pine------	60	6	Loblolly pine.
							White oak----------	55	3	
							Northern red oak---	70	4	
							Black oak----------	70	4	
							Loblolly pine------	70	6	
SaA, SaB, SaC-- Sassafras	4A	Slight	Slight	Slight	Slight	Slight	Virginia pine------	70	8	Yellow-poplar, loblolly pine, eastern white pine.
							White oak----------	70	4	
							Yellow-poplar------	80	5	
							Loblolly pine------	85	8	
Su------------- Sunken	5T	Slight	Severe	Severe	Severe	Severe	Loblolly pine------	40	5	Baldcypress.

See footnote at end of table.

Table 11.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	Trees to plant
		Management concerns					Potential productivity			
Uc:										
Urban land.										
Acquango------	5S	Slight	Moderate	Severe	Slight	Slight	Pitch pine---------	---	---	Loblolly pine.
							Loblolly pine------	60	5	
Um:										
Urban land.										
Askecksy------	2W	Slight	Severe	Severe	Moderate	Severe	Sweetgum-----------	80	6	Loblolly pine, Virginia pine.
							White oak----------	70	4	
							Loblolly pine------	90	8	
							Virginia pine------	70	8	
Un:										
Urban land.										
Brockatonorton	5S	Slight	Slight	Severe	Moderate	Moderate	Pitch pine---------	---	---	American holly, loblolly pine.
							American holly-----	---	---	
							Loblolly pine------	60	5	
Ut:										
Urban land.										
Udorthents----	4W	Slight	Moderate	Moderate	Slight	Severe	Red maple----------	40	2	Loblolly pine.
							Sweetgum-----------	40	4	
							Willow oak---------	50	2	
							Loblolly pine------	60	5	
Uz------------- Udorthents	4W	Slight	Moderate	Moderate	Slight	Severe	Red maple----------	40	2	Loblolly pine.
							Sweetgum-----------	40	4	
							Willow oak---------	50	2	
							Loblolly pine------	60	5	
WdA, WdB------- Woodstown	4A	Slight	Slight	Slight	Slight	Moderate	Sweetgum-----------	90	7	Yellow-poplar, loblolly pine, eastern white pine.
							White oak----------	80	4	
							Northern red oak---	---	---	
							Yellow-poplar------	90	6	
							Loblolly pine------	85	8	
Zk------------- Zekiah	3W	Slight	Severe	Severe	Moderate	Severe	Red maple----------	60	3	Eastern white pine, American sycamore.
							Sweetgum-----------	80	6	
							Water oak----------	70	4	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 12.—Recreational Development

(Some terms that describe restrictive features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe")

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
AcB: Acquango	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
AcC: Acquango	Severe: flooding, too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
As: Askecksy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Be: Beaches	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy, excess salt.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.
Bh: Berryland	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
BkA, BkB: Brockatonorton	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Br: Broadkill	Severe: flooding, ponding, excess salt.	Severe: ponding, excess salt, too acid.	Severe: ponding, flooding, excess salt.	Severe: ponding.
BX:				
Boxiron	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
Broadkill	Severe: flooding, ponding, excess salt.	Severe: ponding, excess salt, too acid.	Severe: ponding, flooding, excess salt.	Severe: ponding.
CeA:				
Cedartown	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.
Rosedale	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: too sandy, percs slowly.	Moderate: too sandy.
CeB:				
Cedartown	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
Rosedale	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: slope, too sandy, percs slowly.	Moderate: too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
Ch---------------- Chicone	Severe: flooding, ponding, too acid.	Severe: ponding, too acid.	Severe: ponding, too acid.	Severe: ponding.
Ek, Em------------ Elkton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
EvA--------------- Evesboro	Slight--------	Slight---------	Moderate: small stones.	Slight.
EvB--------------- Evesboro	Slight--------	Slight---------	Moderate: slope, small stones.	Slight.
EvC--------------- Evesboro	Slight--------	Slight---------	Severe: slope.	Slight.
Fa---------------- Fallsington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
FmA--------------- Fott Mott	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.
FmB--------------- Fott Mott	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
GaA--------------- Galestown	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.
GaB--------------- Galestown	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.
GaC--------------- Galestown	Moderate: too sandy.	Moderate: too sandy.	Severe: slope.	Moderate: too sandy.
HbA--------------- Hambrook	Slight--------	Slight---------	Moderate: small stones.	Slight.
HbB--------------- Hambrook	Slight--------	Slight---------	Moderate: slope, small stones.	Slight.
HmA, HmB---------- Hammonton	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Hu---------------- Hurlock	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
In---------------- Indiantown	Severe: flooding, ponding, too acid.	Severe: ponding, too acid.	Severe: ponding, flooding, too acid.	Severe: ponding.
Ke---------------- Kentuck	Severe: ponding, too acid.	Severe: ponding, too acid.	Severe: ponding, too acid.	Severe: ponding.

Table 12.—Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
KsA: Klej	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness, too sandy.
KsB: Klej	Severe: wetness.	Moderate: wetness, too sandy.	Severe: wetness.	Moderate: wetness, too sandy.
Ma: Manahawkin	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, too acid.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
MC:				
Mannington	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.
Nanticoke	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.
MeA: Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
MeB: Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
MkA: Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
MkB: Matapeake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
MpA: Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
MpB: Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.
MqA: Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
MqB: Mattapex	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.
Mu:				
Mullica	Severe: flooding, wetness, too acid.	Severe: wetness, too acid.	Severe: wetness, too acid.	Severe: wetness.
Berryland	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
NnA, NnB, NsA, NsB Nassawango	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
Ot Othello	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pk Puckum	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, too acid.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
Pu Purnell	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
RoA Rosedale	Moderate: percs slowly, too sandy.	Moderate: too sandy, percs slowly.	Moderate: too sandy, percs slowly.	Moderate: too sandy.
RoB Rosedale	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
RuA, RuB Runclint	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
SaA Sassafras	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones, percs slowly.	Slight.
SaB Sassafras	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight.
SaC Sassafras	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight.
Su Sunken	Severe: flooding, ponding, excess salt.	Severe: ponding, excess salt.	Severe: ponding, excess salt.	Severe: ponding.
Tk Transquaking	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
TP: Transquaking	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
Mispillion	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.
Uc: Urban land	Variable	Variable	Variable	Variable.

Table 12.—Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails
Uc:				
Acquango	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Um:				
Urban land	Variable	Variable	Variable	Variable.
Askecksy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Un:				
Urban land	Variable	Variable	Variable	Variable.
Brockatonorton	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Ur Urban land	Variable	Variable	Variable	Variable.
Ut:				
Urban land	Variable	Variable	Variable	Variable.
Udorthents	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.
Uz Udorthents	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.
WdA Woodstown	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
WdB Woodstown	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.
Zk Zekiah	Severe: flooding, wetness, too acid.	Severe: wetness, too acid.	Severe: wetness, flooding, too acid.	Severe: wetness.

Table 13.—Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water plants	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
AcB, AcC: Acquango	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
As: Askecksy	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Fair	Poor	Fair.
Be: Beaches	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Bh: Berryland	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
BkA, BkB: Brockatonorton	Poor	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Poor.
Br: Broadkill	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
BX:										
Boxiron	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Broadkill	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
CeA, CeB:										
Cedartown	Poor	Fair	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor.
Rosedale	Poor	Fair	Fair	Poor	Fair	Poor	Very poor.	Fair	Fair	Very poor.
Ch: Chicone	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.
Ek: Elkton	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Em: Elkton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
EvA, EvB, EvC: Evesboro	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Fa: Fallsington	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
FmA, FmB: Fort Mott	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
GaA, GaB, GaC: Galestown	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
HbA, HbB: Hambrook	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HmA, HmB: Hammonton	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water plants	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Hu------------- Hurlock	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
In------------- Indiantown	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.
Ke------------- Kentuck	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.
KsA, KsB------- Klej	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
Ma------------- Manahawkin	Very poor.	Poor	Poor	Poor	Poor	Good	Poor	Poor	Poor	Fair.
MC:										
Mannington----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Nanticoke-----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
MeA------------ Matapeake	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MeB------------ Matapeake	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MkA------------ Matapeake	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MkB------------ Matapeake	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MpA------------ Mattapex	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MpB------------ Mattapex	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MqA------------ Mattapex	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MqB------------ Mattapex	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Mu:										
Mullica-------	Very poor.	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair.
Berryland-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
NnA, NnB, NsA, NsB----------- Nassawango	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Poor.
Ot------------- Othello	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 13.—Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water plants	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Pk------------- Puckum	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
RoA, RoB------- Rosedale	Poor	Fair	Fair	Poor	Fair	Poor	Very poor.	Fair	Fair	Very poor.
RuA, RuB------- Runclint	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
SaA, SaB------- Sassafras	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SaC------------ Sassafras	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Su------------- Sunken	Very poor.	Poor	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Tk------------- Transquaking	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
TP:										
Transquaking--	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Mispillion----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Uc:										
Urban land.										
Acquango------	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
Um:										
Urban land.										
Askecksy------	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Fair	Poor	Fair.
Un:										
Urban land.										
Brockatonorton	Poor	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Poor.
Ut:										
Urban land.										
Udorthents----	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Poor	Fair	Fair.
Uz------------- Udorthents	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Poor	Fair	Fair.
WdA------------ Woodstown	Fair	Good	Good	Good	Poor	Poor	Poor	Good	Good	Poor.
WdB------------ Woodstown	Fair	Good	Good	Good	Poor	Poor	Very poor.	Good	Good	Very poor.
Zk------------- Zekiah	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.

Table 14.—Building Site Development

(Some terms that describe restrictive soil features are described in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns, landscaping, and golf fairways
AcB, AcC: Acquango	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: droughty.
As: Askecksy	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Be: Beaches	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, wetness, droughty.
Bh: Berryland	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.
BkA, BkB: Brockatonorton	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
Br: Broadkill	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, too acid, excess sulfur.
BX:						
Boxiron	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
Broadkill	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, too acid, excess sulfur.
CeA, CeB:						
Cedartown	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Rosedale	Severe: cutbanks cave.	Slight	Moderate: wetness, shrink-swell.	Slight	Slight	Moderate: droughty.
Ch: Chicone	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: too acid, ponding.
Ek, Em: Elkton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
EvA, EvB: Evesboro	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.

Table 14.—Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns, landscaping, and golf fairways
EvC: Evesboro	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
Fa: Fallsington	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
FmA, FmB: Fott Mott	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Moderate: droughty.
GaA, GaB: Galestown	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
GaC: Galestown	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
HbA, HbB: Hambrook	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Slight.
HmA, HmB: Hammonton	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Severe: too acid.
Hu: Hurlock	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
In: Indiantown	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: too acid, ponding, flooding.
Ke: Kentuck	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: too acid, ponding.
KsA, KsB: Klej	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
Ma: Manahawkin	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: too acid, ponding, flooding.
MC:						
Mannington	Severe: excess humus, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Nanticoke	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
MeA, MeB, MkA, MkB: Matapeake	Severe: cutbanks cave.	Slight	Slight	Slight	Severe: low strength.	Slight.
MpA, MpB, MqA, MqB: Mattapex	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.

Table 14.—Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns, landscaping, and golf fairways
Mu:						
Mullica	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, frost action.	Severe: too acid, wetness, droughty.
Berryland	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, droughty.
NnA, NnB, NsA, NsB Nassawango	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Severe: low strength.	Moderate: small stones.
Ot Othello	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Pk Puckum	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: too acid, ponding, flooding.
Pu Purnell	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
RoA Rosedale	Severe: cutbanks cave.	Slight	Moderate: wetness, shrink-swell.	Slight	Slight	Moderate: droughty.
RoB Rosedale	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
RuA, RuB Runclint	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
SaA, SaB Sassafras	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
SaC Sassafras	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Su Sunken	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, ponding.
Tk Transquaking	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
TP:						
Transquaking	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: excess salt, excess sulfur, ponding.

Table 14.—Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns, landscaping, and golf fairways
TP:						
Mispillion	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
Uc:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Acquango	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: droughty.
Um:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Askecksy	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Un:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Brockatonorton	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
Ur Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Ut:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Udorthents	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Uz Udorthents	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
WdA, WdB Woodstown	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
Zk Zekiah	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: too acid, wetness, flooding.

Table 15.—Sanitary Facilities

(Some terms that describe soil restrictions are defined in the Glossary. See text for definitions of "moderate," "good," and other terms. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AcB: Acquango	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
AcC: Acquango	Severe: flooding, poor filter.	Severe: seepage, flooding, slope.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
As: Askecksy	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Be: Beaches	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Bh: Berryland	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
BkA, BkB: Brockatonorton	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Br: Broadkill	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess salt.
BX:					
Boxiron	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
Broadkill	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess salt.
CeA, CeB:					
Cedartown	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Rosedale	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: too sandy.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ch------------- Chicone	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
Ek, Em--------- Elkton	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
EvA, EvB------- Evesboro	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
EvC------------ Evesboro	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
Fa------------- Fallsington	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
FmA------------ Fort Mott	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
FmB------------ Fort Mott	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
GaA, GaB------- Galestown	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
GaC------------ Galestown	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
HbA------------ Hambrook	Severe: percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Good.
HbB------------ Hambrook	Severe: percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Good.
HmA, HmB------- Hammonton	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness. too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
Hu------------- Hurlock	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness:	Poor: wetness.
In------------- Indiantown	Severe: flooding, ponding.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ke------------- Kentuck	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
KsA------------ Klej	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
KsB------------ Klej	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Ma------------- Manahawkin	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus, too acid.
MC:					
Mannington----	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
Nanticoke-----	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
MeA, MeB, MkA, MkB----------- Matapeake	Severe: percs slowly.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
MpA, MpB, MqA, MqB----------- Mattapex	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: too clayey, wetness, thin layer.
Mu:					
Mullica-------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Berryland-----	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
NnA, NnB------- Nassawango	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy, too acid.	Severe: seepage.	Poor: seepage, too sandy, too acid.
NsA------------ Nassawango	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: too sandy, too acid.	Severe: seepage.	Poor: seepage, too sandy, too acid.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NsB------------ Nassawango	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: too acid.	Severe: seepage.	Poor: too acid.
Ot------------- Othello	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Pk------------- Puckum	Severe: flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus, too acid.
Pu------------- Purnell	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
RoA------------ Rosedale	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: too sandy.
RoB------------ Rosedale	Severe: percs slowly.	Severe: seepage.	Severe: seepage, wetness, too acid.	Severe: seepage.	Poor: too acid.
RuA, RuB------- Runclint	Severe: poor filter.	Severe: seepage.	Severe: wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
SaA, SaB------- Sassafras	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
SaC------------ Sassafras	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Su------------- Sunken	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding.
Tk------------- Transquaking	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus, excess salt.
TP:					
Transquaking--	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus, excess salt.
Mispillion----	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.

Table 15.—Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Uc:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Acquango	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
Um:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Askecksy	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Un:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Brockatonorton	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Ur: Urban land	Variable	Variable	Variable	Variable	Variable.
Ut:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Udorthents	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Uz: Udorthents	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
WdA, WdB: Woodstown	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: thin layer.
Zk: Zekiah	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, too acid.

Table 16.—Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AcB, AcC: Acquango	Good	Probable	Improbable: too sandy.	Poor: too sandy.
As: Askecksy	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Be: Beaches	Poor: wetness.	Probable	Improbable: too sandy.	Poor: area reclaim, too sandy, excess salt.
Bh: Berryland	Poor: wetness.	Probable	Improbable: too sandy.	Poor: thin layer, wetness.
BkA, BkB: Brockatonorton	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Br: Broadkill	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
BX:				
Boxiron	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess salt, wetness.
Broadkill	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
CeA, CeB:				
Cedartown	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: thin layer.
Rosedale	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, thin layer.
Ch: Chicone	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness, too acid.
Ek, Em: Elkton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
EvA, EvB, EvC: Evesboro	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, small stones.
Fa: Fallsington	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
FmA, FmB: Fort Mott	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
GaA: Galestown	Good	Probable	Improbable: too sandy.	Poor: too sandy.
GaB: Galestown	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.
GaC: Galestown	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, area reclaim.
HbA, HbB: Hambrook	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
HmA, HmB: Hammonton	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim, too acid.
Hu: Hurlock	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
In: Indiantown	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too acid.
Ke: Kentuck	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too acid.
KsA: Klej	Fair: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
KsB: Klej	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.
Ma: Manahawkin	Poor: wetness.	Probable	Probable	Poor: excess humus, area reclaim, wetness.
MC:				
Mannington	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Nanticoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MeA, MeB, MkA, MkB: Matapeake	Good	Probable	Improbable: too sandy.	Fair: area reclaim, too clayey, thin layer.
MpA, MpB, MqA, MqB: Mattapex	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too clayey.

Table 16.—Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Mu:				
Mullica	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, wetness.
Berryland	Poor: wetness.	Probable	Improbable: too sandy.	Poor: thin layer, wetness.
NnA, NnB Nassawango	Good	Probable	Improbable: too sandy.	Poor: too acid.
NsA Nassawango	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too acid.
NsB Nassawango	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too acid.
Ot Othello	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Pk Puckum	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness, too acid.
Pu Purnell	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, excess salt, wetness.
RoA Rosedale	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, thin layer.
RoB Rosedale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones, thin layer.
RuA Runclint	Good	Probable	Improbable: thin layer.	Poor: small stones.
RuB Runclint	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
SaA, SaB, SaC Sassafras	Good	Probable	Probable	Fair: too clayey, small stones, area reclaim.
Su Sunken	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
Tk Transquaking	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, excess salt, wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
TP:				
Transquaking-----	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, excess salt, wetness.
Mispillion-------	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, excess salt, wetness.
Uc:				
Urban land-------	Variable------	Variable------	Variable------	Variable.
Acquango---------	Good----------	Probable------	Improbable: too sandy.	Poor: too sandy.
Um:				
Urban land-------	Variable------	Variable------	Variable------	Variable.
Askecksy---------	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy, wetness.
Un:				
Urban land-------	Variable------	Variable------	Variable------	Variable.
Brockatonorton---	Fair: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy.
Ur--------------- Urban land	Variable------	Variable------	Variable------	Variable.
Ut:				
Urban land-------	Variable------	Variable------	Variable------	Variable.
Udorthents-------	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy, wetness.
Uz--------------- Udorthents	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy, wetness.
WdA, WdB---------- Woodstown	Fair: wetness.	Probable------	Improbable: too sandy.	Poor: small stones.
Zk--------------- Zekiah	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: wetness, too acid.

Table 17.--Water Management

(Some terms that describe restrictive soil features are described in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
AcB, AcC: Acquango	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Excess salt, droughty, rooting depth.
As: Askecksy	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
Be: Beaches	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: salty water, cutbanks cave.	Flooding, slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, excess salt, droughty.
Bh: Berryland	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy.	Wetness, droughty.
BkA: Brockatonorton	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Excess salt, droughty, rooting depth.
BkB: Brockatonorton	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding, slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Excess salt, droughty, rooting depth.
Br: Broadkill	Severe: seepage.	Severe: ponding, excess salt.	Severe: slow refill, salty water, cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding	Wetness, excess salt.
BX:							
Boxiron	Moderate: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding	Wetness, excess salt.
Broadkill	Severe: seepage.	Severe: ponding, excess salt.	Severe: slow refill, salty water, cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding	Wetness, excess salt.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
CeA:							
Cedartown	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
Rosedale	Severe: seepage.	Severe: seepage, piping.	Severe: slow refill, cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
CeB:							
Cedartown	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Rosedale	Severe: seepage.	Severe: seepage, piping.	Severe: slow refill, cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty, rooting depth.
Ch: Chicone	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, flooding, too acid.	Erodes easily, ponding, too sandy.	Wetness, erodes easily.
Ek: Elkton	Slight	Severe: piping, wetness.	Severe: slow refill.	Percs slowly	Wetness, soil blowing, percs slowly.	Erodes easily, wetness, soil blowing.	Wetness, erodes easily, percs slowly.
Em: Elkton	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
EvA: Evesboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
EvB, EvC: Evesboro	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Fa: Fallsington	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, soil blowing, rooting depth.	Wetness, too sandy, soil blowing.	Wetness, rooting depth.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
FmA: Fott Mott	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing	Droughty, rooting depth.
FmB: Fott Mott	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Soil blowing	Droughty, rooting depth.
GaA: Galestown	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
GaB, GaC: Galestown	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
HbA: Hambrook	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Deep to water	Percs slowly	Erodes easily	Erodes easily.
HbB: Hambrook	Moderate: seepage, slope.	Severe: piping.	Severe: slow refill.	Deep to water	Slope, percs slowly.	Erodes easily	Erodes easily.
HmA: Hammonton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave, too acid.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty, rooting depth.
HmB: Hammonton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty, rooting depth.
Hu: Hurlock	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly	Wetness, droughty, fast intake.	Erodes easily, wetness, soil blowing.	Wetness, erodes easily, droughty.
In: Indiantown	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, erodes easily, flooding.	Erodes easily, ponding, too sandy.	Wetness, erodes easily.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
Ke---------------- Kentuck	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly, cutbanks cave.	Ponding, percs slowly, rooting depth.	Erodes easily, ponding, too sandy.	Wetness, erodes easily, rooting depth.
KsA--------------- Klej	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
KsB--------------- Klej	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
Ma---------------- Manahawkin	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing.	Wetness.
MC:							
Mannington-------	Severe: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, flooding.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
Nanticoke--------	Slight----------	Severe: piping, ponding.	Severe: slow refill.	Ponding, flooding.	Ponding, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
MeA--------------- Matapeake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Soil blowing, rooting depth, erodes easily.	Erodes easily, too sandy, soil blowing.	Erodes easily, rooting depth.
MeB--------------- Matapeake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Erodes easily, too sandy, soil blowing.	Erodes easily, rooting depth.
MkA--------------- Matapeake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Rooting depth, erodes easily.	Erodes easily, too sandy.	Erodes easily, rooting depth.
MkB--------------- Matapeake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily, too sandy.	Erodes easily, rooting depth.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
MpA: Mattapex	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, soil blowing, erodes easily.	Erodes easily, wetness, soil blowing.	Erodes easily.
MpB: Mattapex	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Slope	Slope, wetness, soil blowing.	Erodes easily, wetness, soil blowing.	Erodes easily.
MqA: Mattapex	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
MqB: Mattapex	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Slope	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Mu: Mullica	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave, too acid.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Berryland	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy.	Wetness, droughty.
NnA: Nassawango	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Rooting depth, erodes easily, too acid.	Erodes easily, too sandy.	Erodes easily, rooting depth.
NnB: Nassawango	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily, too sandy.	Erodes easily, rooting depth.
NsA: Nassawango	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Rooting depth, erodes easily, too acid.	Erodes easily, too sandy.	Erodes easily, rooting depth.
NsB: Nassawango	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ot: Othello	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, rooting depth, erodes easily.	Erodes easily, wetness, too sandy.	Wetness, erodes easily, rooting depth.
Pk: Puckum	Severe: seepage.	Severe: excess humus, ponding.	Slight	Ponding, flooding, subsides.	Ponding, flooding, too acid.	Ponding	Wetness.
Pu: Purnell	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding, too sandy.	Wetness, excess salt.
RoA: Rosedale	Severe: seepage.	Severe: seepage, piping.	Severe: slow refill, cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
RoB: Rosedale	Severe: seepage.	Severe: piping.	Severe: slow refill, cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Soil blowing	Droughty, rooting depth.
RuA: Runclint	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
RuB: Runclint	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty, rooting depth.
SaA: Sassafras	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Soil blowing	Erodes easily, too sandy, soil blowing.	Erodes easily.
SaB, SaC: Sassafras	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Erodes easily, too sandy, soil blowing.	Erodes easily.
Su: Sunken	Moderate: seepage.	Severe: piping, ponding, excess salt.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly, flooding.	Ponding, percs slowly, rooting depth.	Erodes easily, ponding.	Wetness, excess salt, erodes easily.
Tk: Transquaking	Severe: seepage.	Severe: excess humus, ponding, excess salt.	Severe: slow refill, salty water.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding	Wetness, excess salt.

Table 17.—Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
TP:							
Transquaking----	Severe: seepage.	Severe: excess humus, ponding, excess salt.	Severe: slow refill, salty water.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding--------	Wetness, excess salt.
Mispillion------	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, flooding, subsides.	Ponding, flooding, excess salt.	Ponding--------	Wetness, excess salt.
Uc:							
Urban land------	Variable-------	Variable------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Acquango--------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Excess salt, droughty, rooting depth.
Um:							
Urban land------	Variable-------	Variable------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Askecksy--------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
Un:							
Urban land------	Variable-------	Variable------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Brockatonorton--	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Excess salt, droughty, rooting depth.
Ur-------------- Urban land	Variable-------	Variable------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Ut:							
Urban land------	Variable-------	Variable------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Udorthents------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Uz: Udorthents	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
WdA: Woodstown	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, droughty, soil blowing.	Wetness, soil blowing.	Droughty.
WdB: Woodstown	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Slope	Slope, wetness, droughty.	Wetness, soil blowing.	Droughty.
Zk: Zekiah	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, too acid.	Wetness, droughty, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, droughty.

Table 18.—Engineering Index Properties, Part I

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification	
			Unified	AASHTO
	In			
AcB--------------	0-3	S	SP, SP-SM	A-1, A-3
Acquango	3-20	S COS FS	SP, SP-SM	A-1, A-3
	20-26	S COS FS	SP, SP-SM	A-1, A-3
	26-72	S COS FS	SP, SP-SM	A-1, A-3
AcC--------------	0-3	S	SP, SP-SM	A-1, A-3
Acquango	3-20	S COS FS	SP, SP-SM	A-1, A-3
	20-26	S COS FS	SP, SP-SM	A-1, A-3
	26-72	S COS FS	SP, SP-SM	A-1, A-3
As---------------	0-10	LS	SP-SM	A-2, A-3
Askecksy	10-34	S LS LFS	SP-SM, SM	A-2, A-3
	34-72	COS S FS	SP, SP-SM	A-1, A-3, A-2-4
Be---------------	0-6	S	SP	A-1, A-3
Beaches	6-60	COS S FS	SP	A-1, A-3
Bh---------------	0-12	MK-LS	SP, SP-SM	A-3
Berryland	12-20	S LS	SP, SP-SM	A-2, A-3
	20-30	S	SP, SP-SM	A-3
	30-40	S LS	SP, SM, SC-SM, SP-SM	A-1, A-2, A-3
	40-72	SR S SL	SP, SM, SC-SM, SP-SM	A-1, A-2, A-3, A-4
BkA--------------	0-3	S	SP, SP-SM	A-1, A-3
Brockatonorton	3-24	S FS COS	SP, SP-SM	A-1, A-3
	24-50	S FS COS	SP, SP-SM	A-1, A-3
	50-60	MPT Muck	PT	A-8
	60-72	S LS	SP, SP-SM	A-1, A-3
BkB--------------	0-3	S	SP, SP-SM	A-1, A-3
Brockatonorton	3-24	S FS COS	SP, SP-SM	A-1, A-3
	24-50	S FS COS	SP, SP-SM	A-1, A-3
	50-60	MPT Muck	PT	A-8
	60-72	S LS	SP, SP-SM	A-1, A-3
Br---------------	0-6	MK-SIL	OL, ML, CL-ML	A-4, A-8
Broadkill	6-38	SIL SICL	CL	A-6, A-7-6
	38-72	SR SICL S	CL, ML, SC, SM	A-2, A-4, A-6
BX:				
Boxiron---------	0-14	MPT	PT	A-8
	14-30	SIL SICL MK-SIL	CL	A-6, A-7
	30-74	SIL SICL	CL	A-6
	74-80	LS S	SP-SM, SM	A-3, A-2-4
Broadkill-------	0-6	MK-SIL	OL, ML, CL-ML	A-4, A-8
	6-38	SIL SICL	CL	A-6, A-7-6
	38-72	SR SICL S	CL, ML, SC, SM	A-2, A-4, A-6
CeA:				
Cedartown-------	0-6	LS	SM, SP-SM	A-2, A-3
	6-14	LS S	SM, SP-SM	A-2, A-3
	14-30	LS	SM, SP-SM	A-1, A-2
	30-42	LS S	SM, SP-SM	A-2, A-3
	42-64	S	SM, SP-SM	A-1, A-3
	64-72	FSL SIL	CL-ML, SC-SM	A-4

Table 18.--Engineering Index Properties, Part I--Continued

Map symbol and soil name	Depth	USDA texture	Classification Unified	Classification AASHTO
	In			
CeA:				
Rosedale--------	0-22	LS	SM, SP-SM	A-1, A-2
	22-38	L	ML, CL, CL-ML	A-4
	38-72	SR COS SICL	SM, SC, ML, CL	A-1, A-2, A-4, A-6
CeB:				
Cedartown-------	0-6	LS	SM, SP-SM	A-2, A-3
	6-14	LS S	SM, SP-SM	A-2, A-3
	14-30	LS	SM, SP-SM	A-1, A-2
	30-42	LS S	SM, SP-SM	A-2, A-3
	42-64	S	SM, SP-SM	A-1, A-3
	64-72	FSL SIL	CL-ML, SC-SM	A-4
Rosedale---------	0-22	LS	SM, SP-SM	A-1, A-2
	22-38	L	ML, CL, CL-ML	A-4
	38-72	SR COS SICL	SM, SC, ML, CL	A-1, A-2, A-4, A-6
Ch--------------- Chicone	0-10	MK-SIL	OL, ML, CL-ML	A-4, A-8
	10-18	SIL	ML, CL-ML, CL	A-4
	18-30	Muck MPT	PT	A-8
	30-72	S LS	SM, SP-SM	A-2, A-1
Ek--------------- Elkton	0-15	SL	SM, SC-SM	A-4
	15-36	SICL	CL	A-6
	36-72	VFSL	SC, ML, CL	A-4
Em--------------- Elkton	0-20	SIL	ML, CL-ML	A-4, A-6
	20-47	SICL	CL	A-6
	47-58	SICL SIC	CL, CH	A-6, A-7
	58-72	VFSL	SC, ML, CL	A-4
EvA-------------- Evesboro	0-6	LS	SM, SC-SM	A-1, A-2, A-3
	6-72	SR S SL	SM, SC-SM	A-2, A-3, A-1
EvB-------------- Evesboro	0-10	LS	SM, SC-SM	A-1, A-2, A-3
	10-72	SR S SL	SM, SC-SM	A-2, A-3, A-1
EvC-------------- Evesboro	0-8	LS	SM, SC-SM	A-1, A-2, A-3
	8-72	SR S SL	SM, SC-SM	A-2, A-3, A-1
Fa--------------- Fallsington	0-15	SL	SM, CL-ML, ML, SC-SM	A-2, A-4
	15-30	SL L SCL	SM, SC, CL, ML	A-2, A-4, A-6
	30-72	SR S SCL	SM, SP-SM, CL, CL-ML	A-2, A-3, A-4
FmA-------------- Fott Mott	0-22	LS	SM, SP-SM	A-2
	22-47	SL SCL COSL	SM, SC, SC-SM	A-2, A-4, A-6
	47-72	SR GR-SL	SM, SC-SM, SP-SM	A-1, A-2, A-3
FmB-------------- Fott Mott	0-23	LS	SM, SP-SM	A-2
	23-40	SL SCL COSL	SM, SC, SC-SM	A-2, A-4, A-6
	40-72	SR GR-SL	SM, SC-SM, SP-SM	A-1, A-2, A-3
GaA-------------- Galestown	0-16	LS	SP-SM, SM	A-1, A-2, A-3
	16-38	LS S LFS	SM, SP-SM	A-1, A-2, A-3
	38-72	S LS GR-S	SP, SP-SM	A-1, A-3, A-2
GaB-------------- Galestown	0-29	LS	SP-SM, SM	A-1, A-2, A-3
	29-52	LS S LFS	SM, SP-SM	A-1, A-2, A-3
	52-72	S LS GR-S	SP, SP-SM	A-1, A-3, A-2

Table 18.—Engineering Index Properties, Part I--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO
	In			
GaC-------------- Galestown	0-22	LS	SP-SM, SM	A-1, A-2, A-3
	22-41	LS S LFS	SM, SP-SM	A-1, A-2, A-3
	41-72	S LS GR-S	SP, SP-SM	A-1, A-3, A-2
HbA-------------- Hambrook	0-6	SL	SM, ML, CL-ML	A-2, A-4
	6-10	L SL	SM, ML, CL-ML	A-2, A-4
	10-49	SCL SL L	SC-SM, CL, CL-ML	A-2, A-4, A-6
	49-72	SR FSL SICL	SC-SM, CL, CL-ML	A-4, A-6
HbB-------------- Hambrook	0-6	SL	SM, ML, CL-ML	A-2, A-4
	6-10	L SL	SM, ML, CL-ML	A-2, A-4
	10-49	SCL SL L	SC-SM, CL, CL-ML	A-2, A-4, A-6
	49-72	SR FSL SICL	SC-SM, CL, CL-ML	A-4, A-6
HmA-------------- Hammonton	0-15	LS	SM, SP-SM	A-2, A-1
	15-25	SL GR-SL	SC, SC-SM	A-2, A-1, A-4
	25-72	SR GRV-S SCL	SM, SP-SM, SC-SM, GM	A-2, A-1, A-4, A-3
HmB-------------- Hammonton	0-15	LS	SM, SP-SM	A-2, A-1
	15-30	SL GR-SL	SC, SC-SM	A-2, A-1, A-4
	30-72	SR GRV-S SCL	SM, SP-SM, SC-SM, GM	A-2, A-1, A-4, A-3
Hu--------------- Hurlock	0-15	LS	SM, SP-SM	A-2, A-1
	15-30	S LS	SM, SP-SM	A-2, A-1
	30-72	SR VFSL SICL	SC, ML, CL, CL-ML	A-4, A-6
In--------------- Indiantown	0-25	SIL	CL, CL-ML	A-4, A-6
	25-41	L SL LS	SM, SC-SM	A-4, A-2-4
	41-72	LS S	SM, SP-SM	A-3, A-2-4
Ke--------------- Kentuck	0-10	SIL	CL, CL-ML	A-4, A-8
	10-16	SIL	CL, CL-ML	A-4, A-6
	16-36	SIL SICL	CL	A-6, A-7
	36-72	FS LS S	SM, SP-SM	A-2, A-1, A-3
KsA-------------- Klej	0-3	LS	SM, SP-SM	A-2
	3-38	S FS	SP-SM, SM	A-1, A-2, A-3
	38-72	SL SCL	SM, SC, ML, CL	A-2, A-4, A-6
KsB-------------- Klej	0-8	LS	SM, SP-SM	A-2
	8-24	LS LFS	SM, SP-SM	A-2
	24-72	S FS	SP-SM, SM	A-1, A-2, A-3
Ma--------------- Manahawkin	0-42	Peat	PT	A-8
	42-72	S GR-S	SW, GP-GM, SP-SM, GW	A-1
MC:				
Mannington------	0-6	SIL	ML, CL-ML	A-4
	6-40	SIL SICL MK-SIL	CL	A-4, A-6
	40-80	Muck MPT	PT	A-8
Nanticoke-------	0-6	SIL	OL, ML, CL-ML	A-4
	6-40	SIL	ML, CL-ML, CL	A-4
	40-72	SICL	CL, CL-ML	A-4, A-6
MeA-------------- Matapeake	0-7	FSL	SM, SC-SM	A-4, A-2
	7-30	SIL SICL L	CL, ML	A-6
	30-72	SL LS S	SM, SP-SM	A-2, A-4, A-3
MeB-------------- Matapeake	0- 7	FSL	SM, SC-SM	A-4, A-2
	7-30	SIL SICL L	CL, ML	A-6
	30-72	SL LS S	SM, SP-SM	A-2, A-4, A-3

Table 18.--Engineering Index Properties, Part I--Continued

Map symbol and soil name	Depth	USDA texture	Classification	
			Unified	AASHTO
	In			
MkA---------------	0-10	SIL	ML, CL-ML, CL	A-4
Matapeake	10-32	SIL SICL L	CL, ML	A-6
	32-72	SL LS S	SM, SP-SM	A-2, A-4, A-3
MkB---------------	0-10	SIL	ML, CL-ML, CL	A-4
Matapeake	10-32	SIL SICL L	CL, ML	A-6
	32-72	SL LS S	SM, SP-SM	A-2, A-4, A-3
MpA---------------	0-8	FSL	SM, SC-SM, ML	A-4, A-2
Mattapex	8-35	SICL SIL	CL, CL-ML	A-4, A-6, A-7
	35-48	FSL L LS	SM, SC, CL, ML	A-2, A-4, A-6
	48-72	S LS	SM, SP-SM	A-2
MpB---------------	0-8	FSL	SM, SC-SM, ML	A-4, A-2
Mattapex	8-35	SICL SIL	CL, CL-ML	A-4, A-6, A-7
	35-40	FSL L LS	SM, SC, CL, ML	A-2, A-4, A-6
	40-72	S LS	SM, SP-SM	A-2
MqA---------------	0-12	SIL	CL-ML, CL	A-4
Mattapex	12-35	SICL SIL	CL, CL-ML	A-4, A-6, A-7
	35-40	FSL L LS	SM, SC, CL, ML	A-2, A-4, A-6
	40-72	S LS	SM, SP-SM	A-2
MqB---------------	0-12	SIL	CL-ML, CL	A-4
Mattapex	12-35	SICL SIL	CL, CL-ML	A-4, A-6, A-7
	35-40	FSL L LS	SM, SC, CL, ML	A-2, A-4, A-6
	40-72	S LS	SM, SP-SM	A-2
Mu:				
Mullica---------	0-14	LS	SM, SP-SM	A-2, A-1
	14-72	SR GR-S SCL	SM, SP-SM, SC	A-2-4, A-3, A-1-b, A-6
Berryland-------	0-17	LS	SP, SP-SM	A-3
	17-24	S	SP, SP-SM	A-3
	24-44	S LS	SP, SM, SC-SM, SP-SM	A-1, A-2, A-3
	44-72	SR S SL	SP, SM, SC-SM, SP-SM	A-1, A-2, A-3, A-4
NnA---------------	0-8	FSL	CL-ML, SC-SM	A-4
Nassawango	8-27	SICL SIL	CL	A-7, A-6
	27-34	SIL L	ML, CL-ML	A-4
	34-72	LS S	SP-SM	A-2, A-3, A-4
NnB---------------	0-8	FSL	CL-ML, SC-SM	A-4
Nassawango	8-27	SICL SIL	CL	A-7, A-6
	27-34	SIL L	ML, CL-ML	A-4
	34-72	LS S	SP-SM	A-2, A-3, A-4
NsA---------------	0-10	SIL	CL-ML, SC-SM	A-4
Nassawango	10-14	SIL	ML, CL-ML	A-4
	14-30	SICL SIL	CL	A-7, A-6
	30-36	SIL L	ML, CL-ML	A-4
	36-60	LS S	SP-SM	A-2, A-3, A-4
	60-72	FSL SL SIL	SM, ML, CL-ML	A-4
NsB---------------	0-14	SIL	CL-ML, SC-SM	A-4
Nassawango	14-30	SICL SIL	CL	A-7, A-6
	30-36	SIL L	ML, CL-ML	A-4
	36-43	LS S	SP-SM	A-2, A-3, A-4
	43-72	FSL SL SIL	SM, ML, CL-ML	A-4

Table 18.--Engineering Index Properties, Part I--Continued

Map symbol and soil name	Depth	USDA texture	Classification	
			Unified	AASHTO
	In			
Ot----------------	0-12	SIL	ML, CL-ML, SM, CL	A-4, A-6
Othello	12-28	SICL SIL	CL	A-6
	28-33	SL L SCL	SM, CL, SC, CL-ML	A-4, A-6
	33-72	S LS LFS	SM, SP-SM	A-1, A-2
Pk----------------	0-40	MPT	PT	A-8
Puckum	40-80	Muck MPT	PT	A-8
Pu----------------	0-13	Peat	PT	A-8
Purnell	13-18	S LS	SP-SM, SM	A-3, A-2-4
	18-72	S LS COS	SP, SM	A-1, A-2-4, A-3
RoA---------------	0-22	LS	SM, SP-SM	A-1, A-2
Rosedale	22-38	L	ML, CL, CL-ML	A-4
	38-72	SR COS SICL	SM, SC, ML, CL	A-1, A-2, A-4, A-6
RoB---------------	0-23	LS	SM, SP-SM	A-1, A-2
Rosedale	23-40	L	ML, CL, CL-ML	A-4
	40-48	SL FSL SCL	SM, SC, SC-SM	A-2, A-4
	48-72	SR COS SICL	SM, SC, ML, CL	A-1, A-2, A-4, A-6
RuA---------------	0-18	LS	SP-SM, SM	A-2, A-3
Runclint	18-32	S LS	SP-SM, SM	A-2, A-3
	32-66	S LS GR-S	SP-SM, SP	A-1, A-2, A-3
	66-72	SR S SCL	SP-SM, SC-SM, CL-ML	A-2, A-3, A-4
RuB---------------	0-8	LS	SP-SM, SM	A-2, A-3
Runclint	8-50	S LS	SP-SM, SM	A-2, A-3
	50-60	S LS GR-S	SP-SM, SP	A-1, A-2, A-3
	60-72	SR S SCL	SP-SM, SC-SM, CL-ML	A-2, A-3, A-4
SaA---------------	0-15	SL	SM, SC, SC-SM	A-2, A-4
Sassafras	15-37	L SCL SL	SC-SM, CL, SC, CL-ML	A-2, A-4, A-6
	37-72	SR S GR-SL	SP-SM, SC, SM, SC-SM	A-1, A-2, A-4, A-3
SaB---------------	0-15	SL	SM, SC, SC-SM	A-2, A-4
Sassafras	15-37	L SCL SL	SC-SM, CL, SC, CL-ML	A-2, A-4, A-6
	37-72	SR S GR-SL	SP-SM, SC, SM, SC-SM	A-1, A-2, A-4, A-3
SaC---------------	0-15	SL	SM, SC, SC-SM	A-2, A-4
Sassafras	15-37	L SCL SL	SC-SM, CL, SC, CL-ML	A-2, A-4, A-6
	37-72	SR S GR-SL	SP-SM, SC, SM, SC-SM	A-1, A-2, A-4, A-3
Su----------------	0-6	MK-SIL	OL, ML	A-8, A-4
Sunken	6-18	SIL	CL, CL-ML	A-4, A-6
	18-38	SICL SIL	CL	A-6
	38-65	VFSL FSL	SM, CL-ML, ML	A-4
	65-72	FS LFS LS	SM, SP-SM	A-3, A-2, A-4
Tk----------------	0-6	MPT	PT	A-8
Transquaking	6-48	MPT Muck	PT	A-8
	48-66	Muck MPT	PT	A-8
	66-80	SIC SICL	CL, CH	A-6, A-7
TP:				
Transquaking----	0-6	Peat	PT	A-8
	6-48	MPT Muck	PT	A-8
	48-66	Muck MPT	PT	A-8
	66-80	SIC SICL	CL, CH	A-6, A-7
Mispillion------	0-40	Peat	PT	A-8
	40-80	L SICL SIL	CL, CL-ML	A-4, A-6

Table 18.--Engineering Index Properties, Part I--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO
	In			
Uc:				
Urban land.				
Acquango--------	0-3	S	SP, SP-SM	A-1, A-3
	3-20	S COS FS	SP, SP-SM	A-1, A-3
	20-26	S COS FS	SP, SP-SM	A-1, A-3
	26-72	S COS FS	SP, SP-SM	A-1, A-3
Um:				
Urban land.				
Askecksy--------	0-10	LS	SP-SM	A-2, A-3
	10-34	S LS LFS	SP-SM, SM	A-2, A-3
	34-72	COS S FS	SP, SP-SM	A-1, A-3, A-2-4
Un:				
Urban land.				
Brockatonorton--	0-3	S	SP, SP-SM	A-1, A-3
	3-24	S FS COS	SP, SP-SM	A-1, A-3
	24-50	S FS COS	SP, SP-SM	A-1, A-3
	50-60	MPT Muck	PT	A-8
	60-72	S LS	SP, SP-SM	A-1, A-3
Ur.				
Urban land				
Ut:				
Urban land.				
Udorthents------	0-8	LS	SP, SM, SP-SM	A-1, A-2, A-3
	8-12	GRV-SL GRV-LS GRV-S	GW, GP, GC, SP	A-1, A-2-4, A-2-6
	12-72	SR S L	SM, ML, SP-SM	A-2, A-4, A-3, A-6
Uz---------------	0-8	LS	SP, SM, SP-SM	A-1, A-2, A-3
Udorthents	8-12	GRV-SL GRV-LS GRV-S	GW, GP, GC, SP	A-1, A-2-4, A-2-6
	12-72	SR S L	SM, ML, SP-SM	A-2, A-4, A-3, A-6
WdA--------------	0-10	SL	SM, CL-ML, SC-SM	A-2, A-4
Woodstown	10-37	SCL L SL	SM, CL-ML, CL, SC-SM	A-2, A-4, A-6
	37-72	SR GR-S SL	SM, SP-SM, SC-SM	A-1, A-2, A-3, A-2-4
WdB--------------	0-10	SL	SM, CL-ML, SC-SM	A-2, A-4
Woodstown	10-37	SCL L SL	SM, CL-ML, CL, SC-SM	A-2, A-4, A-6
	37-72	SR GR-S SL	SM, SP-SM, SC-SM	A-1, A-2, A-3, A-2-4
Zk---------------	0-3	SIL	ML, CL-ML	A-4
Zekiah	3-20	SIL L	ML, CL-ML	A-4
	20-27	MK-L L SL	ML, SM	A-4, A-2-4
	27-37	MK-SL SL LS	SM	A-2-4
	37-50	L SL SIL	SM	A-4, A-2-4
	50-72	S LS COS	SM, SP-SM	A-3, A-2-4, A-1

Table 18.—Engineering Index Properties, Part II

(Absence of an entry indicates that the data were not estimated)

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
AcB--------------------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
Acquango	3-20	0	95-100	85-100	40-90	0-10	0-14	0
	20-26	0	95-100	85-100	40-90	0-10	0-14	0
	26-72	0	95-100	85-100	40-90	0-10	0-14	0
AcC--------------------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
Acquango	3-20	0	95-100	85-100	40-90	0-10	0-14	0
	20-26	0	95-100	85-100	40-90	0-10	0-14	0
	26-72	0	95-100	85-100	40-90	0-10	0-14	0
As---------------------	0-10	0	100	98-100	60-85	5-20	0-14	0
Askecksy	10-34	0	98-100	98-100	65-97	5-20	0-14	0
	34-72	0	98-100	90-100	40-60	2-10	0-14	0
Be---------------------	0-6	0	100	75-100	5-85	0-5	0-14	0
Beaches	6-60	0	100	75-100	5-85	0-5	0-14	0
Bh---------------------	0-12	0	95-100	90-100	55-90	2-10	0-14	0
Berryland	12-20	0	95-100	90-100	55-90	2-10	0-14	0
	20-30	0	95-100	90-100	55-90	2-10	0-14	0
	30-40	0	95-100	80-100	40-90	2-35	0-25	0-8
	40-72	0	95-100	80-100	40-90	2-50	---	---
BkA--------------------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
Brockatonorton	3-24	0	95-100	85-100	40-90	0-10	0-14	0
	24-50	0	95-100	85-100	40-90	0-10	0-14	0
	50-60	0	---	---	---	---	0-14	0
	60-72	0	95-100	85-100	40-90	0-10	0-14	0
BkB--------------------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
Brockatonorton	3-24	0	95-100	85-100	40-90	0-10	0-14	0
	24-50	0	95-100	85-100	40-90	0-10	0-14	0
	50-60	0	---	---	---	---	0-14	0
	60-72	0	95-100	85-100	40-90	0-10	0-14	0
Br---------------------	0-6	0	100	100	90-100	75-90	25-35	5-10
Broadkill	6-38	0	100	100	75-100	75-92	25-50	15-30
	38-72	0	100	75-100	70-95	10-85	0-40	0-25
BX:								
Boxiron---------------	0-14	0	---	---	---	---	---	0
	14-30	0	100	100	70-100	70-90	25-50	15-35
	30-74	0	100	100	70-100	70-90	20-40	10-25
	74-80	0	100	75-100	50-80	5-40	---	0
Broadkill-------------	0-6	0	100	100	90-100	75-90	25-35	5-10
	6-38	0	100	100	75-100	75-92	25-50	15-30
	38-72	0	100	75-100	70-95	10-85	0-40	0-25
CeA:								
Cedartown-------------	0-6	0	95-100	85-100	40-90	5-25	0-14	0
	6-14	0	95-100	85-100	40-90	5-25	0-14	0
	14-30	0	95-100	95-100	50-90	10-25	0-14	0
	30-42	0	95-100	85-100	40-90	5-25	0-14	0
	42-64	0	95-100	85-100	40-90	5-25	0-14	0
	64-72	0	85-100	70-100	70-90	40-85	15-25	5-10

Table 18.--Engineering Index Properties, Part II--Continued

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
CeA:								
Rosedale--------------	0-22	0	100	95-100	45-80	10-25	0-20	0-3
	22-38	0	85-100	80-100	70-95	50-75	12-32	0-10
	38-72	0	100	95-100	35-98	15-65	0-40	0-20
CeB:								
Cedartown-------------	0-6	0	95-100	85-100	40-90	5-25	0-14	0
	6-14	0	95-100	85-100	40-90	5-25	0-14	0
	14-30	0	95-100	95-100	50-90	10-25	0-14	0
	30-42	0	95-100	85-100	40-90	5-25	0-14	0
	42-64	0	95-100	85-100	40-90	5-25	0-14	0
	64-72	0	85-100	70-100	70-90	40-85	15-25	5-10
Rosedale--------------	0-22	0	100	95-100	45-80	10-25	0-20	0-3
	22-38	0	85-100	80-100	70-95	50-75	12-32	0-10
	38-72	0	100	95-100	35-98	15-65	0-40	0-20
Ch---------------------	0-10	0	100	100	80-95	70-90	15-25	0-10
Chicone	10-18	0	100	100	80-95	70-90	15-25	0-10
	18-30	0	---	---	---	---	0-14	0
	30-72	0	80-100	70-100	20-70	5-30	0-20	0-5
Ek---------------------	0-15	0	100	95-100	70-100	35-50	15-30	0-10
Elkton	15-36	0	100	100	90-100	85-95	25-40	10-20
	36-72	0	100	95-100	85-95	45-75	20-30	0-10
Em---------------------	0-20	0	100	100	90-100	50-95	25-45	5-15
Elkton	20-47	0	100	100	90-100	85-95	25-40	10-20
	47-58	0	100	100	95-100	85-95	30-55	10-35
	58-72	0	100	95-100	85-95	45-75	20-30	0-10
EvA--------------------	0-6	0	90-100	85-100	40-80	15-30	15-20	0-5
Evesboro	6-72	0	75-100	65-100	35-90	5-35	10-15	0-5
EvB--------------------	0-10	0	90-100	85-100	40-80	15-30	15-20	0-5
Evesboro	10-72	0	75-100	65-100	35-90	5-35	10-15	0-5
EvC--------------------	0-8	0	90-100	85-100	40-80	15-30	15-20	0-5
Evesboro	8-72	0	75-100	65-100	35-90	5-35	10-15	0-5
Fa---------------------	0-15	0	95-100	90-100	65-90	30-60	0-19	0-5
Fallsington	15-30	0	95-100	90-100	65-85	30-55	0-30	0-15
	30-72	0	95-100	90-100	50-85	5-55	0-30	0-15
FmA--------------------	0-22	0	90-100	85-100	50-90	10-25	15-20	0-3
Fort Mott	22-47	0	90-100	80-100	50-90	25-45	20-35	3-12
	47-72	0	80-100	75-100	40-80	5-35	15-25	0-6
FmB--------------------	0-23	0	90-100	85-100	50-90	10-25	15-20	0-3
Fort Mott	23-40	0	90-100	80-100	50-90	25-45	20-35	3-12
	40-72	0	80-100	75-100	40-80	5-35	15-25	0-6
GaA--------------------	0-16	0	95-100	75-100	45-70	4-20	0-14	0
Galestown	16-38	0	95-100	95-100	45-75	4-20	0-14	0
	38-72	0	75-100	55-100	30-75	4-10	0-14	0
GaB--------------------	0-29	0	95-100	75-100	45-70	4-20	0-14	0
Galestown	29-52	0	95-100	95-100	45-75	4-20	0-14	0
	52-72	0	75-100	55-100	30-75	4-10	0-14	0

Table 18.--Engineering Index Properties, Part II--Continued

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
GaC-------------------	0-22	0	95-100	75-100	45-70	4-20	0-14	0
Galestown	22-41	0	95-100	95-100	45-75	4-20	0-14	0
	41-72	0	75-100	55-100	30-75	4-10	0-14	0
HbA-------------------	0-6	0	90-100	85-100	50-95	25-60	15-35	0-10
Hambrook	6-10	0	90-100	85-100	40-90	20-60	10-30	0-10
	10-49	0	90-100	85-100	50-95	30-75	20-30	5-15
	49-72	0	85-100	70-100	70-90	40-85	15-25	5-15
HbB-------------------	0-6	0	90-100	85-100	50-95	25-60	15-35	0-10
Hambrook	6-10	0	90-100	85-100	40-90	20-60	10-30	0-10
	10-49	0	90-100	85-100	50-95	30-75	20-30	5-15
	49-72	0	85-100	70-100	70-90	40-85	15-25	5-15
HmA-------------------	0-15	0	90-100	85-100	40-75	10-30	10-15	0-3
Hammonton	15-25	0	80-100	70-100	40-90	20-40	20-25	4-8
	25-72	0	60-100	45-100	20-80	5-50	10-30	0-10
HmB-------------------	0-15	0	90-100	85-100	40-75	10-30	10-15	0-3
Hammonton	15-30	0	80-100	70-100	40-90	20-40	20-25	4-8
	30-72	0	60-100	45-100	20-80	5-50	10-30	0-10
Hu--------------------	0-15	0	100	90-100	40-90	10-35	0-15	0-5
Hurlock	15-30	0	80-100	75-100	20-70	5-30	0-20	0-5
	30-72	0	90-100	75-95	70-90	40-80	10-30	0-15
In--------------------	0-25	0	100	100	90-100	75-90	25-40	5-15
Indiantown	25-41	0	100	100	40-80	25-50	5-15	0-5
	41-72	0	100	100	20-70	5-30	---	0
Ke--------------------	0-10	0	100	100	90-100	75-90	25-40	5-15
Kentuck	10-16	0	100	100	90-100	75-90	25-40	5-15
	16-36	0	100	100	90-100	75-95	35-45	15-20
	36-72	0	100	100	40-80	5-35	0-20	0-5
KsA-------------------	0-3	0	100	95-100	50-95	10-25	0-20	0
Klej	3-38	0	90-100	75-100	40-80	5-20	0-20	0
	38-72	0	90-100	75-100	45-95	20-60	10-30	0-15
KsB-------------------	0-8	0	100	95-100	50-95	10-25	0-20	0
Klej	8-24	0	100	95-100	50-95	10-25	0-20	0
	24-72	0	90-100	75-100	40-80	5-20	0-20	0
Ma--------------------	0-42	---	---	---	---	---	0-14	---
Manahawkin	42-72	0	40-100	35-100	20-50	4-10	15-20	0-3
MC:								
Mannington------------	0-6	0	100	100	80-95	70-90	15-20	3-7
	6-40	0	100	100	80-95	70-90	30-40	8-15
	40-80	0	---	---	---	---	0-14	0
Nanticoke------------	0-6	0	100	100	80-95	70-90	15-25	0-10
	6-40	0	100	100	80-95	70-90	15-25	0-10
	40-72	0	100	100	80-95	70-90	15-30	5-15
MeA-------------------	0-7	0	100	100	80-100	30-65	15-30	2-9
Matapeake	7-30	0	100	100	80-100	85-100	27-45	10-22
	30-72	0	95-100	90-100	55-70	5-40	0-19	0-3

Table 18.—Engineering Index Properties, Part II--Continued

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
MeB--------------------Matapeake	0-7	0	100	100	80-100	30-65	15-30	2-9
	7-30	0	100	100	80-100	85-100	27-45	10-22
	30-72	0	95-100	90-100	55-70	5-40	0-19	0-3
MkA--------------------Matapeake	0-10	0	100	100	80-100	80-100	20-33	3-9
	10-32	0	100	100	80-100	85-100	27-45	10-22
	32-72	0	95-100	90-100	55-70	5-40	0-19	0-3
MkB--------------------Matapeake	0-10	0	100	100	80-100	80-100	20-33	3-9
	10-32	0	100	100	80-100	85-100	27-45	10-22
	32-72	0	95-100	90-100	55-70	5-40	0-19	0-3
MpA--------------------Mattapex	0-8	0	95-100	90-100	80-100	30-65	15-30	0-10
	8-35	0	100	100	90-100	85-95	24-45	7-21
	35-48	0	95-100	90-100	45-95	15-75	0-40	0-18
	48-72	0	95-100	90-100	43-85	5-30	0-10	0
MpB--------------------Mattapex	0-8	0	95-100	90-100	80-100	30-65	15-30	0-10
	8-35	0	100	100	90-100	85-95	24-45	7-21
	35-40	0	95-100	90-100	45-95	15-75	0-40	0-18
	40-72	0	95-100	90-100	43-85	5-30	0-10	0
MqA--------------------Mattapex	0-12	0	95-100	90-100	80-100	80-100	15-30	5-15
	12-35	0	100	100	90-100	85-95	24-45	7-21
	35-40	0	95-100	90-100	45-95	15-75	0-40	0-18
	40-72	0	95-100	90-100	43-85	5-30	0-10	0
MqB--------------------Mattapex	0-12	0	95-100	90-100	80-100	80-100	15-30	5-15
	12-35	0	100	100	90-100	85-95	24-45	7-21
	35-40	0	95-100	90-100	45-95	15-75	0-40	0-18
	40-72	0	95-100	90-100	43-85	5-30	0-10	0
Mu:								
Mullica----------------	0-14	0	90-100	85-100	40-75	10-30	10-15	0-3
	14-72	0	70-100	55-100	35-85	5-50	15-30	0-13
Berryland-------------	0-17	0	95-100	90-100	55-90	2-10	0-14	0
	17-24	0	95-100	90-100	55-90	2-10	0-14	0
	24-44	0	95-100	80-100	40-90	2-35	0-25	0-8
	44-72	0	95-100	80-100	40-90	2-50	---	---
NnA--------------------Nassawango	0-8	0	85-100	70-100	70-90	40-85	20-33	3-9
	8-27	0	100	100	80-100	80-100	27-45	10-22
	27-34	0	100	100	80-100	80-100	20-33	3-9
	34-72	0	95-100	90-100	55-70	5-40	0-15	0
NnB--------------------Nassawango	0-8	0	85-100	70-100	70-90	40-85	20-33	3-9
	8-27	0	100	100	80-100	80-100	27-45	10-22
	27-34	0	100	100	80-100	80-100	20-33	3-9
	34-72	0	95-100	90-100	55-70	5-40	0-15	0
NsA--------------------Nassawango	0-10	0	85-100	70-100	70-90	40-85	20-33	3-9
	10-14	0	100	100	80-100	80-100	20-33	3-9
	14-30	0	100	100	80-100	80-100	27-45	10-22
	30-36	0	100	100	80-100	80-100	20-33	3-9
	36-60	0	95-100	90-100	55-70	5-40	0-15	0
	60-72	0	85-100	70-95	50-90	40-85	15-30	2-9

Table 18.—Engineering Index Properties, Part II--Continued

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
NsB--------------------	0-14	0	85-100	70-100	70-90	40-85	20-33	3-9
Nassawango	14-30	0	100	100	80-100	80-100	27-45	10-22
	30-36	0	100	100	80-100	80-100	20-33	3-9
	36-43	0	95-100	90-100	55-70	5-40	0-15	0
	43-72	0	85-100	70-95	50-90	40-85	15-30	2-9
Ot---------------------	0-12	0	100	100	70-100	40-95	20-35	0-15
Othello	12-28	0	100	100	90-100	70-95	29-40	10-19
	28-33	0	90-100	85-100	50-90	25-65	15-35	0-17
	33-72	0	90-100	85-100	20-50	5-35	0-10	0-5
Pk---------------------	0-40	0	---	---	---	---	---	---
Puckum	40-80	0	---	---	---	---	---	---
Pu---------------------	0-13	0	---	---	---	---	---	0
Purnell	13-18	0	95-100	85-100	50-80	5-40	---	0
	18-72	0	95-100	85-100	35-70	0-25	---	0
RoA--------------------	0-22	0	100	95-100	45-80	10-25	0-20	0-3
Rosedale	22-38	0	85-100	80-100	70-95	50-75	12-32	0-10
	38-72	0	100	95-100	35-98	15-65	0-40	0-20
RoB--------------------	0-23	0	100	95-100	45-80	10-25	0-20	0-3
Rosedale	23-40	0	85-100	80-100	70-95	50-75	12-32	0-10
	40-48	0	100	95-100	50-85	15-25	0-30	0-10
	48-72	0	100	95-100	35-98	15-65	0-40	0-20
RuA--------------------	0-18	0	90-100	70-100	50-90	5-15	0-14	0
Runclint	18-32	0	90-100	70-100	50-90	5-15	0-14	0
	32-66	0	55-100	50-100	20-80	0-15	0-14	0
	66-72	0	80-100	50-100	50-90	5-55	0-30	0-10
RuB--------------------	0-8	0	90-100	70-100	50-90	5-15	0-14	0
Runclint	8-50	0	90-100	70-100	50-90	5-15	0-14	0
	50-60	0	55-100	50-100	20-80	0-15	0-14	0
	60-72	0	80-100	50-100	50-90	5-55	0-30	0-10
SaA--------------------	0-15	0	85-100	80-100	50-85	25-55	12-32	0-10
Sassafras	15-37	0	85-100	80-100	50-95	25-75	20-33	5-15
	37-72	0	70-100	50-100	30-90	5-55	0-26	0-8
SaB--------------------	0-15	0	85-100	80-100	50-85	25-55	12-32	0-10
Sassafras	15-37	0	85-100	80-100	50-95	25-75	20-33	5-15
	37-72	0	70-100	50-100	30-90	5-55	0-26	0-8
SaC--------------------	0-15	0	85-100	80-100	50-85	25-55	12-32	0-10
Sassafras	15-37	0	85-100	80-100	50-95	25-75	20-33	5-15
	37-72	0	70-100	50-100	30-90	5-55	0-26	0-8
Su---------------------	0-6	0	100	100	95-100	85-100	20-35	0-10
Sunken	6-18	0	100	100	95-100	85-100	20-30	5-15
	18-38	0	100	100	95-100	85-100	30-40	10-20
	38-65	0	100	100	80-100	40-90	15-35	0-10
	65-72	0	100	100	60-90	5-40	0-14	0
Tk---------------------	0-6	0	---	---	---	---	0-14	0
Transquaking	6-48	0	---	---	---	---	0-14	0
	48-66	0	---	---	---	---	0-14	0
	66-80	0	100	100	80-100	70-95	35-60	20-35

Table 18.—Engineering Index Properties, Part II--Continued

Map symbol and soil name	Depth	Fragments >3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In	Pct					Pct	
TP:								
Transquaking----------	0-6	0	---	---	---	---	0-14	0
	6-48	0	---	---	---	---	0-14	0
	48-66	0	---	---	---	---	0-14	0
	66-80	0	100	100	80-100	70-95	35-60	20-35
Mispillion------------	0-40	---	---	---	---	---	0	---
	40-80	0	100	100	80-95	70-90	15-30	5-15
Uc:								
Urban land.								
Acquango--------------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
	3-20	0	95-100	85-100	40-90	0-10	0-14	0
	20-26	0	95-100	85-100	40-90	0-10	0-14	0
	26-72	0	95-100	85-100	40-90	0-10	0-14	0
Um:								
Urban land.								
Askecksy--------------	0-10	0	100	98-100	60-85	5-20	0-14	0
	10-34	0	98-100	98-100	65-97	5-20	0-14	0
	34-72	0	98-100	90-100	40-60	2-10	0-14	0
Un:								
Urban land.								
Brockatonorton--------	0-3	0	95-100	85-100	40-90	0-10	0-14	0
	3-24	0	95-100	85-100	40-90	0-10	0-14	0
	24-50	0	95-100	85-100	40-90	0-10	0-14	0
	50-60	0	---	---	---	---	0-14	0
	60-72	0	95-100	85-100	40-90	0-10	0-14	0
Ur.								
Urban land								
Ut:								
Urban land.								
Udorthents------------	0-8	0	75-100	60-90	40-85	0-25	0-14	0
	8-12	5-15	40-60	30-55	15-40	0-20	20-38	5-15
	12-72	0	90-100	90-100	60-95	5-60	15-30	0-15
Uz--------------------	0-8	0	75-100	60-90	40-85	0-25	0-14	0
Udorthents	8-12	5-15	40-60	30-55	15-40	0-20	20-38	5-15
	12-72	0	90-100	90-100	60-95	5-60	15-30	0-15
WdA-------------------	0-10	0	90-100	80-100	60-95	30-75	0-28	0-7
Woodstown	10-37	0	90-100	70-100	45-90	25-60	0-32	0-20
	37-72	0	80-100	70-95	35-55	5-25	0-26	0-6
WdB-------------------	0-10	0	90-100	80-100	60-95	30-75	0-28	0-7
Woodstown	10-37	0	90-100	70-100	45-90	25-60	0-32	0-20
	37-72	0	80-100	70-95	35-55	5-25	0-26	0-6
Zk--------------------	0-3	0	100	100	70-100	45-100	15-25	0-10
Zekiah	3-20	0	100	100	70-100	45-100	15-25	0-10
	20-27	0	90-100	75-100	50-95	25-75	15-26	0-10
	27-37	0	90-100	75-100	50-70	25-45	15-26	0-10
	37-50	0	90-100	75-100	35-70	25-50	15-25	0-10
	50-72	0	90-100	75-100	35-70	5-25	---	0-5

Table 19.—Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wine erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
AcB------------	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	0.0-1.0
Acquango	3-20	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	20-26	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	26-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
AcC------------	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	0.0-1.0
Acquango	3-20	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	20-26	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	26-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
As-------------	0-10	1-10	1.40-1.60	6.00-20.00	0.03-0.10	3.8-6.0	0	Low	0.10	5	2	1.0-5.0
Askecksy	10-34	1-10	1.40-1.70	6.00-20.00	0.03-0.10	3.8-6.0	0	Low	0.10			0.5-1.0
	34-72	2-5	1.40-1.80	6.00-25.00	0.02-0.05	3.8-6.0	0	Low	0.05			0.5-1.0
Be-------------	0-6	0-1	1.35-1.85	6.00-20.00	0.03-0.05	5.1-7.8	4-32	Low	0.05	5	1	0.0-0.1
Beaches	6-60	0-1	1.35-1.85	6.00-20.00	0.03-0.05	5.1-7.8	4-32	Low	0.05			0.0-0.1
Bh-------------	0-12	1-5	1.30-1.45	6.00-20.00	0.06-0.08	3.6-4.4	0	Low	0.17	2	8	4.0-8.0
Berryland	12-20	2-7	1.40-1.55	2.00-6.00	0.08-0.12	4.5-5.0	0	Low	0.20			0.0-0.0
	20-30	3-10	1.50-1.60	2.00-6.00	0.04-0.08	4.5-5.0	0	Low	0.17			0.0-0.0
	30-40	3-10	1.50-1.60	2.00-20.00	0.04-0.14	4.5-5.0	0	Low	0.17			0.0-0.0
	40-72	3-10	1.50-1.60	2.00-20.00	0.04-0.14	4.5-5.0	0	Low	0.28			0.0-0.0
BkA------------	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	1.0-3.0
Brockatonorton	3-24	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	24-50	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	50-60	0	0.10-0.50	2.00-20.00	0.25-0.40	4.5-7.8	0-8	Low	0.02			30.0-80.0
	60-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
BkB------------	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	1.0-3.0
Brockatonorton	3-24	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	24-50	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	50-60	0	0.10-0.50	2.00-20.00	0.25-0.40	4.5-7.8	0-8	Low	0.02			30.0-80.0
	60-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
Br-------------	0-6	14-18	1.20-1.50	0.60-2.00	0.20-0.25	3.5-5.5	16-32	Low	0.02	1	8	5.0-15.0
Broadkill	6-38	25-35	1.40-1.70	0.20-2.00	0.10-0.20	5.6-7.3	16-32	Moderate	0.28			2.0-10.0
	38-72	5-30	1.30-1.70	0.20-20.00	0.10-0.35	5.6-7.3	16-32	Low	0.32			0.5-20.0
BX:												
Boxiron-------	0-14	---	0.10-0.60	2.00-20.00	0.30-0.60	6.6-7.8	8-16	Low	0.02	1	8	25.0-70.0
	14-30	20-35	1.40-1.50	0.20-2.00	0.10-0.20	6.6-7.8	8-16	Moderate	0.28			2.0-15.0
	30-74	20-35	1.30-1.50	0.20-2.00	0.10-0.20	6.6-7.8	8-16	Moderate	0.28			0.0-5.0
	74-80	2-10	1.45-1.70	20.00	0.02-0.13	6.6-7.8	8-16	Low	0.15			0.0-5.0
Broadkill-----	0-6	14-18	1.20-1.50	0.60-2.00	0.20-0.25	3.5-5.5	16-32	Low	0.24	1	8	5.0-15.0
	6-38	25-35	1.40-1.70	0.20-2.00	0.10-0.20	5.6-7.3	16-32	Moderate	0.28			2.0-10.0
	38-72	5-30	1.30-1.70	0.20-20.00	0.10-0.35	5.6-7.3	16-32	Low	0.32			0.5-20.0
CeA:												
Cedartown-----	0-6	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20	4	2	0.5-2.0
	6-14	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20			0.0-0.5
	14-30	6-10	1.30-1.65	6.00-20.00	0.08-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
	30-42	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20			0.0-0.5
	42-64	2-7	1.35-1.80	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.28			0.0-0.5
	64-72	10-20	1.10-1.45	0.60-6.00	0.10-0.13	3.6-5.5	0	Low	0.28			0.0-0.5

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
CeA:												
Rosedale------	0-22	3-10	1.52-1.71	6.00-20.00	0.04-0.10	3.8-5.5	0	Low	0.15	4	2	0.5-5.0
	22-38	7-12	1.00-1.45	0.60-2.00	0.12-0.20	3.5-5.5	0	Low	0.28	4	5	1.0-2.0
	38-72	0-30	1.30-1.75	0.20-20.00	0.02-0.15	3.8-5.5	0	Moderate	0.28			0.5-1.0
CeB:												
Cedartown-----	0-6	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20	4	2	0.5-2.0
	6-14	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20			0.0-0.5
	14-30	6-10	1.30-1.65	6.00-20.00	0.08-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
	30-42	2-7	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20			0.0-0.5
	42-64	2-7	1.35-1.80	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.28			0.0-0.5
	64-72	10-20	1.10-1.45	0.60-6.00	0.10-0.13	3.6-5.5	0	Low	0.28			0.0-0.5
Rosedale------	0-22	3-10	1.52-1.71	6.00-20.00	0.04-0.10	3.8-5.5	0	Low	0.15	4	2	0.5-5.0
	22-38	7-12	1.00-1.45	0.60-2.00	0.12-0.20	3.5-5.5	0	Low	0.28	4	5	1.0-2.0
	38-72	0-30	1.30-1.75	0.20-20.00	0.02-0.15	3.8-5.5	0	Moderate	0.28			0.5-1.0
Ch------------- Chicone	0-10	8-15	1.30-1.50	0.60-2.00	0.15-0.30	3.5-5.5	0	Low	0.28	2	8	10.0-20.0
	10-18	8-15	1.50-1.70	0.60-6.00	0.10-0.18	3.5-5.5	0	Low	0.37			0.5-3.0
	18-30	0	0.10-0.50	6.00-20.00	0.35-0.45	3.5-5.5	0	Low	0.05			60.0-80.0
	30-72	3-8	1.40-1.70	2.00-20.00	0.05-0.10	3.5-5.5	0	Low	0.15			0.5-1.0
Ek------------- Elkton	0-15	11-20	1.25-1.55	0.60-2.00	0.10-0.15	3.6-5.5	0	Low	0.24	4	3	1.0-4.0
	15-36	27-35	1.35-1.55	0.06-0.20	0.14-0.20	3.6-5.5	0	Moderate	0.37			0.0-0.5
	36-72	15-20	1.45-1.65	0.20-0.60	0.10-0.15	3.6-5.5	0	Low	0.32			0.0-0.5
Em------------- Elkton	0-20	11-25	1.20-1.50	0.60-2.00	0.18-0.24	3.6-5.5	0	Low	0.43	4	5	1.0-4.0
	20-47	27-35	1.35-1.55	0.06-0.20	0.14-0.20	3.6-5.5	0	Moderate	0.37			0.0-0.5
	47-58	27-45	1.35-1.55	0.00-0.20	0.12-0.19	3.6-5.5	0	Moderate	0.32			0.0-0.5
	58-72	15-20	1.45-1.65	0.20-0.60	0.10-0.15	3.6-5.5	0	Low	0.32			0.0-0.5
EvA------------ Evesboro	0-6	4-10	1.20-1.50	6.00-20.00	0.06-0.09	3.6-5.0	---	Low	0.20	4	2	1.0-2.0
	6-72	2-10	1.30-1.60	2.00-20.00	0.04-0.12	4.5-5.0	0	Low	0.17			0.0-0.5
EvB------------ Evesboro	0-10	4-10	1.20-1.50	6.00-20.00	0.06-0.09	3.6-5.0	---	Low	0.20	4	2	1.0-2.0
	10-72	2-10	1.30-1.60	2.00-20.00	0.04-0.12	4.5-5.0	0	Low	0.17			0.0-0.5
EvC------------ Evesboro	0-8	4-10	1.20-1.50	6.00-20.00	0.06-0.09	3.6-5.0	---	Low	0.20	3	2	1.0-2.0
	8-72	2-10	1.30-1.60	2.00-20.00	0.04-0.12	4.5-5.0	0	Low	0.17			0.0-0.5
Fa------------- Fallsington	0-15	5-18	1.00-1.45	0.60-6.00	0.15-0.20	3.6-5.5	0	Low	0.24	4	3	0.5-2.0
	15-30	18-30	1.50-1.80	0.20-2.00	0.15-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
	30-72	2-30	1.50-1.85	0.60-20.00	0.06-0.20	3.6-5.5	0	Low	0.20			0.0-0.5
FmA------------ Fort Mott	0-22	5-10	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20	4	2	0.5-2.0
	22-47	10-30	1.25-1.80	0.60-6.00	0.12-0.16	3.6-5.5	0	Low	0.32			0.0-0.5
	47-72	5-15	1.30-1.80	6.00-20.00	0.03-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
FmB------------ Fort Mott	0-23	5-10	1.25-1.60	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.20	4	2	0.5-2.0
	23-40	10-30	1.25-1.80	0.60-6.00	0.12-0.16	3.6-5.5	0	Low	0.32			0.0-0.5
	40-72	5-15	1.30-1.80	6.00-20.00	0.03-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
GaA------------ Galestown	0-16	4-10	1.50-1.70	6.00-20.00	0.06-0.08	3.6-5.5	0	Low	0.17	5	2	0.5-2.0
	16-38	4-10	1.50-1.70	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
	38-72	2-6	1.50-1.65	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
GaB------------ Galestown	0-29	4-10	1.50-1.70	6.00-20.00	0.06-0.08	3.6-5.5	0	Low	0.17	5	2	0.5-2.0
	29-52	4-10	1.50-1.70	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
	52-72	2-6	1.50-1.65	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wine erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
GaC------------ Galestown	0-22	4-10	1.50-1.70	6.00-20.00	0.06-0.08	3.6-5.5	0	Low	0.17	3	2	0.5-2.0
	22-41	4-10	1.50-1.70	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
	41-72	2-6	1.50-1.65	6.00-20.00	0.04-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
HbA------------ Hambrook	0-6	12-18	1.30-1.60	0.60-6.00	0.12-0.20	3.6-5.5	---	Low	0.28	4	5	0.5-3.0
	6-10	10-18	1.45-1.65	0.60-6.00	0.10-0.16	3.6-5.5	---	Low	0.24			0.0-0.5
	10-49	18-27	1.35-1.70	0.60-2.00	0.14-0.22	3.6-5.5	---	Low	0.37			0.0-0.5
	49-72	15-30	1.50-1.70	0.06-0.60	0.12-0.24	3.6-5.5	---	Low	0.49			0.0-0.5
HbB------------ Hambrook	0-6	12-18	1.30-1.60	0.60-6.00	0.12-0.20	3.6-5.5	---	Low	0.28	4	5	0.5-3.0
	6-10	10-18	1.45-1.65	0.60-6.00	0.10-0.16	3.6-5.5	---	Low	0.24			0.0-0.5
	10-49	18-27	1.35-1.70	0.60-2.00	0.14-0.22	3.6-5.5	---	Low	0.37			0.0-0.5
	49-72	15-30	1.50-1.70	0.06-0.60	0.12-0.24	3.6-5.5	---	Low	0.49			0.0-0.5
HmA------------ Hammonton	0-15	2-7	1.20-1.60	6.00-20.00	0.06-0.10	3.5-5.5	0	Low	0.20	4	2	0.5-2.0
	15-25	10-18	1.45-1.65	2.00-6.00	0.08-0.13	4.5-5.5	0	Low	0.32			0.0-0.5
	25-72	2-22	1.40-1.75	0.60-20.00	0.03-0.15	4.5-5.5	0	Low	0.17			0.0-0.5
HmB------------ Hammonton	0-15	2-7	1.20-1.60	6.00-20.00	0.06-0.10	3.5-5.5	0	Low	0.20	4	2	0.5-2.0
	15-30	10-18	1.45-1.65	2.00-6.00	0.08-0.13	4.5-5.5	0	Low	0.32			0.0-0.5
	30-72	2-22	1.40-1.75	0.60-20.00	0.03-0.15	4.5-5.5	0	Low	0.17			0.0-0.5
Hu------------- Hurlock	0-15	3-8	1.30-1.70	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.15	5	2	0.5-3.0
	15-30	3-8	1.40-1.70	2.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.15			0.0-0.5
	30-72	15-30	1.50-1.70	0.06-0.60	0.12-0.24	3.6-5.5	0	Low	0.55			0.0-0.5
In------------- Indiantown	0-25	14-20	1.40-1.70	0.60-2.00	0.15-0.21	3.5-5.5	0-2	Low	0.43	1	5	0.5-1.0
	25-41	5-15	1.40-1.65	2.00-6.00	0.02-0.08	3.5-5.5	0-2	Low	0.32			1.0-10.0
	41-72	3-8	1.40-1.70	6.00-20.00	0.04-0.09	3.5-5.5	0-2	Low	0.17			0.0-1.0
Ke------------- Kentuck	0-10	14-20	1.20-1.70	0.60-2.00	0.20-0.21	3.5-5.5	0	Low	0.43	5	5	0.5-1.0
	10-16	14-20	1.40-1.70	0.60-2.00	0.15-0.21	3.5-5.5	0	Low	0.43			0.5-1.0
	16-36	24-34	1.40-1.70	0.06-0.60	0.15-0.21	3.5-5.5	0	Low	0.43			0.0-0.5
	36-72	3-8	1.65-1.80	6.00-20.00	0.05-0.11	3.5-5.5	0	Low	0.15			0.0-0.5
KsA------------ Klej	0-3	2-10	1.30-1.60	6.00-20.00	0.06-0.11	3.6-5.5	0	Low	0.17	5	2	1.0-3.0
	3-38	2-10	1.50-1.75	6.00-20.00	0.06-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
	38-72	10-27	1.40-1.55	0.00-2.00	0.11-0.17	3.6-5.5	0	Low	0.24			0.0-0.5
KsB------------ Klej	0-8	2-10	1.30-1.60	6.00-20.00	0.06-0.11	3.6-5.5	0	Low	0.17	5	2	1.0-3.0
	8-24	2-10	1.30-1.60	6.00-20.00	0.06-0.10	3.6-5.5	0	Low	0.17			0.0-0.5
	24-72	2-10	1.50-1.75	6.00-20.00	0.06-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
Ma------------- Manahawkin	0-42	0	0.30-0.65	6.00-20.00	0.30-0.40	3.5-5.5	0-2		0.05	1	2	20.0-95.0
	42-72	0-10	1.10-1.70	2.00-20.00	0.04-0.08	4.5-5.0	0	Low	0.17			0.5-1.0
MC:												
Mannington----	0-6	8-15	1.00-1.20	0.20-0.60	0.16-0.22	5.6-7.3	0-4	Low	0.37	1	8	3.0-5.0
	6-40	20-34	0.40-1.20	0.20-0.60	0.16-0.25	5.6-7.3	0-4	Low	0.43			0.5-5.0
	40-80	---	0.10-0.50	2.00-20.00	0.35-0.45	6.1-7.3	0-4	Low				25.0-80.0
Nanticoke-----	0-6	8-15	0.10-0.70	0.20-0.60	0.15-0.25	5.6-7.3	0-4	Low	0.28	1	8	3.0-10.0
	6-40	18-25	0.10-0.70	0.20-0.60	0.10-0.20	5.6-7.3	0-4	Low	0.37			0.5-5.0
	40-72	27-35	0.10-0.80	0.20-0.60	0.10-0.20	5.6-7.3	0-4	Low	0.37			0.5-5.0
MeA------------ Matapeake	0-7	5-15	1.00-1.55	0.60-2.00	0.13-0.20	4.5-5.5	0	Low	0.37	5	3	1.0-2.0
	7-30	18-30	1.40-1.65	0.20-2.00	0.18-0.24	3.6-5.5	0	Low	0.43			0.0-0.5
	30-72	2-20	1.65-1.85	0.60-6.00	0.08-0.18	3.6-5.5	0	Low	0.28			0.0-0.5

Table 19.—Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wine erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
MeB------------	0-7	5-15	1.00-1.55	0.60-2.00	0.13-0.20	4.5-5.5	0	Low	0.37	5	3	1.0-2.0
Matapeake	7-30	18-30	1.40-1.65	0.20-2.00	0.18-0.24	3.6-5.5	0	Low	0.43			0.0-0.5
	30-72	2-20	1.65-1.85	0.60-6.00	0.08-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
MkA------------	0-10	5-15	1.00-1.45	0.60-2.00	0.20-0.28	4.5-5.5	0	Low	0.49	5	5	1.0-2.0
Matapeake	10-32	18-30	1.40-1.65	0.20-2.00	0.18-0.24	3.6-5.5	0	Low	0.43			0.0-0.5
	32-72	2-20	1.65-1.85	0.60-6.00	0.08-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
MkB------------	0-10	5-15	1.00-1.45	0.60-2.00	0.20-0.28	4.5-5.5	0	Low	0.49	5	5	1.0-2.0
Matapeake	10-32	18-30	1.40-1.65	0.20-2.00	0.18-0.24	3.6-5.5	0	Low	0.43			0.0-0.5
	32-72	2-20	1.65-1.85	0.60-6.00	0.08-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
MpA------------	0-8	10-18	1.10-1.45	0.60-2.00	0.13-0.20	3.6-5.5	0	Low	0.37	4	3	0.5-3.0
Mattapex	8-35	18-30	1.25-1.45	0.20-2.00	0.18-0.22	3.6-5.5	0	Low	0.43			0.0-0.5
	35-48	8-15	1.45-1.65	0.60-6.00	0.14-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
	48-72	3-8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
MpB------------	0-8	10-18	1.10-1.45	0.60-2.00	0.13-0.20	3.6-5.5	0	Low	0.37	4	3	0.5-3.0
Mattapex	8-35	18-30	1.25-1.45	0.20-2.00	0.18-0.22	3.6-5.5	0	Low	0.43			0.0-0.5
	35-40	8-15	1.45-1.65	0.60-6.00	0.14-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
	40-72	3-8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
MqA------------	0-12	10-18	1.10-1.45	0.60-2.00	0.20-0.28	3.6-5.5	0	Low	0.43	4	5	0.5-3.0
Mattapex	12-35	18-30	1.25-1.45	0.20-2.00	0.18-0.22	3.6-5.5	0	Low	0.43			0.0-0.5
	35-40	8-15	1.45-1.65	0.60-6.00	0.14-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
	40-72	3-8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
MqB------------	0-12	10-18	1.10-1.45	0.60-2.00	0.20-0.28	3.6-5.5	0	Low	0.43	4	5	0.5-3.0
Mattapex	12-35	18-30	1.25-1.45	0.20-2.00	0.18-0.22	3.6-5.5	0	Low	0.43			0.0-0.5
	35-40	8-15	1.45-1.65	0.60-6.00	0.14-0.18	3.6-5.5	0	Low	0.28			0.0-0.5
	40-72	3-8	1.50-1.80	6.00-20.00	0.05-0.08	3.6-5.5	0	Low	0.17			0.0-0.5
Mu:												
Mullica-------	0-14	2-7	1.20-1.60	6.00-20.00	0.06-0.10	3.5-5.0	0	Low	0.20	3	2	0.5-2.0
	14-72	5-25	1.30-1.65	0.60-20.00	0.02-0.10	3.5-5.0	0	Low	0.28			0.0-0.0
Berryland-----	0-17	1-5	1.30-1.45	6.00-20.00	0.06-0.08	3.6-4.4	0	Low	0.17	2	8	4.0-8.0
	17-24	3-10	1.50-1.60	2.00-6.00	0.04-0.08	4.5-5.0	0	Low	0.17			0.0-0.0
	24-44	3-10	1.50-1.60	2.00-20.00	0.04-0.14	4.5-5.0	0	Low	0.17			0.0-0.0
	44-72	3-10	1.50-1.60	2.00-20.00	0.04-0.14	4.5-5.0	0	Low	0.28			0.0-0.0
NnA------------	0-8	5-15	1.20-1.50	0.60-2.00	0.20-0.25	4.5-6.5	0	Low	0.43	4	5	1.0-2.0
Nassawango	8-27	18-30	1.40-1.65	0.20-0.60	0.18-0.25	3.5-5.5	0	Low	0.49			0.0-0.5
	27-34	10-20	1.40-1.65	0.60-2.00	0.18-0.25	3.5-5.5	0	Low	0.28			0.0-0.5
	34-72	2-10	1.65-1.85	6.00-20.00	0.08-0.15	3.5-5.5	0	Low	0.15			0.0-0.5
NnB------------	0-8	5-15	1.20-1.50	0.60-2.00	0.20-0.25	4.5-6.5	0	Low	0.43	4	5	1.0-2.0
Nassawango	8-27	18-30	1.40-1.65	0.20-0.60	0.18-0.25	3.5-5.5	0	Low	0.49			0.0-0.5
	27-34	10-20	1.40-1.65	0.60-2.00	0.18-0.25	3.5-5.5	0	Low	0.28			0.0-0.5
	34-72	2-10	1.65-1.85	6.00-20.00	0.08-0.15	3.5-5.5	0	Low	0.15			0.0-0.5
NsA------------	0-10	5-15	1.20-1.50	0.60-2.00	0.20-0.25	4.5-6.5	0	Low	0.43	4	5	1.0-2.0
Nassawango	10-14	5-15	1.20-1.50	0.60-2.00	0.20-0.25	4.5-6.5	0	Low	0.49			0.0-0.5
	14-30	18-30	1.40-1.65	0.20-0.60	0.18-0.25	3.5-5.5	0	Low	0.49			0.0-0.5
	30-36	10-20	1.40-1.65	0.60-2.00	0.18-0.25	3.5-5.5	0	Low	0.28			0.0-0.5
	36-60	2-10	1.65-1.85	6.00-20.00	0.08-0.15	3.5-5.5	0	Low	0.15			0.0-0.5
	60-72	8-20	1.40-1.70	0.20-2.00	0.15-0.24	3.5-5.5	0	Low	0.28			0.0-0.5

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
NsB------------	0-14	5-15	1.20-1.50	0.60-2.00	0.20-0.25	4.5-6.5	0	Low	0.43	4	5	1.0-2.0
Nassawango	14-30	18-30	1.40-1.65	0.20-0.60	0.18-0.25	3.5-5.5	0	Low	0.49			0.0-0.5
	30-36	10-20	1.40-1.65	0.60-2.00	0.18-0.25	3.5-5.5	0	Low	0.28			0.0-0.5
	36-43	2-10	1.65-1.85	6.00-20.00	0.08-0.15	3.5-5.5	0	Low	0.15			0.0-0.5
	43-72	8-20	1.40-1.70	0.20-2.00	0.15-0.24	3.5-5.5	0	Low	0.28			0.0-0.5
Ot-------------	0-12	15-28	1.20-1.50	0.60-2.00	0.16-0.24	4.5-5.5	0	Low	0.37	5	5	1.0-2.0
Othello	12-28	18-30	1.40-1.70	0.20-0.60	0.12-0.24	3.6-5.5	0	Low	0.43			0.0-0.5
	28-33	12-27	1.65-1.80	0.20-2.00	0.10-0.16	3.6-5.5	0	Low	0.28			0.0-0.5
	33-72	4-10	1.65-1.80	2.00-6.00	0.06-0.10	3.6-5.5	0	Low	0.15			0.0-0.5
Pk-------------	0-40	0	0.10-0.50	2.00-6.00	0.35-0.45	3.5-5.5	0-4	Low	0.02	1	8	45.0-90.0
Puckum	40-80	0	0.10-0.50	2.00-6.00	0.35-0.45	3.5-5.5	0-4	Low	0.02			30.0-75.0
Pu-------------	0-13	---	0.30-0.80	2.00-20.00	0.30-0.60	6.6-7.8	8-16	Low	0.02	1	8	25.0-70.0
Purnell	13-18	1-10	1.40-1.65	6.00-20.00	0.02-0.18	6.6-7.8	8-16	Low	0.10			0.5-1.0
	18-72	0-5	1.45-1.70	6.00-20.00	0.02-0.13	6.6-7.8	8-16	Low	0.15			0.5-1.0
RoA------------	0-22	3-10	1.52-1.71	6.00-20.00	0.04-0.10	3.8-5.5	0	Low	0.15	4	2	0.5-5.0
Rosedale	22-38	7-12	1.00-1.45	0.60-2.00	0.12-0.20	3.5-5.5	0	Low	0.28	4	5	1.0-2.0
	38-72	0-30	1.30-1.75	0.20-20.00	0.02-0.15	3.8-5.5	0	Moderate	0.28			0.5-1.0
RoB------------	0-23	3-10	1.52-1.71	6.00-20.00	0.04-0.10	3.8-5.5	0	Low	0.15	4	2	0.5-5.0
Rosedale	23-40	7-12	1.00-1.45	0.60-2.00	0.12-0.20	3.5-5.5	0	Low	0.28	4	5	1.0-2.0
	40-48	5-18	1.35-1.58	2.00-20.00	0.10-0.15	3.8-5.5	0	Low	0.15			0.5-1.0
	48-72	0-30	1.30-1.75	0.20-20.00	0.02-0.15	3.8-5.5	0	Moderate	0.28			0.5-1.0
RuA------------	0-18	4-10	1.50-1.75	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.17	5	2	0.5-3.0
Runclint	18-32	1-8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	0	Low	0.10			0.0-0.5
	32-66	1-8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	0	Low	0.05			0.0-0.5
	66-72	1-25	1.40-1.70	0.60-2.00	0.02-0.15	3.6-5.5	0	Low	0.20			0.0-0.5
RuB------------	0-8	4-10	1.50-1.75	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.17	5	2	0.5-3.0
Runclint	8-50	1-8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	0	Low	0.10			0.0-0.5
	50-60	1-8	1.50-1.75	6.00-20.00	0.02-0.10	3.6-5.5	0	Low	0.05			0.0-0.5
	60-72	1-25	1.40-1.70	0.60-2.00	0.02-0.15	3.6-5.5	0	Low	0.20			0.0-0.5
SaA------------	0-15	3-12	1.00-1.45	0.60-6.00	0.10-0.16	3.6-5.5	0	Low	0.28	5	3	1.0-2.0
Sassafras	15-37	18-27	1.40-1.65	0.20-2.00	0.11-0.22	3.6-5.5	0	Low	0.37			0.0-0.5
	37-72	3-16	1.40-1.70	0.60-20.00	0.04-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
SaB------------	0-15	3-12	1.00-1.45	0.60-6.00	0.10-0.16	3.6-5.5	0	Low	0.28	5	3	1.0-2.0
Sassafras	15-37	18-27	1.40-1.65	0.20-2.00	0.11-0.22	3.6-5.5	0	Low	0.37			0.0-0.5
	37-72	3-16	1.40-1.70	0.60-20.00	0.04-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
SaC------------	0-15	3-12	1.00-1.45	0.60-6.00	0.10-0.16	3.6-5.5	0	Low	0.28	3	3	1.0-2.0
Sassafras	15-37	18-27	1.40-1.65	0.20-2.00	0.11-0.22	3.6-5.5	0	Low	0.37			0.0-0.5
	37-72	3-16	1.40-1.70	0.60-20.00	0.04-0.12	3.6-5.5	0	Low	0.17			0.0-0.5
Su-------------	0-6	15-20	1.10-1.50	2.00-6.00	0.20-0.50	5.1-7.3	8-32	Low	0.20	1	8	10.0-15.0
Sunken	6-18	15-25	1.40-1.70	0.20-2.00	0.15-0.22	5.1-7.3	2-8	Low	0.43			1.0-3.0
	18-38	18-35	1.40-1.70	0.06-0.20	0.12-0.24	5.6-7.3	2-8	Low	0.43			0.0-0.5
	38-65	10-20	1.65-1.80	0.60-2.00	0.10-0.16	5.6-7.3	2-8	Low	0.17			0.0-0.5
	65-72	1-5	1.65-1.80	2.00-20.00	0.04-0.10	5.6-7.3	2-8	Low	0.17			0.0-0.5
Tk-------------	0-6	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.02	1	8	30.0-80.0
Transquaking	6-48	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.02			60.0-80.0
	48-66	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.05			25.0-80.0
	66-80	30-40	0.60-1.00	0.06-0.20	0.10-0.20	6.1-7.3	8-32	Moderate	0.10			0.5-20.0

Table 19.—Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wine erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
TP:												
Transquaking--	0-6	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.02	1	8	30.0-80.0
	6-48	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.02			60.0-80.0
	48-66	0	0.10-0.50	2.00-20.00	0.30-0.60	6.1-7.3	8-32	Low	0.05			25.0-80.0
	66-80	30-40	0.60-1.00	0.06-0.20	0.10-0.20	6.1-7.3	8-32	Moderate	0.10			0.5-20.0
Mispillion----	0-40	0	0.10-0.80	2.00-6.00	0.35-0.45	5.1-7.8	8-16	Low	0.02	1	8	20.0-90.0
	40-80	15-35	1.20-1.70	0.20-0.60	0.10-0.20	5.1-7.8	8-16	Low	0.28			2.0-10.0
Uc:												
Urban land.												
Acquango------	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	0.0-1.0
	3-20	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	20-26	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	26-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
Um:												
Urban land.												
Askecksy------	0-10	1-10	1.40-1.60	6.00-20.00	0.03-0.10	3.8-6.0	0	Low	0.10	5	2	1.0-5.0
	10-34	1-10	1.40-1.70	6.00-20.00	0.03-0.10	3.8-6.0	0	Low	0.10			0.5-1.0
	34-72	2-5	1.40-1.80	6.00-25.00	0.02-0.05	3.8-6.0	0	Low	0.05			0.5-1.0
Un:												
Urban land.												
Brockatonorton	0-3	1-5	1.30-1.60	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.10	5	1	1.0-3.0
	3-24	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	24-50	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
	50-60	0	0.10-0.50	2.00-20.00	0.25-0.40	4.5-7.8	0-8	Low	0.02			30.0-80.0
	60-72	1-5	1.60-1.80	6.00-20.00	0.02-0.08	4.5-7.8	0-8	Low	0.15			0.0-0.5
Ur.												
Urban land												
Ut:												
Urban land.												
Udorthents----	0-8	3-8	1.40-1.65	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.10	5	2	0.0-1.0
	8-12	5-20	1.40-1.65	6.00-20.00	0.01-0.10	3.6-5.5	0	Low	0.17			0.0-0.5
	12-72	3-20	1.55-1.80	2.00-20.00	0.05-0.20	3.6-5.5	0	Low	0.15			0.0-0.5
Uz-------------	0-8	3-8	1.40-1.65	6.00-20.00	0.05-0.10	3.6-5.5	0	Low	0.10	5	2	0.0-1.0
Udorthents	8-12	5-20	1.40-1.65	6.00-20.00	0.01-0.10	3.6-5.5	0	Low	0.17			0.0-0.5
	12-72	3-20	1.55-1.80	2.00-20.00	0.05-0.20	3.6-5.5	0	Low	0.15			0.0-0.5
WdA------------	0-10	5-18	1.00-1.40	0.60-6.00	0.08-0.16	3.6-5.5	0	Low	0.24	4	3	1.0-2.0
Woodstown	10-37	18-30	1.35-1.70	0.20-6.00	0.06-0.16	3.6-5.5	0	Low	0.28			0.0-0.5
	37-72	5-20	1.35-1.65	0.60-6.00	0.06-0.16	3.6-5.5	0	Low	0.28			0.0-0.5
WdB------------	0-10	5-18	1.00-1.40	0.60-6.00	0.08-0.16	3.6-5.5	0	Low	0.24	4	3	1.0-2.0
Woodstown	10-37	18-30	1.35-1.70	0.20-6.00	0.06-0.16	3.6-5.5	0	Low	0.28			0.0-0.5
	37-72	5-20	1.35-1.65	0.60-6.00	0.06-0.16	3.6-5.5	0	Low	0.28			0.0-0.5
Zk-------------	0-3	8-15	1.20-1.50	0.60-2.00	0.12-0.22	3.5-5.5	0-2	Low	0.43	1	8	5.0-18.0
Zekiah	3-20	8-18	1.20-1.50	0.60-2.00	0.10-0.20	3.5-5.5	0-2	Low	0.43			1.0-5.0
	20-27	5-15	1.30-1.50	2.00-6.00	0.10-0.20	3.5-5.5	0-2	Low	0.28			2.0-18.0
	27-37	5-15	1.30-1.60	2.00-6.00	0.08-0.15	3.5-5.5	0-2	Low	0.24			1.0-18.0
	37-50	5-18	1.30-1.60	2.00-6.00	0.10-0.20	3.5-5.5	0-2	Low	0.15			1.0-5.0
	50-72	2-8	1.50-1.70	2.00-20.00	0.05-0.10	3.5-5.5	0-2	Low	0.15			1.0-5.0

Table 20.—Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
AcB, AcC Acquango	A	Occasional	Very brief	Jan-Dec	6.0		---
As Askecksy	A/D	None		---	0-1.0	Apparent	Dec-May
Be Beaches	D	Frequent	Long	Jan-Dec	0-6.0	Apparent	Jan-Dec
Bh Berryland	B/D	Rare		---	+.5-0.5	Apparent	Oct-Jun
BkA, BkB Brockatonorton	D	Occasional	Very brief	Jan-Dec	2.0-3.0	Apparent	Jan-Dec
Br Broadkill	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
BX:							
Boxiron	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
Broadkill	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
CeA, CeB:							
Cedartown	A	None		---	3.5-6.0	Perched	Dec-Apr
Rosedale	A	None		---	4.0-6.0	Apparent	Dec-Apr
Ch Chicone	D	Occasional	Brief	Jan-Dec	+1-0.5	Apparent	Nov-Jun
Ek, Em Elkton	C/D	None		---	0-1.0	Apparent	Nov-May
EvA, EvB, EvC Evesboro	A	None		---	6.0		---
Fa Fallsington	B/D	None		---	0-1.0	Apparent	Dec-May
FmA, FmB Fott Mott	A	None		---	6.0		---
GaA, GaB, GaC Galestown	A	None		---	6.0		---
HbA, HbB Hambrook	B	None		---	4.0-6.0	Apparent	Jan-May
HmA, HmB Hammonton	B	None		---	1.5-3.5	Apparent	Jan-Apr
Hu Hurlock	B/D	None		---	0-1.0	Apparent	Dec-May

Table 20.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
In----------------------- Indiantown	D	Frequent	Brief	Jan-Dec	+.5-0.5	Apparent	Sep-Jun
Ke----------------------- Kentuck	B/D	None		---	+1-0.5	Apparent	Dec-Jun
KsA, KsB----------------- Klej	B/D	None		---	1.0-2.0	Apparent	Dec-Apr
Ma----------------------- Manahawkin	D	Frequent	Brief	Jan-Mar	+1-0	Apparent	Oct-Jul
MC: Mannington--------------	D	Frequent	Very brief	Jan-Dec	+1-0.5	Apparent	Jan-Dec
Nanticoke---------------	D	Frequent	Very brief	Jan-Dec	+1-0.5	Apparent	Jan-Dec
MeA, MeB, MkA, MkB------- Matapeake	B	None		---	6.0		---
MpA, MpB, MqA, MqB------- Mattapex	C	None		---	1.5-3.0	Apparent	Jan-Apr
Mu: Mullica-----------------	C	Rare		---	0-0.5	Apparent	Dec-May
Berryland---------------	B/D	Rare		---	+.5-0.5	Apparent	Oct-Jun
NnA, NnB, NsA, NsB------- Nassawango	B	None		---	3.5-6.0	Perched	Dec-Apr
Ot----------------------- Othello	C/D	None		---	0-1.0	Apparent	Jan-May
Pk----------------------- Puckum	D	Frequent	Brief	Jan-Dec	+1-0	Apparent	Jan-Dec
Pu----------------------- Purnell	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
RoA, RoB----------------- Rosedale	A	None		---	4.0-6.0	Apparent	Dec-Apr
RuA, RuB----------------- Runclint	A	None		---	4.0-6.0	Apparent	Jan-May
SaA, SaB, SaC------------ Sassafras	B	None		---	6.0		---
Su----------------------- Sunken	D	Occasional	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
Tk----------------------- Transquaking	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
TP: Transquaking------------	D	Frequent	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec
Mispillion--------------	D	Frequent	Brief	Jan-Dec	+1-0	Apparent	Jan-Dec

Table 20.—Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
Uc:							
Urban land		None		---	2.0		---
Acquango	A	Occasional	Very brief	Jan-Dec	6.0		---
Um:							
Urban land		None		---	2.0		---
Askecksy	A/D	None		---	0-1.0	Apparent	Dec-May
Un:							
Urban land		None		---	2.0		---
Brockatonorton	D	Occasional	Very brief	Jan-Dec	2.0-3.0	Apparent	Jan-Dec
Ur Urban land		None		---	2.0		---
Ut:							
Urban land		None		---	2.0		---
Udorthents	A/D	None		---	0-6.0	Apparent	Nov-May
Uz Udorthents	A/D	None		---	0-6.0	Apparent	Nov-May
WdA, WdB Woodstown	C	None		---	1.5-3.5	Apparent	Jan-Apr
Zk Zekiah	D	Frequent	Brief	Jan-Dec	0-1.0	Apparent	Sep-Jun

Table 21.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Depth to bedrock	Subsidence		Potential frost action	Risk of corrosion	
		Initial	Total		Uncoated steel	Concrete
	In	In	In			
AcB, AcC: Acquango	60	0	---	Low	High	High
As: Askecksy	72	---	---	None	High	High
Be: Beaches	60	0	---	Low	High	High
Bh: Berryland	60	0	---	Low	High	High
BkA, BkB: Brockatonorton	60	0	---	Low	High	High
Br: Broadkill	60	0-8	8-12	Low	High	High
BX:						
Boxiron	60	7-12	12-15	Low	High	High
Broadkill	60	0-8	8-12	Low	High	High
CeA, CeB:						
Cedartown	60	0	---	Low	Moderate	High
Rosedale	72	0	---	None	Low	High
Ch: Chicone	60	0	---	Moderate	High	High
Ek, Em: Elkton	60	0	---	Moderate	High	High
EvA, EvB, EvC: Evesboro	60	0	---	Low	Low	High
Fa: Fallsington	60	0	---	Moderate	High	High
FmA, FmB: Fort Mott	60	0	---	Moderate	Moderate	High
GaA, GaB, GaC: Galestown	60	0	---	Low	Low	High
HbA, HbB: Hambrook	60	0	---	Moderate	Moderate	High
HmA, HmB: Hammonton	60	0	---	High	Moderate	High
Hu: Hurlock	60	0	---	Moderate	High	High
In: Indiantown	60	0	---	Moderate	High	High

Table 21.—Soil Features--Continued

Map symbol and soil name	Depth to bedrock	Subsidence		Potential frost action	Risk of corrosion	
		Initial	Total		Uncoated steel	Concrete
	In	In	In			
Ke------------------ Kentuck	60	0	---	Moderate	High	High
KsA, KsB----------- Klej	60	0	---	Moderate	Low	High
Ma------------------ Manahawkin	60	6-12	18-32	High	High	High
MC:						
Mannington---------	60	---	---	Low	High	High
Nanticoke----------	60	0	---	Low	High	High
MeA, MeB, MkA, MkB- Matapeake	60	0	---	Moderate	Moderate	High
MpA, MpB, MqA, MqB- Mattapex	60	0	---	Moderate	High	High
Mu:						
Mullica------------	60	0	---	High	High	High
Berryland----------	60	0	---	Low	High	High
NnA, NnB, NsA, NsB- Nassawango	60	0	---	Moderate	Moderate	High
Ot------------------ Othello	60	0	---	Moderate	High	High
Pk------------------ Puckum	60	10-20	20-40	Low	High	High
Pu------------------ Purnell	60	7-12	12-15	Low	High	High
RoA, RoB----------- Rosedale	72	0	---	None	Low	High
RuA, RuB----------- Runclint	60	0	---	Low	Low	High
SaA, SaB, SaC------ Sassafras	60	0	---	Moderate	Low	High
Su------------------ Sunken	60	0	---	Moderate	High	High
Tk------------------ Transquaking	60	15-25	25-35	Low	High	High
TP:						
Transquaking-------	60	15-25	25-35	Low	High	High
Mispillion---------	60	10-20	20-40	Low	High	High
Uc:						
Urban land---------	10	0	---	None		
Acquango-----------	60	0	---	Low	High	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Depth to bedrock	Subsidence		Potential frost action	Risk of corrosion	
		Initial	Total		Uncoated steel	Concrete
	In	In	In			
Um:						
Urban land	10	0	---	None		
Askecksy	72	---	---	None	High	High
Un:						
Urban land	10	0	---	None		
Brockatonorton	60	0	---	Low	High	High
Ur Urban land	10	0	---	None		
Ut:						
Urban land	10	0	---	None		
Udorthents	60	0	---	Low	High	High
Uz Udorthents	60	0	---	Low	High	High
WdA, WdB Woodstown	60	0	---	Moderate	Moderate	High
Zk Zekiah	60	0	---	Moderate	High	High

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