United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the Virgin Islands Department of Planning and Natural Resources; the Virgin Islands Cooperative Extension Service; and the United States Department of Interior, National Park Service

Soil Survey of the United States Virgin Islands

How to Use This Soil Survey

General Soil Map

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

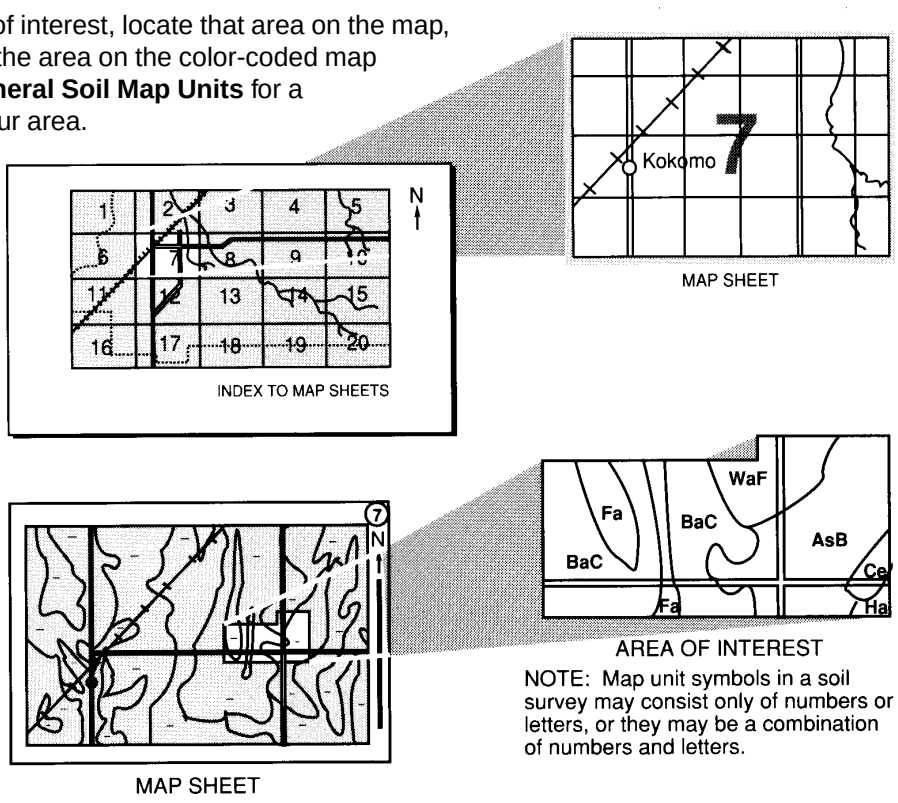
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

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

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

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



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

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, territory 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 1994. Soil names and descriptions were approved in 1994. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service and the Virgin Islands Department of Planning and Natural Resources; the Virgin Islands Cooperative Extension Service; and the United States Department of Interior, National Park Service. The survey is part of the technical assistance furnished to the United States Virgin Islands Soil and Water Conservation District.

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

Cover: An aerial view of Charlotte Amalie, which is the center of government for the United States Virgin Islands, located on St. Thomas Island.

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 2000

Foreword

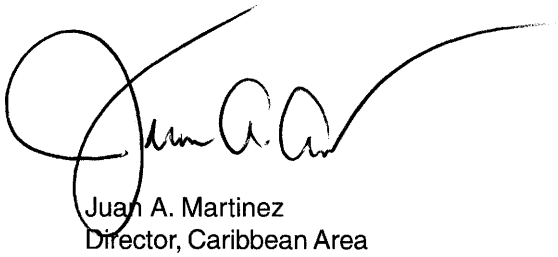
This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

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

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

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



Juan A. Martinez
Director, Caribbean Area
Natural Resources Conservation Service

Soil Survey of the United States Virgin Islands

By John R. Davis, Natural Resources Conservation Service

Fieldwork by John R. Davis and Carmen L. Santiago, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Virgin Islands Department of Planning and Natural Resources; the Virgin Islands Cooperative Extension Service; and the United States Department of Interior, National Park Service

The UNITED STATES VIRGIN ISLANDS are part of a chain of islands that is called the "Lesser Antilles" (fig. 1). This chain extends toward the southeast from the island of Puerto Rico. The United States Virgin Islands consist of St. Croix, St. Thomas, St. John, and Water Island and numerous smaller islands, cays, and reefs. The islands are bounded on the north by the Atlantic Ocean and on the south by the Caribbean Sea. The United States Virgin Islands are approximately 1,100 miles southeast of Miami, Florida, and are directly to the west of the British Virgin Islands.

According to the 1990 population census, the islands had a population of 101,809 in 1990 *(36)*. The main communities are Charlotte Amalie, which is the capital of the Virgin Islands, on St. Thomas; Christiansted (fig. 2) and Frederiksted on St. Croix; and Cruz Bay on St. John. The University of the Virgin Islands has campuses on St. Thomas and St. Croix.

The total area of the survey area is 84,480 acres, or about 33,928 hectares. The Natural Resources Conservation Service Field Office and Resource Conservation and Development Office are on St. Croix.

Approximately 13,666 acres, or 16 percent of the total land area, is used for agricultural uses. More than 78 percent of this acreage is used as pasture or for grazing livestock. Some of the main crops grown are herbs and spices, sugarcane, coconuts, sweet potato, yams, and cassava. The commonly grown vegetable crops include cucumber, eggplant, okra, peppers, and tomatoes. Avocados, bananas, papayas, soursop, sugarapple, guavaberry, citrus fruits, and mangos are the main fruit crops grown on the islands *(37)*.

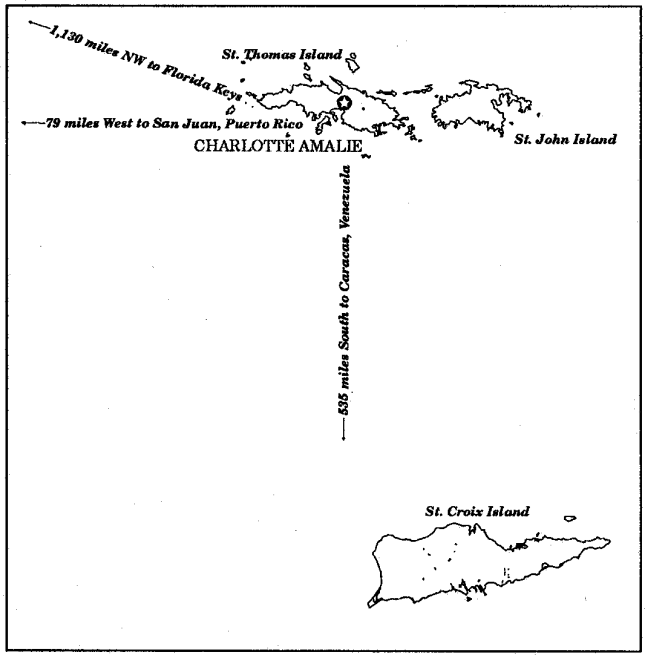


Figure 1.—Location of the United States Virgin Islands.

This soil survey updates an earlier survey of the United States Virgin Islands, published in 1970 *(27)*. It provides additional information and shows the soils in greater detail.

Figure 2.—View of Christiansted, St. Croix Island. Victory-Southgate complex, 40 to 70 percent slopes, very stony, is the dominant soil map unit in the surrounding hills.

General Nature of the Soil Survey Area

Mary Lou Dabbs, Librarian II, Auburn University, helped to prepare this section.

This section provides information on climate; history and development; transportation; water supply; physiography, relief, and drainage; natural vegetation; and geology of the United States Virgin Islands.

Climate

Wind circulation throughout the Lesser Antilles region is dominated by the easterly tradewinds. The climate is maritime tropical and is characterized by generally fair weather, steady winds, and slight but regular annual, seasonal, and diurnal ranges in temperature. Rain-producing weather systems generally move into the Virgin Islands from the east in summer and from the northwest in winter. From June through November, these weather systems are in the form of tropical waves that develop in the tropical tradewind belt. Some of these waves develop into tropical depressions, tropical storms, or hurricanes, especially during August and September.

From December through May, the weather-producing systems are frontal systems and low-pressure troughs that move in from the northwest. These frontal systems transport cold Canadian air into the Caribbean region.

Rainfall. Major rainfall events are associated with weather systems that enhance the uplift of moist air in the region. Orographic lifting of moist air over hilly

terrain is the most common cause of rainfall on the islands. The amount of rainfall increases with increasing elevation. The total annual rainfall differs substantially at various locations throughout the islands. Most areas on St. Thomas and St. John receive between 30 and 60 inches of rain annually, although the windward coastal areas on both islands receive less. St. Croix has a variable amount of annual rainfall. The total annual rainfall is more than 50 inches in the northwestern part of the island, about 25 to 35 inches on the southwestern coast, about 40 to 50 inches on the south-central coast, and about 20 to 30 inches in the eastern part of the island. Leeward aspects receive greater amounts of rain because clouds develop over the slopes on a daily basis. In general, days have a higher incidence of rainfall than nights.

The Virgin Islands have no sharply defined wet season or dry season. The wettest period generally is from September to November, and the driest period is from January to June. Occasionally, intense rainfall occurs during the drier period. Table 1 shows the monthly average rainfall from 18 sites throughout the Virgin Islands over a 30-year period.

Temperature. The difference between the mean temperatures of the coolest and warmest months is only about 5 to 7 degrees F. The highest temperatures are in August or September, and the lowest are in January or February. During the warmest months, the highest average daytime temperature is about 88 degrees F. Warm spells can occur for short periods, and during this time the temperature can reach into the low 90's for several days in succession. The average low nighttime temperatures during the warmest months are generally between 74 and 78 degrees F. During the coldest months, the highest temperature is generally in the low 80's, and the lowest is in the high 60's. Table 1 shows the monthly average air temperatures from 8 sites throughout the United States Virgin Islands over a 30-year period.

Evaporation. The steady flow of tradewinds and the warm temperatures result in high evaporation rates. Open-pan measurements taken at Anna's Hope indicate evaporation rates that exceed the average annual rainfall. Table 1 shows the potential evapotranspiration, as estimated by the Thornthwaite formula, in inches of water per month.

Relative humidity. The average relative humidity, over a 6-year period, at Henry E. Rohlsen Airport on St. Croix and Cyril E. King Airport on St. Thomas is summarized, by months, in table 2. Throughout the year, the relative humidity and the salt content of the air are sufficiently high to result in corrosion and deterioration of buildings and exposed metal surfaces.

Wind. The tradewinds are one of the most dependable weather phenomena on the islands. Almost without exception, the tradewinds blow from an easterly direction. The wind velocity varies throughout the season. Leeward slopes are protected against the full force of the tradewinds, but the flow is strong enough to pass over the higher terrain and influence the leeward slopes. Table 3 shows the seasonal wind direction and speed throughout the United States Virgin Islands *(21)*.

Hurricanes and tropical storms. The islands are affected occasionally by tropical storms and hurricanes. Most storms develop from August to October. The storms that develop over the South Atlantic, east of the Antilles chain, usually pass to the north or south of the islands. More than 50 storms, including 36 hurricanes, have affected the islands since 1867. Hurricane-force winds are estimated to impact the area once every 16 years *(4)*.

Drought. Periods of drought occur almost every year in some parts of the Virgin Islands. Although some of these periods are of short duration, they have a serious impact on farming, beef, and dairy activities; on the public water supply; and on the general economy of the islands. More serious multiple-year, moderate or severe regional droughts have occurred in every decade since the 1930's.

Flooding. Flooding is a major concern in the Virgin Islands because of the stream-flow characteristics and topography of the area. Streams are not perennial, and watershed areas have a high percentage of very steep slopes. Short periods of intense rainfall can result in high-volume runoff that can ultimately lead to short duration, localized flooding as water rushes from mountainous areas to less steep areas and to the sea. Major floods are generally related to tropical storms that deliver high-intensity rainfall over a period of several days *(38)*.

History and Development

Admiral Christopher Columbus discovered the Virgin Islands during his second voyage to the New World in 1493.

During the 1600's, European powers claimed and settled Caribbean islands. At various times, Holland, France, England, Spain, Denmark, and the Knights of Malta all struggled to claim the Virgin Islands. By 1718, the St. Thomas Danes were strong enough to expand to St. John. They built a fort at Coral Bay. In 1733, Denmark purchased St. Croix from France, thus uniting what are today the three major United States Virgin Islands.

Figure 3.—Old sugar mill ruins on St. Croix Island. Sugar production began to decline by the middle of the 19th century.

In 1724, the Danish Crown declared St. Thomas a free port, which is a status that the Virgin Islands have enjoyed since that time. The islands continued to grow and prosper as the sugar plantations thrived, and St. Thomas became an important trading center due to its position with nearby Spanish, English, and French colonies.

By the mid-1800's, the profitable sugar trade was in a state of decline because of competition with other islands, and much of the cultivated land was converted to pasture (fig. 3).

In 1867, the United States began negotiations with Denmark to purchase the Virgin Islands, but it was not until 1917 that the sale was completed for $25 million. The United States purchased the islands because of their strategic proximity to the Panama Canal.

Between 1900 and 1970, the wholesale abandonment of agricultural land occurred. Since 1970, the population has tripled, and the islands have become more industrialized, more urban, and less agrarian. The economy currently depends upon tourism, government, petroleum processing, aluminum, and small-business industries *(7, 12)*.

Transportation

The Henry E. Rohlsen Airport on St. Croix and the Cyril E. King Airport on St. Thomas provide connection services for many major airlines and regional services for smaller airline companies. Modern dock facilities at Frederiksted and Charlotte Amalie provide service for an increasing number of large cruise ships. Smaller facilities at Gallow's Bay, Charlotte Amalie, Red Hook, and Cruz Bay service smaller vessels.

Interisland charter ferry services are available, and these ferries also provide service between St. Croix, St. Thomas, Water Island, St. John, the British Virgin Islands, and Fajardo in Puerto Rico.

Ground transportation in the mountainous regions of St. Croix and throughout St. Thomas and St. John islands is dependent on a network of irregular, winding, and often steep roads. The Melvin Evan Highway in St. Croix is the only dual-lane highway in the territory, and it provides access to the airport and areas to the west of Sunny Isles.

Water Supply

Urban areas in the islands, including Christiansted, Frederiksted, Charlotte Amalie, and Cruz Bay, rely on desalinated seawater as a water supply. Rural areas depend mainly on rainwater collected from roof-top rain catchments, or cisterns, and, to a lesser extent, ground water supplies. The main problems associated with using ground water for domestic uses are the excessive depth to ground water, the intrusion of seawater, and the contamination of aquifers by wastewater and petroleum.

The main aquifers in the United States Virgin Islands are the Kingshill aquifer in central St. Croix, coastal embayment, and volcanic rock aquifers in the three major islands.

The main problem that confronts producers on the islands is retaining sufficient soil moisture to produce crops that are otherwise suited to the soils and climate. Drought is a more serious concern than ever before in recent history. Many once-dependable wells have gone dry or have become contaminated. Subterranean reservoirs have become depleted even though, according to records, the islands receive about the same amount of rainfall as in past periods of time. Ground water provides about 20 percent of the freshwater supply. The aquifers in these three islands have relatively poor yields and poor water quality. In most areas, the yields are less than 15 gallons per minute and the concentration of dissolved-solids is more than 1,000 milligrams per liter.

The depletion of the ground water supply is the result of poor soil management practices. Large areas were cleared of the original forest cover and were subsequently cultivated and then abandoned. Urban development has significantly increased the amount of impervious surfaces, such as roads, sidewalks, parking lots, and buildings. Consequently, most of the rainfall is lost through runoff and evaporation. Only a small amount of water infiltrates the soil and is absorbed. The infiltration of water is reduced as paved gutters, storm sewers and other artificial drainage structures rapidly transport rainwater to the sea *(18, 22)*.

Physiography, Relief, and Drainage

St. Croix is the largest island and the most easterly possession of the United States. It is about 100 miles south-southeast of San Juan, Puerto Rico. The length of the island is about 22 miles along the east-west axis. The widest part of the west end is about 6 miles, while the east end tapers to less than 1 mile in width along a north-south axis. The total area of the island is about 53,480 acres, or 85 square miles.

St. Thomas, which is the second largest island, is approximately 40 miles north of St. Croix and 60 miles east of Puerto Rico. It is about 13 miles long and 3 miles wide. The total area is about 19,000 acres, or 32 square miles.

St. John is about 2 miles east of St. Thomas and is separated from the island by Pillsbury Sound. It is about 7 miles long and 3 miles wide. The total area is about 12,000 acres, or 19 square miles. About 60 percent of the island is within the Virgin Islands National Park.

Water Island is directly south-southwest of Charlotte Amalie. It is separated from St. Thomas by the West Gregerie Channel. The total area is approximately 500 acres. It is currently being transferred to the United States Virgin Islands government from the United States Department of Interior.

The island of St. Croix is characterized by a mountainous area in the northern part and a broad, rolling coastal plain in the southern part. The mountainous area is separated into east and west ranges by ancient marine sediments that extend in a southwest direction from an area near Christiansted and include the south-central and southwestern parts of St. Croix. The alluvium transported from these ranges is deposited in wide, frequently merging, alluvial fans that have buried ancient marine sediments at variable depths. More recent, exposed marine terraces are in the south-central, southwestern, and coastal areas, including the Frederiksted area.

The mountainous areas are characterized by

numerous narrow, steep-sided valleys that have been cut by water flowing down the guts, or intermittent streams, generally in a north to south direction. Mt. Eagle, which is in the western range, is the highest peak on St. Croix. It is at an elevation of 1,165 feet above sea level.

St. Thomas and St. John are characterized by irregular coastlines, numerous bays, very steep slopes, rubbly guts, and small acreages of watersheds. Almost no areas of coastal plains are in the region because volcanic mountains dominate the topography. Crown Mountain is the highest peak on St. Thomas. It is at an elevation of 1,556 feet above sea level. Bordeaux Mountain, which is the highest peak on St. John, is at an elevation of 1,297 feet above sea level.

Streams flow mainly during periods of intense rainfall, and ground water supplies are limited. Because of the extremely steep topography and small watershed basins, gutflow responds quickly to rainfall *(7, 38)*.

Natural Vegetation

Gregory R. Brannon, soil data quality specialist, and Rudy G. O'Reilly, soil conservationist, Natural Resources Conservation Service, prepared this section.

The natural vegetation in the United States Virgin Islands can be classified as coastal vegetation, thicket vegetation, forest vegetation, or freshwater vegetation *(3)*.

Coastal Vegetation

Coastal vegetation can be subdivided into mangrove vegetation along sheltered, muddy coasts; seashore vegetation on sandy, open coasts; and vegetation along the rock coasts.

The mangroves grow partly in shallow seawater and partly on a low, moist, saline bottoms from which water has drained. Scattered areas of individual trees are far from the shore. With increasing proximity to the shore, the trees become larger in size and aggregate into small clusters that eventually merge into a forest. The mangrove forest is composed of three species: *Laguncularia racemosa,* or white mangrove; *Avicennia germinans,* or black mangrove; and *Rhizophora mangle,* or red mangrove, mangle tree, or mangle baum. *Laguncularia racemosa* grows nearest to the shore. *Avicennia germinans* is in middle positions in very shallow water or on nearly dry land. *Rhizophora mangle* is furthest from the shore, in deeper water, where it grows on long roots that provide a stilt-like appearance.

A transitional area, behind the mangrove vegetation, consists of *Conocarpus erecta,* a small tree or shrub which is known as buttonwood. Also in this area is another small tree or shrub, *Annona glabra,* which is commonly called bunya or alligator apple. This shrub has a yellowish, edible fruit. *Bucida buceras* and the large fern *Acrostichum danaeifolium* grows in areas where small streams empty into lagoons.

The convolvulaceous plant, *Ipomaea pes caprae,* grows on tropical beaches. It has straight vines that can be several feet long, and it creeps along the shore, sending roots into the sand. Interspersed with areas of this plant are several types of grasses that have a bluish-green hue. A few fleshy plants, such as *Sesuvium portulacastrum* (sea purslane), *Blutaparon vermiculatre* (bay flower), and *Chamaesyce buxifolia* (wolf's milk) are also found along the beach.

Tournefortia gnaphalodes is a shrub that grows in the most exposed areas. It can attain a height of more than three feet and can form a thick, impenetrable wall that faces windward. Other shrubs include *Suriana maritima,* which has thick, upward-pointing leaves, and *Ernodea littoralis,* which has narrow, elliptical leaves that are pointed at both ends.

Beyond the shrubs is *Coccoloba uvifera,* or seaside grape, facing the sea, and *Hippomane mancinella,* or Manschineel tree, behind it. In exposed areas, seaside grape is no more than a shrub. In protected areas, it can attain a height of more than 20 feet. The leaves are stiff and leathery. The Manschineel tree is tall and has a large trunk with shining, dark-green foliage. This tree is extremely toxic, and a caustic and highly poisonous milk sap flows profusely when it is scratched or cut. The small, poisonous fruit resembles an apple and has a pleasant aroma. The coconut palm, or *Cocos nucifera,* is also found on these forested, sandy beaches.

Except in the most wind-swept areas, the shrubs or low forest vegetation found on the sandy beaches are also found on the rocky coastlines. One additional plant in these areas is *Plumieria alba,* or white frangipanni or nosegay tree. This plant has thick branches and leaves that have a whitish color on the underside of the end of the branches. Also present are several species of the genus *Coccoloba,* which have somewhat smaller leaves than the seaside grape. Some cactus plants in the genuses *Cereus* and *Opuntia* are commonly near the water's edge, especially on the islands of St. Thomas and St. John. On the northern coast of St. John, small fan palms of the genus *Coccothrinax alta* grow in high places that are only occasionally reached by spray from the sea.

Thicket Vegetation

The thicket vegetation is commonly known as "the bush." It is well developed in the eastern part of St. Croix. The vegetation is dominated by *Croton flavens, Croton betulinus,* and *Croton astroites.* It also consists of other types of shrubs, primarily species of the genus

Lantana, Wedelia fruticosa, Corchorus hirsutus, and *Melochia tomentosa*. All of these plants have hairy leaves, and some lose their leaves in the dry season. The wild cotton plant, *Gossypium barbadense,* is also common.

A few trees are in the thicket, especially in areas where moisture is more abundant. One such tree is the Calabash Tree, *Crescentia cujete,* which has thick, stiff, and wide branches. It bears large, hard-shelled, gourd-like fruits. Other trees that are in the thicket include *Annona squamosa,* or sugar apple or sweetsop, *Acacias farnesiana and Acacia tortuosa,* or Acacias trees, and *Haematoxylum campechianum,* or the logwood or Campeachy tree.

In areas where moisture conditions are more favorable, the shrubs in the thicket increase in size and the trees increase in number. These areas are called "thicket woods," and they are in several places on the south side of St. Thomas and St. John and are fairly common on St. Croix. In contrast to the croton thickets, the thicket woods have a dark green color and are often covered with showy flowers after rains in the spring.

The thicket woods are composed of several species of plants. They are generally dense and are often impenetrable. Plants such as *Acacia retusa* (Catch-and-Keep), several species of cacti, and penguin *(Bromelia penguin)* make these areas difficult to traverse.

Several species of epiphytes and true parasites are in the thicket woods areas. *Tillandsia recurvata* and *Tillandsia utriculata* of the pineapple family clasp branches with short and slightly developed roots. They have gouge-shaped leaves that collect moisture from dew and rain and store it in large hollows at the base of the leaves. A few orchids, primarily of the genus *Epidendron* also are in these areas. They have thick, club-shaped stems in which the plant stores water for use in periods of drought. A species of dodder, or *Cuscuta americana,* is a common parasitic plant. It covers shrubs and trees with a thick network of yellow, thread-like branches.

Forest Vegetation

A gradual transition from the thickets to forest vegetation occurs extensively on St. John and in smaller areas on St. Thomas. A few areas of forest vegetation are on St. Croix.

The silk cotton tree, *Ceiba pentandra,* is a dominant species in these areas. It has a large trunk, which has high roots that extend from all sides. Its name is derived from the soft, silky down, known as capoc, which covers the seeds and the inside of the capsules. It sheds its leaves and is usually bare during the months of February and March. Its primary branches are very thick and are covered with epiphytes.

Other large, deciduous trees include the hog plum, *Spondias mombin,* which attains a considerable size and bears a yellow, edible fruit; and the sandbox tree, *Hura crepitans,* which is a tall tree that has a slender trunk studded with large thorns. The sandbox tree bears a capsular fruit that, upon ripening, bursts with a loud noise and hurls seeds in all directions.

Evergreens include the fig tree, *Ficus citrifolia,* which can grow to a very large dimension and is distinguished by numerous aerial roots that hang down from the branches of the tree. At ground level, the roots increase in thickness and often unite with one another, giving the appearance of individual trunks. The seeds of the fig tree commonly germinate on another tree, often at a considerable height from the ground. The fig tree holds on to the tree by some of the roots, while others grow to the ground. The roots then surround the host tree and eventually kill it. The *Clusia rosea,* or strangler fig, is common on St. John and grows in the same manner. Other evergreens include the moss apple tree, *Manilkara zapota,* and the soursop tree, *Annona muricata*. They bear edible fruits. The star apple, *Chrysophyllum cainito,* has leaves that are a golden color on the underside, and the cashew, *Anacardium occidentale,* produces an edible nut. In most of the valleys along water courses, cabbage palm, *Roystonea borinquena,* is common. On the islands of St. Thomas and St. John, numerous smaller fan palms, *Coccothrinax alta*, are common. These palms are very rare on St. Croix.

The understory vegetation consists of numerous shrubs and smaller trees. The guava berry, *Myrciaria floribunda,* and the bay tree, *Pimenta racemosa,* are small trees. The bay tree is very common in the higher elevations of St. John. Bay oil is distilled from its leaves. Several species of shrubs that belong to the genus *Psychotria* and the nightshade family *Solanum* are in the area.

The forest vegetation differs between the three islands of St. Croix, St. Thomas, and St. John. In the wooded regions of St. Croix, mostly north of Blue Mountain, the trumpet wood tree, *Cecropia peltata,* is one of the main species. This tree is rare on the other islands. In general, the flora growing on St. Thomas and St. John islands is more diverse than that of St. Croix.

Freshwater Vegetation

No natural lakes or ponds are in the United States Virgin Islands, and most of the water courses are dry during most of the year. The Kingshill Gut on the southern side of St. Croix is an exception. It forms a

few small pools that contain some species of freshwater vegetation. *Nymphaea ampla,* a waterlily that has white flowers, is common in these areas. Duckweed, or *Lemna minor,* floats on the surface of the water. Along the edges of the pools are several grasses and sedges of the genus *Cyperus.*

Geology of the Northern United States Virgin Islands

Douglas W. Rankin, scientist emeritus, United States Geological Survey, prepared this section.

St. Thomas and St. John, which make up the northern United States Virgin Islands, and the British Virgin Islands and Puerto Rico are subaerial topographical highs on the Puerto Rico Bank. During the Pleistocene low stand of sea level, a continuous subaerial landmass extended eastward from Puerto Rico across the British Virgin Islands. The Puerto Rico Bank is essentially the geomorphic expression of the Puerto Rico-Virgin Islands microplate located in the northeastern corner of the Caribbean tectonic plate between the Caribbean and North American plates. The microplate is geographically closely related to the Caribbean plate and is moving eastward with it. The Caribbean plate is bounded on the east and west by subduction zones and on the north and south by strike-slip faults.

The Caribbean plate began as an oceanic plateau of overthickened oceanic crust of Jurassic and Cretaceous age in the western Pacific Ocean, and it moved into the gap between North and South America formed by the opening of the North Atlantic Ocean about 170 million years ago *(6, 13, 20, 24, 25)*. The Caribbean plate entered the widening gap that would become the Atlantic Ocean basin about 75 million years ago and since then has been moving roughly eastward with respect to both North and South America *(15)*. In response to the relative eastward movement of the Caribbean plate, the west-dipping subduction of the North American plate under the Caribbean plate produced magmatism from Late Cretaceous through early Paleocene in the Aves Ridge volcanic complex and from Eocene to Recent in the Lesser Antilles volcanic arc *(25)*. The active Lesser Antilles arc now terminates at the island of Saba, about 160 kilometers southeast of St. John.

The Virgin Islands constitute the eastern extremity of the Greater Antilles, which are interpreted to have been an old, extinct magmatic arc that trended roughly east-west, was probably built on oceanic crust, and possibly once was continuous with the north-south Aves Ridge volcanic arc complex *(25)*. Subduction-related magmatism in the Greater Antilles arc began in the Early Cretaceous and continued until the Eocene. The early polarity of this arc is not known. After the Santonian or Campanian, the Greater Antilles arc was definitely north-facing (south-dipping subduction zone) in Cuba and Hispaniola *(25)*. At some time, probably Eocene, the Greater Antilles arc collided with the continental crust of the North American plate and subduction-related magmatism ceased. Subsequently with the initiation of the creation of oceanic crust at the north-south trending Cayman Trough spreading center, movement along the northern boundary of the Caribbean plate changed to left-lateral strike-slip motion, which continues today.

The only previous detailed geologic mapping of the northern United States Virgin Islands is by T.W. Donnelly *(9)*. The map, at a scale of 1:62,500, covers St. Thomas, St. John, and nearby cays. This report is based on new geologic mapping of St. Thomas and St. John and nearby cays at a scale of 1:24,000 *(26)*. The generalized geology map is included in the map section of the publication. The geology of St. Croix was not mapped in the present study.

Basalt, andesite, keratophyre, and their volcaniclastic equivalents make up most of the northern United States Virgin Islands. Calcareous rocks and chert are minor but important components. Stratified rocks, except the surficial deposits, are of latest Aptian or Albian to late Turonian or late Santonian (late Early Cretaceous to Late Cretaceous) age. Most of the section is marine. The stratified rocks are several kilometers thick. All pre-surficial stratified rocks are intruded by dikes and small plutons ranging in composition from gabbro to granite. Some of these are as young as late Eocene and have contact metamorphic aureoles along the northeastern shore of St. Thomas and in northern and eastern St. John. Surficial deposits include beach rock, bay mouth bars, playa deposits, alluvium, boulder fields, and artificial fill. Only the alluvium is likely to contain material as old as Pleistocene.

The oldest rocks exposed in the northern United States Virgin Islands are keratophyres, basalts, and volcaniclastic rocks derived from them, of the Water Island Formation (Kw) and their intrusive equivalents, the Careen Hill Intrusive Suite (Kc). For convenience, the collective assemblage is called the Lameshur Volcanic-Intrusive Complex. Keratophyre is a term applied to igneous rocks, either intrusive or extrusive, that have a microscopic or fine-grained groundmass, are siliceous (commonly more than 70 weight percent SiO_2) and are sodic instead of potassic. Globally, most siliceous igneous rocks are potassic instead of sodic.

Figure 4.—Flow layering in keratophyre of the Water Island Formation, Compass Point in Jersey Bay, St. Thomas. The hammer in the left center of the photograph is 28.5 centimeters long.

Keratophyre, which makes up about 80 percent of the Lameshur Volcanic-Intrusive Complex, occurs as lava flows (fig. 4), breccias, layered tuffs (fig. 5), dikes and small hypabyssal (crystallized at a shallow depth) intrusive bodies. Phenocrysts of quartz and/or plagioclase are conspicuous in some keratophyres. The more mafic rocks of the complex form amygdaloidal pillow lavas (fig. 6), pillow breccias (fig. 7), dikes, and small plutons. Dark-colored cherts containing fossil radiolaria are a minor but widespread and important constituent of the Water Island Formation. Radiolaria from a chert bed near the top of

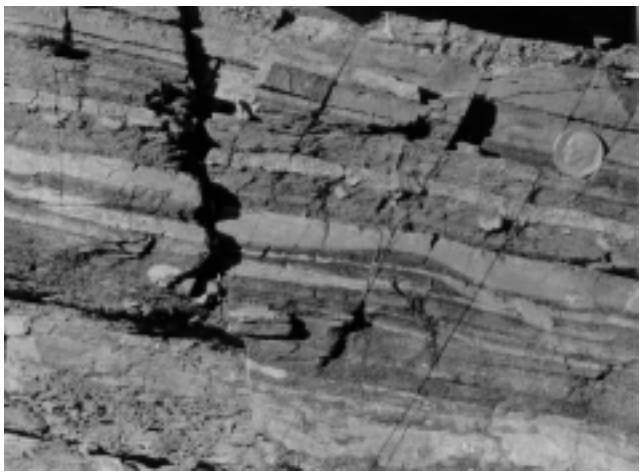


Figure 5.—Bedded volcanic sandstone and ash of the Water Island Formation, showing features resulting from slumping of soft sediments prior to lithification. The dime is for scale. This photograph was taken at the southwestern point of Great St. James Island.

Figure 6.—Pillow basalt, which is now metamorphosed to a greenschist mineral assemblage, of the Water Island Formation. The cores of many of the pillows are rich in secondary, yellowish-green epidote. The layering of the pillows, originally subhorizontal, now dips steeply from upper right to lower left, or about 75 degrees to the north-northeast. Asymmetry of the pillows indicates that the original up direction was to the left, or that the rocks are increasingly younger to the left. The hammer in the lower left center of the photograph is for scale. The photograph was taken at a prominent point in Coral Bay, west of Haul Over, St. John.

the formation have been dated as late Aptian or earliest Albian *(11)*.

The Water Island Formation crops out on Water Island (from which it takes its name), in southern St. Thomas, along the southwestern coast of St. John, and in central and eastern St. John. It is at least 2 kilometers thick but could well be twice that. The

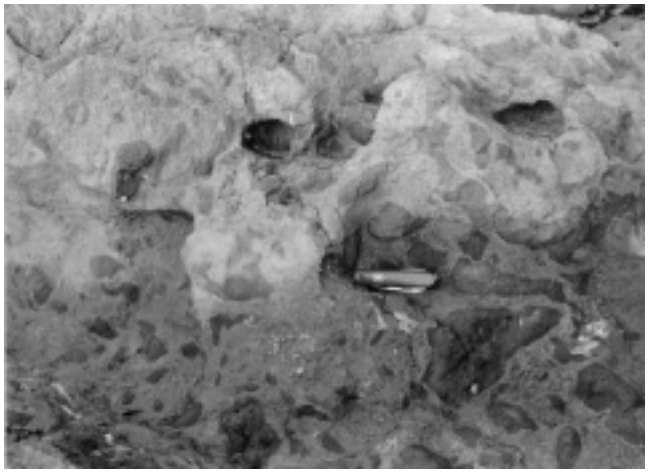


Figure 7.—Hyaloclastite and brecciated pillow basalt, Water Island Formation. The knife is 8.2 centimeters long. The photograph was taken at Nazareth Bay in southeastern St. Thomas.

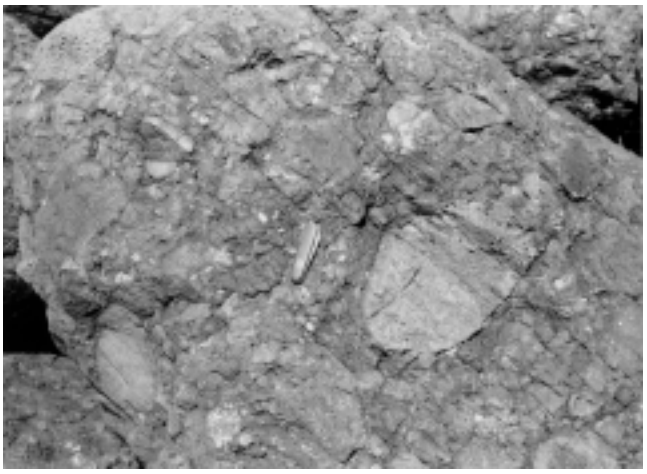


Figure 8.—Volcanic conglomerate of the Louisenhoj Formation. The photograph was taken in Stumpy Bay in western St. Thomas.

Careen Hill Intrusive Suite consists of dikes and small plutons intrusive into the Water Island Formation and makes up all of Leduck and Flanagan Islands. Sharp hills around the harbor of Charlotte Amalie, on the southwestern coast of St. John, and Ram Hill are held up by some of the small plutons. All rocks of the Lameshur exhibit local intense deuteric hydrothermal alternation, which may include silicification, oxidation, and sulfidization. This alteration has produced the brightly colored rocks visible at such places as Lindbergh Bay and Red Hook on St. Thomas and Maria Bluff and White Cliffs on St. John. The development of box-work textures such as on Cas Cay and relict gossan on Bordeaux Mountain, St. John, are more recent weathering products of the hydrothermally altered rocks.

Extrusive rocks of the Water Island Formation were erupted in a submarine environment as indicated by the pillow basalts and radiolarian cherts. Chemically, they have an oceanic affinity, and the abundant dikes, some of which are sheeted (many closely spaced subparallel dikes), suggest an extensional environment. The Lameshur Volcanic-Intrusive Complex thus may relate to the early stages of the formation of the Caribbean plate in the western Pacific. The sheeted dikes here are unusual in that they are mostly keratophyre as opposed to diabase. The abundance of siliceous rocks in the Lameshur is problematic for an oceanic environment; perhaps the rocks formed in a back-arc basin.

The Louisenhoj Formation (Kl) conformably overlies the Water Island Formation and consists of strongly cemented volcanic conglomerate (fig. 8), breccia, volcanic sandstone, shale, chert, andesite, basalt, tuff, and rare limestone. Nearly all of the detritus in the clastic units are volcanic rocks, and most of those are andesite and basalt characterized by clinopyroxene and stubby plagioclase phenocrysts. Other rocks found as clasts include devitrified andesitic glass, pumice (not common), limestone, and keratophyre. Differences in clast populations suggest several local sources for the detritus. Primary volcanic units (lava and flow breccia) are sparingly present and on Ramgoat Cay and at Kastel Point, St. Thomas, are pillowed. Massive conglomerate and breccia consisting of large boulders and slabs of andesite or basalt, however, cannot be far from primary volcanic rocks. The Louisenhoj Formation is dominated by thick conglomerate beds, typically interlayered with sequences a few to several meters thick of sand- to silt-sized material and with laminated radiolarian chert. Graded beds (fig. 9) are common, and some are as thick as 4 to 6 meters. Clasts as large as 0.5 meters across are common throughout the formation.

Figure 9.—Thick, graded beds of boulder conglomerate and sandstone of the Louisenhoj Formation. The beds strike northeast and dip 15 degrees to the northwest. They are right-side-up. The photograph was taken on the eastern side of the south point of Salt Cay, west of St. Thomas.

Figure 10.—A slab of laminated sandstone and shale incorporated in massive grit and pebble conglomerate of the Picara Member of the Tutu Formation. The slab is part of a finer grained unit of the Picara Member that was broken and deformed by gravity sliding while the sediments were still plastic and was then incorporated in the grit. A minor post-lithification brittle fault offsets the slab and the enclosing grit. The photograph was taken at Picara Point, St. Thomas.

The Louisenhoj Formation crops outs in a broad belt from Savana Island across central St. Thomas to northwestern St. John and also underlies Hans Lollik Island. It is as thick as 2 kilometers on St. Thomas but thins to perhaps 0.5 kilometer at Leinster Bay, St. John. The age of the Louisenhoj Formation cannot be controlled more closely than Albian to Santonian (late Early to Late Cretaceous). The compositions of the volcanic rocks have island arc affinities. The coarser clastic units probably originated as debris flows on relatively steep slopes. Final emplacement was in a submarine environment, as indicated by the common grading of even the coarsest material. Local submarine pyroclastic flows are indicated by the abundance of pumiceous clasts. Calcite cement is increasingly common in the upper part of the formation and rare fossiliferous limestone beds are present.

A brief interval of volcanic quiescence followed in the Turonian to late Santonian (Late Cretaceous) (Ko) *(23)* with deposition of the Outer Brass Limestone, which includes clean calcite limestone (now marble), calc-silicate rocks, and conglomerate with calcareous cement and clasts of marble and/or andesite. The Outer Brass Limestone is 100 to 200 meters thick and crops out in a discontinuous belt broken by faults from Outer Brass Island across northeastern St. Thomas and reappears in northern St. John, between Maho Bay and Waterlemon Bay. On St. John, the outcrop belt is within the contact metamorphic aureole of the Tertiary plutons. The metamorphosed calc-silicate rocks include, in various mineral assemblages, calcite, plagioclase, epidote, brown isotropic garnet, diopside, vesuvianite, and wollastonite. The Outer Brass is interpreted to conformably overlie the Louisenhoj Formation, but a ductile fault forms the lower contact east of Magens Bay on St. Thomas. Elsewhere, the contact is not exposed.

Volcanism resumed in the Late Cretaceous, as indicated by the deposition of volcaniclastic turbidites and rare pyroxene basalt to andesite lava flows in the conformably overlying Tutu Formation. The volcanic source was farther away than in Louisenhoj time; boulder conglomerates are less common than in the Louisenhoj Formation but are prominent on Picara Point, St. Thomas. Silt to sand sized material dominates. There is an overall fining upward from the basal Picara Member (Ktp) (fig. 10) to the overlying Mandal Member (Ktm) (fig. 11), which contains

Figure 11.—Steeply dipping beds of metamorphosed sandstone and shale of the Mandal Member of the Tutu Formation. The beds dip 75 degrees to the north-northwest. Relief in the photograph is about 25 meters. The photograph was taken on the north side of the western end of Grass Cay.

considerable pelite. Carbonate cement is typical, and limestone beds and limestone conglomerate are locally prominent. One such unit, the Congo Cay Limestone lens of the Madal Member, is near the top of the stratigraphic section in the northern United States Virgin Islands. Soft sediment deformation, including some striking slump folds on Thatch Cay, suggest deposition on an unstable slope, perhaps the wall of an oceanic trench.

The outcrop belt of the Tutu Formation extends from Outer Brass Island along the north shore of St. Thomas from Picara Point to Coki Point. It forms the chain of islands that bound Pillsbury Sound on the north, and it crops out from Whistling Cay to Leinster Point, St. John. From Thatch Cay to Leinster Point, the Tutu Formation is within the contact metamorphic aureole of Tertiary plutons. Metamorphic recrystallization is most noticeable in the calcareous rocks. Limestones are marbles; calcareous siltstones and sandstones contain garnet and diopside and, in places, phlogopite, distinctly pleochroic amphibole, and wollastonite. Noncalcareous metasandstones contain biotite and cordierite.

Volcanism from Louisenhoj through Tutu time is interpreted to be island arc volcanism, part of the Greater Antilles arc volcanism. No direct evidence for the polarity of this arc is known from the northern United States Virgin Islands. The Tutu Formation is the youngest stratified unit in the northern United States Virgin Islands. Volcanism continued in the British Virgin Islands into the middle Eocene *(16).*

Dikes of diabase, gabbro, and diorite are abundant and intrude all stratified rocks except the surficial deposits. They range in thickness from a few centimeters to several tens of meters. Chilled margins are typical. The dikes are most obvious in coastal exposures, where dike complexes may occupy as much as 20 percent of some outcrops. They are near vertical and mostly trend northeast with a subset that trends northwest. The dikes are almost certainly of more than one age, but most of them are interpreted to be related to a dike swarm in Puerto Rico that is bracketed in age between the Paleocene and Oligocene *(10)*.

Small plutons (Ti), ranging in composition from gabbro to granite (mostly tonalite or diorite), intrude all stratified rocks except the surficial deposits. They form the isolated islands of Frenchcap and Capella south of St. Thomas. As with the dikes, the plutons may not all be the same age. The rocks on the Capella Islands are cut by numerous diabase dikes that may belong to the dike swarm described above. The tonalite bodies along the north shore of St. John, intrude diabase dikes, contain xenoliths of the dikes, and are younger than deformation that affects the dikes. These tonalite bodies are probably continuous under The Narrows with similar plutonic rocks on Great Thatch Island and Tortola. This larger, mostly submarine body, called The Narrows pluton, is probably responsible for the contact metamorphism in the Pillsbury Sound islands and northern St. John. The Narrows pluton and the large Virgin Gorda batholith to the north and east in the British Virgin Islands represent late-stage arc magmatism of the Greater Antilles arc. The Virgin Gorda batholith intrudes middle Eocene rocks on Tortola *(16)*. The Narrows pluton at Please, St. John, is about 39 million years old or late Eocene, based on an $^{40}Ar/^{39}Ar$ plateau age on hornblende *(26)*.

Dikes and small hypabyssal intrusions of poprphyritic tonalite, the Red Hook Tonalite Porphyry (Tr), cut all bedrock stratified units as well as the tonalite of the Capella Islands. Some bodies are intruded along faults. The Red Hook is probably the youngest nonsurficial unit in the northern United States Virgin Islands. The Red Hook is characterized by bipyramidal quartz phenocrysts that are commonly 1 centimeter but can be as much as 3 centimeters across and barrel-shaped biotite phenocrysts, which are commonly pseudomorphed by vermiculite.

With the exception of Hans Lollik Island and its neighbors to the north, the rock units of the northern United States Virgin Islands form a generally north-dipping homoclinal sequence, crinkled by folds of various degrees of intensity, whose axes generally trend roughly parallel to the strike of local segments of the homocline, complicated by long wavelength and low amplitude cross-folds and younger faults. Numerous observations of topping directions confirm that the units are younger to the north. A few outcrop- or map-scale open folds with generally east-west axes, mostly in the Louisenhoj Formation, were observed or deduced from reversals of bedding attitudes. Most of these fold axes plunge gently east or west. Map-scale folds in the Louisenhoj Formation are deduced from bedding attitudes observed on the islands west of St. Thomas from Cricket Rock to Salt Cay, on Inner Brass Island and Dorothea Point, and on the slopes north of Charlotte Amalie. The folds become tighter to the north and have a penetrative axial plane cleavage that typically dips more steeply (most commonly to the north) than the bedding. The asymmetry of the tight folds and of boudins mostly indicate a shear sense of north-side-up. The north-south compression that produced these folds is thought to be related to the initial collision between the Greater Antilles arc of the Caribbean plate and Bahama platform of the North American plate *(25)*. This compression probably followed the major pulse of diabase dike intrusion. A

synclinal axis north of St. Thomas and St. John accounts for the roughly north-dipping homoclinal sequence from the Water Island to Tutu Formations on those islands. Volcaniclastic conglomerate of the Louisenhoj Formation reappears on the north limb of this syncline on Hans Lollik, Little Hans Lollik, and Pelican Cay. The intensity of the deformation caused by north-south compression decreases to the north on Little Hans Lollik and Pelican Cay and across Tortola *(16)*.

Structures resulting from the north-south compression are warped by long wavelength, low amplitude folds whose axes plunge gently north. The wavelength of these folds ranges from a few to many kilometers. One of the larger folds causes the broad arc concave to the north of the outcrop belt of the Tutu Formation from Picara Point, St. Thomas, to Mary Point, St. John. Bedding attitudes in the Water Island and Louisenhoj Formations show that a broad, north-plunging syncline-anticline pair, disrupted by later faulting, occupies most of St. John *(26)*. Stratigraphic layering, including bedding, pillow layering in basalt, and flow layering of keratophyre lava, from the Lameshur Bays across Bordeaux Mountain to the East End of St. John dips northeastward, roughly at right angles to the layering shown by Donnelly *(9)*.

The two generations of folds are cut by numerous near-vertical brittle faults. A series of strike-slip faults with left-lateral offset define a northeast-trending structural block extending from small islands off southeastern St. Thomas across central St. John. The northwest-bounding fault is called the Great St. James fault and the southwest-bounding fault is called the Brown Bay fault. Between the bounding faults of this structural block, the stratigraphic contact between the Water Island and Louisenhoj Formations is left-laterally offset about 5.7 kilometers on a series of right-stepping en echelon strike-slip faults. The amount of strike-slip movement on the Great St. James fault decreases to the northeast across St. John, and the amount of movement of the Brown Bay fault increases northeastward across St. John. The block within the zone of overlap between these two bounding faults was under compression and was uplifted on at least two high-angle reverse faults that trend to the northwest and dip steeply to the northeast. The Water Island-Louisenhoj contact is brought up about 2.7 kilometers on one of these high-angle reverse faults within this block in the zone of overlap. The amount of uplift on the second high-angle fault cannot be determined. The structure is rhomb horst.

The left-lateral strike-slip faults are interpreted to be younger than The Narrows pluton, which has been dated at 39 million years of age, or late Eocene. A major episode of left-lateral strike-slip faulting, with a different orientation, occurred in Puerto Rico in the late Eocene to early Oligocene *(19)*. The left-lateral strike-slip faulting in Puerto Rico and the northern United States Virgin Islands is interpreted to be strike-slip accommodation near the northern border of the Caribbean plate in the early stages of the Cayman trough spreading and the transition from an east-west trending arc (Greater Antilles arc) to an east-facing arc above a west-dipping subduction zone (the still active Lesser Antilles arc).

The northeast-trending Red Hook fault may be even younger. The relative offset of the Water Island-Louisenhoj stratigraphic contact is right-lateral rather than left-lateral. The relative offset could also be explained by dip-slip movement with the southeast side downdropped *(8)*.

Unlike other parts of the Greater Antilles, there is no evidence for recent tectonic movement. There are no uplifted beaches, no uplifted wave-cut platforms, and no fault scarps. Hypocenters of shallow earthquakes (depth less than 50 kilometers) are mostly associated with the Puerto Rico Trench and the north wall of the Virgin Island Basin *(14)*. The sea level appears to have been at roughly the same level since the Pleistocene. Most bays are blocked by bay-mouth bars consisting of modern reef debris that entraps a salt pond landward. Much of the cliffy shoreline of Congo Cay is undercut by a wave-cut notch at sea level.

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 National Soil Survey Handbook *(30)* provides guidelines for the preparation, management, and publication of this soil survey.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on planimetrically-corrected topo quads and identified each as a specific map unit. Soil lines were transferred to mylar for scanning prior to digitizing to a GIS format. Digitized soil lines were then applied to aerial photographs of the survey area. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

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

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

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

1. Annaberg-Cramer-Southgate

Shallow, well drained, steep to very steep soils on summits and side slopes of volcanic hills and mountains

Location

This map unit is located on St. Croix and St. Thomas. It is not mapped on St. John.

On St. Croix, this map unit extends from Butler Bay and Maroon Hole east to Mt. Eagle and southwest to Wheel of Fortune. On St. Thomas, the unit dominates the south shore mountains from Cyril E. King Airport to Redhook Hill and includes Hassel and Water Islands.

All of the small islands and cays to the south of St. Thomas and St. John Islands are included in this unit. The small islands from Thatch Cay to Lovango Cay are also included. Cockroach Island, Dutchcap Cay, Savana Island, and Salt and West Cays are also part of this map unit.

Setting

This map unit consists of rugged hills and mountains that are dissected by very narrow valleys that have a dendritic drainage pattern.

Composition

Percent of the survey area: 17.1 percent
Annaberg soils—43.0 percent
Cramer soils—14.9 percent
Southgate soils—9.8 percent
Minor inclusions—32.3 percent

Soil Characteristics

Annaberg soils

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Cramer soils

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Southgate soils

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Minor Inclusions

- Maho Bay soils
- Victory soils
- Rock outcrop

Figure 12.—A view of general soil map unit Southgate-Victory-Cramer from Maria Bluff, across Devers Bay on St. John Island.

Use and Management

Major uses: Rangeland
Management concerns: Slope, shallow depth, stones on the surface

2. Southgate-Victory-Cramer

Shallow, moderately deep and shallow, well drained, steep to very steep soils on summits and side slopes of volcanic hills and mountains

Location

This map unit is located on St. Croix and St. John. It is not mapped on St. Thomas.

On St. Croix, the unit extends east from Mt. Eagle to Salt River Bay southwest to Upper Love and northwest of Fountain. It also extends from Orange Grove just west of Christiansted south to Catherines Rest and Fareham Bay and east to East Point. Included in this unit are Green Cay, Protestant Cay, and Buck Island.

This unit is in the eastern part of St. John. It extends from Watermelon Bay southwest to Mamey Peak and from Great Cruz Bay east to Bordeaux Mountain (fig. 12).

Setting

This map unit consists of rugged hills and mountains that are dissected by very narrow valleys that have a dendritic drainage pattern.

Composition

Percent of the survey area: 27.1 percent
Southgate soils—31.6 percent
Victory soils—27.1 percent

Cramer soils—7.7 percent
Minor inclusions—33.6 percent

Soil Characteristics

Southgate soils

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Victory soils

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Cramer soils

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Minor Inclusions

- Annaberg soils
- Jealousy soils
- Rock outcrop

Use and Management

Major uses: Rangeland
Management concerns: Slope, shallow depth, stones

3. Fredriksdal-Susannaberg-Dorothea

Shallow and very deep, well drained, steep to very steep soils on summits and side slopes of volcanic hills and mountains

Location

This map unit is located on St. Thomas and St. John. It is not mapped on St. Croix.

On St. Thomas Island, this unit extends the entire length of the island from Botany Point to Cabres Point north of Red Hook. Also included in this unit are Outer Brass, Inner Brass, Little Hans Lollik, and Hans Lollik Islands north of St. Thomas.

This unit dominates the western half of St. John. It extends from Cruz Bay south to Dittlif Point to East Mary Point.

Setting

This map unit consists of rugged hills and mountains that are dissected by very narrow valleys that have a dendritic drainage pattern.

Composition

Percent of the survey area: 22.8 percent
Fredriksdal soils—30.4 percent
Susannaberg soils—19.3 percent
Dorothea soils—17.7 percent
Minor inclusions—32.6 percent

Soil Characteristics

Fredriksdal soils

Surface layer:
0 to 7 inches, dark reddish brown very gravelly clay loam

Subsoil:
7 to 12 inches, reddish brown very gravelly clay loam

Bedrock:
12 to 16 inches, weathered igneous bedrock
16 to 60 inches, unweathered igneous bedrock

Susannaberg soils

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Dorothea soils

Surface layer:
0 to 6 inches, dark brown clay loam

Subsoil:
6 to 11 inches, brown clay loam
11 to 19 inches, yellowish brown clay
19 to 30 inches, strong brown clay loam

Substratum:
30 to 60 inches, strong brown saprolite

Minor Inclusions

- Annaberg soils
- Maho Bay soils

Use and Management

Major uses: Rangeland
Management concerns: Slope, shallow depth, percs slowly

4. Hesselberg-Sion-Arawak

Shallow, very deep, and shallow, well drained, nearly level to strongly sloping soils on ancient marine terraces and valleys of limestone hills and mountains

Location

This map unit is located on St. Croix. It is not mapped on St. Thomas or St. John.

On St. Croix, this map unit separates the western and eastern mountain ranges. It extends from Frederiksted on the west side of the island south to Sandy Point and east to Hope and Carlton Land. It is roughly triangular in shape. In the central part of the island, it extends from Enfield Green northeast to Concordia and then southwest to Fredensborg and southeast to Cape Garden (fig. 13).

Setting

This map unit consists of terraces and uplands on the coastal plain of St. Croix.

Composition

Percent of the survey area: 10.1 percent
Hesselberg soils—40.8 percent
Sion soils—18.7 percent
Arawak soils—13.6 percent
Minor inclusions—26.9 percent

Soil Characteristics

Hesselberg soils

Surface layer:
0 to 7 inches, dark reddish brown clay

Subsurface layer:
7 to 12 inches, dark reddish brown clay

Subsoil:
12 to 17 inches, dark red gravelly clay
17 to 18 inches, reddish yellow, pinkish white, and very pale brown, partially silicified marl
18 to 24 inches, white, partially silicified marl

Substratum:
24 to 60 inches, very pale brown gravelly sandy loam

Sion soils

Surface layer:
0 to 6 inches, very dark grayish brown clay

Subsurface layer:
6 to 12 inches, dark brown clay

Subsoil:
12 to 16 inches, brown gravelly clay

Substratum:
16 to 24 inches, pinkish white very gravelly sandy clay loam
24 to 32 inches, pinkish white gravelly sandy loam
32 to 60 inches, pinkish white loam

Arawak soils

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Minor inclusions

- Glynn soils

Use and Management

Major uses: Rangeland and a few areas of pasture, hayland, and cropland
Management concerns: Slope, shallow depth, stones

Figure 13.—The Hesselberg-Sion-Arawak general soil map unit is in the foreground, and the Arawak association is represented by the hills in the background.

5. Arawak Association

Shallow, well drained, steep to very steep soils on summits and side slopes of limestone hills

Location

This map unit is located on St. Croix. It is not mapped on St. Thomas or St. John.

On St. Croix, this map unit is in the limestone hilly region in the central part of the island, north of Diamond and south of Salt River Bay.

Setting

This map unit consists of limestone hills that are dissected by narrow valleys.

Composition

Percent of the survey area: 5.1 percent
Arawak soils—82.2 percent
Minor inclusions—17.8 percent

Soil Characteristics

Arawak soils

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Minor Inclusions

- Glynn soils

Use and Management

Major uses: Rangeland
Management concerns: Slope, shallow depth, stones

6. Glynn-Hogensborg

Very deep, well drained, nearly level to moderately steep soils on alluvial fans and terraces

Location

This map unit is located on St. Croix. It is not mapped on St. Thomas or St. John.

On St. Croix, the main mapped areas of this unit consist of fans that spread toward the sea over coastal plain sediments. Included in this unit are areas from William to La Grange; from Long Point Bay northeast to Concordia, Mon Bijou, Holy Cross, Williams Delight, and Carlton; from Catherine's Rest south to Manchenil Bay; around Southgate Pond; and from Sally's Fancy to Great Pond on the southeast side of the island.

Setting

This unit consists of coastal plain alluvium and is along drainageways adjacent to volcanic uplands.

Composition

Percent of the survey area: 12.4
Glynn soils—59.6 percent
Hogensborg soils—12.2 percent
Minor inclusions—28.2 percent

Soil Characteristics

Glynn soils

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly c lay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Hogensborg soils

Surface layer:
0 to 6 inches, very dark grayish brown clay loam

Subsurface layer:
6 to 13 inches, dark grayish brown clay loam

Subsoil:
13 to 62 inches, light olive brown clay

Substratum:
62 to 76 inches, strong brown gravelly clay loam
76 to 88 inches, strong brown clay loam

Minor Inclusions

- Arawak soils
- Carib soils
- Sion soils
- Solitude soils

Use and Management

Major uses: Rangeland and a few areas of pasture, hayland, and cropland
Management concerns: Flooding, ponding, percs slowly

7. Urban Land-Ustorthents-Glynn

Shallow to very deep; well drained; nearly level to steep; disturbed, manmade, or impervious surface areas of land

Location

This map unit is located on St. Croix and St. Thomas. No significant areas of this map unit are on St. John.

On St. Croix, this unit includes the Hess Refinery complex and the Alexander Hamilton Airport.

On St. Thomas, this map unit extends along the southern coast from Cyril E. King Airport to Redhook Bay.

Setting

This map unit consists of urban and industrial areas.

Composition

Percent of the survey area: 4.8 percent
Urban land—48.1 percent
Ustorthents—22.5 percent
Glynn soils—7.5 percent
Minor inclusions—21.9 percent

Characteristics of Map Unit Components

Urban land

This component consists of areas that are covered by more than 70 percent impervious surfaces. The slopes are mainly 0 to 20 percent, but they range from 0 to 60 percent. Included in this map unit are small areas of lawns, parks, vacant lots, and playgrounds that contain unaltered soils.

Ustorthents

This component consists of areas that have been altered from their natural state by human activities. They are generally associated with cutting and filling activities of urban development. Included in this component are disposal areas for quarry, refinery, and landfill operations.

Glynn soils

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly clay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Minor Inclusions

- Aquents

Use and Management

Major uses: Urban and industrial development
Management concerns: Flooding, hazard of erosion, water quality, waste management

Detailed Soil Map Units

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

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

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

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

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

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

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

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Annaberg-Cramer complex, 12 to 20 percent slopes, extremely stony, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded, is an undifferentiated group in this survey area.

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

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

AcD—Annaberg-Cramer complex, 12 to 20 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 60 percent
Cramer and similar soils: 20 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Jealousy—moderately deep soils that have a fine-textured subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils
- Victory—moderately deep soils that have a lighter-colored surface layer

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of

rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is poorly suited to pasture and hay. Management concerns include the slope, the low and very low available water capacity, the shallow rooting depth, and the extremely stony surface. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. It is generally not suitable as a site for buildings because of the slope and the depth to bedrock. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or using fill material helps to overcome the depth to bedrock. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, the droughtiness of the soils, and the depth to water are management concerns.

This map unit is in capability subclass VIs.

AcE—Annaberg-Cramer complex, 20 to 40 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 60 percent
Cramer and similar soils: 20 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Jealousy—moderately deep soils that have a fine-textured subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils
- Victory—moderately deep soils that have a lighter-colored surface layer

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep

Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not needed and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, the droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

AcF—Annaberg-Cramer complex, 40 to 60 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 60 percent
Cramer and similar soils: 20 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Jealousy—moderately deep soils that have a fine-textured subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils
- Victory—moderately deep soils that have a lighter-colored surface layer

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate

Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

AcG—Annaberg-Cramer complex, 60 to 90 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 60 percent
Cramer and similar soils: 20 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Jealousy—moderately deep soils that have a fine-textured subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils
- Victory—moderately deep soils that have a lighter-colored surface layer

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate

Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Cramer

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

AmD—Annaberg-Maho Bay complex, 12 to 20 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 50 percent
Maho Bay and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Fredriksdal—soils that have a clayey subsoil
- Jealousy—moderately deep soils that have a clayey subsoil
- Susannaberg—soils that have a clayey subsoil
- Victory—moderately deep soils

Similar inclusions

- Soils that have a rubbly surface layer
- Soils that do not have gravel in the surface layer
- Soils on slopes of less than 12 percent

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Maho Bay

Surface layer:
0 to 7 inches, very dark brown gravelly loam

Subsoil:
7 to 11 inches, dark brown gravelly loam

Bedrock:
11 to 22 inches, saprolite
22 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate

Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Maho Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 8 to 20 inches
Root zone: 8 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, and the extremely stony surface are severe limitations.

This map unit is poorly suited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, and the extremely stony surface are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope and the depth to bedrock are management concerns for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

AmE—Annaberg-Maho Bay complex, 20 to 40 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 50 percent
Maho Bay and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Fredriksdal—soils that have a clayey subsoil
- Jealousy—moderately deep soils that have a clayey subsoil
- Susannaberg—soils that have a clayey subsoil
- Victory—moderately deep soils

Similar inclusions

- Soils that have a rubbly surface layer
- Soils do not have gravel in the surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Maho Bay

Surface layer:
0 to 7 inches, very dark brown gravelly loam

Subsoil:
7 to 11 inches, dark brown gravelly loam

Bedrock:
11 to 22 inches, saprolite
22 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Maho Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 8 to 20 inches
Root zone: 8 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and depth to bedrock are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

AmF—Annaberg-Maho Bay complex, 40 to 60 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 50 percent
Maho Bay and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Fredriksdal—soils that have a clayey subsoil
- Jealousy—moderately deep soils that have a clayey subsoil
- Susannaberg—soils that have a clayey subsoil
- Victory—moderately deep soils

Similar inclusions

- Soils that have a rubbly surface layer
- Soils that do not have gravel in the surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Maho Bay

Surface layer:
0 to 7 inches, very dark brown gravelly loam

Subsoil:
7 to 11 inches, dark brown gravelly loam

Bedrock:
11 to 22 inches, saprolite
22 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Maho Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 8 to 20 inches
Root zone: 8 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

AmG—Annaberg-Maho Bay complex, 60 to 90 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Annaberg and similar soils: 50 percent
Maho Bay and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Fredriksdal—soils that have a clayey subsoil
- Jealousy—moderately deep soils that have a clayey subsoil
- Susannaberg—soils that have a clayey subsoil
- Victory—moderately deep soils

Similar inclusions

- Soils that have a rubbly surface layer
- Soils that do not have a gravelly surface layer

Typical Profile

Annaberg

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown very gravelly loam

Bedrock:
10 to 13 inches, weathered igneous bedrock
13 to 60 inches, unweathered igneous bedrock

Maho Bay

Surface layer:
0 to 7 inches, very dark brown gravelly loam

Subsoil:
7 to 11 inches, dark brown gravelly loam

Bedrock:
11 to 22 inches, saprolite
22 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Annaberg

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Maho Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 8 to 20 inches
Root zone: 8 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations (fig. 14).

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

AqA—Aquents, 0 to 2 percent slopes, ponded

This map unit consists of areas of soils in saline flats, saline marshes, salt ponds, and refinery spoil retention ponds. The areas are prone to ponding and flooding resulting from gut flow, marine tides, and marine storm surges. The soils are poorly and very poorly drained, very deep, and strongly saline. They are frequently ponded for very long periods. Many areas of this map unit are unvegetated. Onsite investigation is needed to determine the suitability or potential of the map unit for any use. Because of the variability in areas of these soils, a typical profile is not provided.

The capability subclass is VIIIw.

ArB—Arawak gravelly loam, 2 to 5 percent slopes, very stony

Setting

Landform position: On toe slopes of hills and mountains underlain by limestone
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Arawak and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a clayey subsoil
- Sion—very deep soils

Figure 14.—An area of Annaberg-Maho Bay coplex, 60 to 90 percent slopes, extremely stony, in the Virgin Islands National Park, St. John Island.

Similar inclusions

- Soils that do not have a gravelly or stony surface layer
- Soils that have soft marl in the subsoil and substratum

Typical Profile

Arawak

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Soil Properties and Qualities

Arawak

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Moderate

Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is fairly suited for cultivated crops. The moderate hazard of erosion, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, and the very stony surface are management concerns.

This map unit is fairly suited to pasture and hay. The very low available water capacity, the shallow rooting depth, and the very stony surface are management concerns. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to urban uses. The depth to bedrock is a management concern for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and slow percolation rate are management concerns for septic tank absorption fields. It also is a limitation for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The depth to bedrock and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIs.

ArC—Arawak gravelly loam, 5 to 12 percent slopes, very stony

Setting

Landform position: On toe slopes of hills and mountains that are underlain by limestone
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Arawak and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a clayey subsoil
- Sion—very deep soils

Similar inclusions

- Soils that do not have a gravelly or stony surface layer
- Soils that have soft marl in the subsoil and substratum

Typical Profile

Arawak

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Soil Properties and Qualities

Arawak

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, and the very low available water capacity are management concerns.

This map unit is poorly suited to pasture and hay. The slope, the very low available water capacity, and shallow rooting depth are management concerns. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited for urban uses. The depth to bedrock and the slope are management concerns for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock, the slow percolation rate, the slope, and large stones are severe limitations for septic tank absorption fields. The depth to bedrock and the slope are severe limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIs.

ArD—Arawak gravelly loam, 12 to 20 percent slopes, very stony

Setting

Landform position: On summits and side slopes of hills and mountains that are underlain by limestone
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Arawak and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a clayey subsoil
- Sion—very deep soils

Similar inclusions

- Soils that do not have a gravelly or stony surface layer
- Soils that have soft marl in the subsoil and substratum

Typical Profile

Arawak

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Soil Properties and Qualities

Arawak

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very

stony surface, and the very low available water capacity are severe limitations.

This map unit is poorly suited to pasture and hay. The slope, the very low available water capacity, the very stony surface, and shallow rooting depth are management concerns. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The depth to bedrock and the slope are management concerns for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the slope are severe limitations for septic tank absorption fields. The depth to bedrock and the slope are also management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIs.

ArE—Arawak gravelly loam, 20 to 40 percent slopes, very stony

Setting

Landform position: On summits and side slopes of hills and mountains that are underlain by limestone
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Arawak and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a clayey subsoil
- Sion—very deep soils

Similar inclusions

- Soils that do not have a gravelly or stony surface layer
- Soils that have soft marl in the subsoil and substratum

Typical Profile

Arawak

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Soil Properties and Qualities

Arawak

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very stony surface, and the very low available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the very stony surface, and the shallow rooting depth are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The depth to bedrock and the slope are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the slope are severe limitations for septic tank absorption fields. The depth to bedrock and the slope are also management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

ArF—Arawak gravelly loam, 40 to 70 percent slopes, very stony

Setting

Landform position: On summits and side slopes of hills and mountains that are underlain by limestone
Shape of areas: Irregular
Size of areas: 3 to 600 acres

Composition

Arawak and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a clayey subsoil
- Sion—very deep soils

Similar inclusions

- Soils that do not have a gravelly or stony surface layer
- Soils that have soft marl in the subsoil and substratum

Typical Profile

Arawak

Surface layer:
0 to 6 inches, very dark grayish brown gravelly loam

Subsurface layer:
6 to 11 inches, very dark grayish brown very gravelly loam

Substratum:
11 to 14 inches, pale brown very gravelly loam

Bedrock:
14 to 60 inches, pale brown and pinkish white limestone

Soil Properties and Qualities

Arawak

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very stony surface, and the very low available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the very stony surface, and the shallow rooting depth are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited for urban uses. The depth to bedrock and the slope are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to wildlife habitat. The

depth to bedrock, the shallow rooting depth, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

BrB—Beaches, rock outcrop

This map unit consists of unvegetated areas of limestone rock beaches that are adjacent to the sea. Slopes range from 0 to 5 percent. Areas of this map unit are prone to flooding resulting from rain, marine tides, and marine storm surges. They are subject to frequent ponding for very long periods. An onsite investigation is needed to determine the suitability or potential of this map unit for any use.

This map unit is in capability subclass VIIIw.

BsB—Beaches, sandy

This map unit consists of unvegetated areas of alkaline sand beaches that are adjacent to the sea. Slopes range from 0 to 5 percent. The soils are very deep, excessively drained, and moderately to strongly saline. They are prone to occasional flooding for brief periods by marine tides or storm surges. Onsite investigation is needed to determine the suitability or potential of the map unit for any use.

This map unit is in capability subclass VIIIw.

BtB—Beaches, stony

This map unit consists of unvegetated, stone-covered areas of alkaline sand beaches that are adjacent to the sea. The soils are very deep, excessively drained, and moderately to strongly saline. They are prone to occasional flooding for brief periods by marine tides or storm surges. An onsite investigation is needed to determine the suitability or potential of the map unit for any use.

This map unit is in capability subclass VIIIw.

CaA—Carib clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform position: Flood plains that are adjacent to volcanic and limestone uplands
Shape of areas: Irregular
Size of areas: 5 to 50 acres

Composition

Carib and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—well drained soils
- Sandy Point—very poorly drained soils
- Sion—well drained soils that have a coarse-loamy subsoil
- Solitude—soils that have a lighter colored surface layer

Similar inclusions

- Soils that have a stony or very stony surface layer

Typical Profile

Carib

Surface layer:
0 to 8 inches, very dark grayish brown clay loam

Subsoil:
8 to 21 inches, very dark grayish brown clay loam
21 to 32 inches, dark grayish brown clay loam
32 to 45 inches, grayish brown sandy clay loam
45 to 52 inches, dark grayish brown clay loam

Substratum:
52 to 60 inches, grayish brown clay loam

Soil Properties and Qualities

Carib

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Available water capacity: Medium
Organic matter content: High
Natural fertility: Moderate
Hazard of erosion: Slight
Seasonal high water table: Apparent, at a depth of 1.5 to 3.0 feet from April to December
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline in the upper part, very slightly saline in the lower part
Flooding: Frequent for brief periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited to cultivated crops.

Frequent flooding and wetness are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is fairly suited to pasture and hay. Frequent flooding and wetness are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited for urban uses. The flooding and wetness are severe limitations.

This map unit is unsuited for recreational uses. The flooding and wetness are severe limitations.

This map unit is suited to use as wildlife habitat. Wetness and flooding are management concerns. Areas of the Carib soil are suited as wetland wildlife habitat. Management concerns include the depth to the water table. Saline wetland plants are poorly suited to areas of the Carib soil. The low content of salt and sodium is a severe limitation for the establishment of saline plant communities in areas of this map unit.

This map unit is in capability subclass IIIw.

CbB—Cinnamon Bay loam, 0 to 5 percent slopes, occasionally flooded

Setting

Landform position: On alluvial fans and terraces adjacent to volcanic uplands
Shape of areas: Irregular
Size of areas: 3 to 200 acres

Composition

Cinnamon Bay and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Carib—somewhat poorly drained soils
- Glynn—soils that have a clayey-skeletal subsoil
- Sandy Point—very poorly drained soils
- Solitude—somewhat poorly drained soils

Similar inclusions

- Soils that have a gravelly or very gravelly surface layer
- Soils that have a stony or rubbly surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Cinnamon Bay

Surface layer:
0 to 3 inches, very dark grayish brown loam

Subsurface layer:
3 to 11 inches, dark brown loam

Subsoil:
11 to 21 inches, dark yellowish brown clay loam

Substratum:
21 to 31 inches, dark yellowish brown sandy loam
31 to 47 inches, pale brown sandy clay loam
47 to 57 inches, dark yellowish brown sandy clay loam
57 to 60 inches, brown sandy clay loam

Soil Properties and Qualities

Cinnamon Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Medium
Organic matter content: Moderate
Natural fertility: Moderate
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: Occasional for very brief periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The occasional flooding and the moderate hazard of erosion are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. There are no significant management concerns. Establishing and maintaining a mixture of grasses and

legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited for urban uses. Flooding is a severe limitation.

This map unit is unsuited for recreational uses. Flooding is a severe limitation.

This map unit is well suited to use as wildlife habitat. There are no significant management concerns. Areas of the Cinnamon Bay soil are poorly suited to use as wetland wildlife habitat. The depth to water is a management concern.

This map unit is in capability subclass IIc.

CgC—Cinnamon Bay gravelly loam, 5 to 12 percent slopes, occasionally flooded

Setting

Landform position: On alluvial fans and terraces adjacent to volcanic uplands
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Cinnamon Bay and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Carib—somewhat poorly drained soils
- Glynn—soils that have a clayey-skeletal subsoil
- Sandy Point—very poorly drained soils
- Solitude—somewhat poorly drained soils

Similar inclusions

- Soils that do not have a gravelly surface layer or have a very gravelly surface layer
- Soils that have a stony or rubbly surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Cinnamon Bay

Surface layer:
0 to 5 inches, very dark grayish brown gravelly loam

Subsurface layer:
5 to 10 inches, dark brown gravelly loam

Subsoil:
10 to 20 inches, dark yellowish brown gravelly clay loam

Substratum:
20 to 30 inches, dark yellowish brown gravelly sandy loam
30 to 47 inches, pale brown gravelly sandy clay loam
47 to 55 inches, dark yellowish brown gravelly sandy clay loam
55 to 60 inches, brown gravelly sandy clay loam

Soil Properties and Qualities

Cinnamon Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Medium
Organic matter content: Moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: Occasional for very brief periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited to cultivated crops. The occasional flooding, the slope, the severe hazard of erosion, and the high content of rock fragments are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. There are no significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited for urban uses. The flooding and the slope are severe limitations.

This map unit is unsuited for recreational uses. The flooding and the slope are severe limitations.

This map unit is well suited to use as wildlife habitat. There are no significant management concerns. Areas of the Cinnamon Bay soils are poorly suited to use as wetland wildlife habitat. Depth to water is a management concern.

This map unit is in capability subclass IIIe.

CvC—Cramer-Victory complex, 2 to 12 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Cramer and similar soils: 50 percent
Victory and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Maho Bay—soils that have a loamy subsoil
- Parasol—soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly or stony surface layer

Typical Profile

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The severe hazard of erosion, the slope, the shallow to moderately deep rooting depth, the low available water capacity, and the very stony surface are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is suited to pasture and hay. The very low to low available water capacity and the shallow to moderately deep rooting depth are management

concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The depth to bedrock and the high shrink-swell potential of the Cramer soil are management concerns. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the high content of clay in the Cramer soil are severe limitations for septic tank absorption fields. The slope, depth to bedrock, and the high content of clay in the Cramer soil are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, the depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

CvD—Cramer-Victory complex, 12 to 20 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Cramer and similar soils: 50 percent
Victory and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Maho Bay—soils that have a loamy subsoil
- Parasol—soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly or stony surface layer

Typical Profile

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low

Organic matter content: Moderately low
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow to moderately deep rooting depth, the low available water capacity, and the very stony surface are severe limitations.

This map unit is poorly suited to pasture and hay. The slope, the low available water capacity, the very stony surface, and the shallow to moderately deep rooting depth are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope, depth to bedrock, and the high shrink-swell potential of the Cramer soil are management concerns. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the high content of clay in the Cramer soil are severe limitations for septic tank absorption fields. The slope, the depth to bedrock, and the high content of clay in the Cramer soil are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

CvE—Cramer-Victory complex, 20 to 40 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Cramer and similar soils: 50 percent
Victory and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Maho Bay—soils that have a loamy subsoil
- Parasol—soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly or stony surface layer

Typical Profile

Cramer

Surface layer:
0 to 9 inches, dark reddish brown gravelly clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
15 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock
32 to 60 inches, unweathered igneous bedrock

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low
Natural fertility: Moderate
Hazard of erosion: Severe
Depth to water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow to moderately deep rooting depth, the low available water capacity, and the very stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low to low available water capacity, the very stony surface, and the shallow to moderately deep rooting depth are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, depth to bedrock, and high shrink-swell potential of the Cramer soil are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the high content of clay in the Cramer soil are severe limitations for septic tank absorption fields. The slope, the depth to bedrock, and the high content of clay in the Cramer soil are severe limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

CvF—Cramer-Victory complex, 40 to 70 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Cramer and similar soils: 50 percent
Victory and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Maho Bay—soils that have a loamy subsoil
- Parasol—soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly or stony surface layer

Typical Profile

Cramer

Surface layer:
0 to 9 inches, dark reddish brown clay loam

Subsoil:
9 to 14 inches, dark red gravelly clay
14 to 19 inches, dark reddish brown gravelly clay

Bedrock:
19 to 32 inches, weathered igneous bedrock

32 to 60 inches, unweathered igneous bedrock

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Cramer

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Organic matter content: High to very high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow to moderately deep rooting depth, the low available water capacity, and the very stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the low available water capacity, the very stony surface, and the shallow to moderately deep rooting depth are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, depth to bedrock, and the high shrink-swell potential of the Cramer soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

DoE—Dorothea-Susannaberg complex, 20 to 40 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Dorothea and similar soils: 80 percent
Susannaberg and similar soils: 15 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Cramer—soils that have a mixed mineralogy subsoil
- Fredriksdal—soils that have a clayey-skeletal subsoil
- Maho Bay—soils that have a loamy subsoil

Similar inclusions

- Soils that have a gravelly, very gravelly, or stony surface layer
- Soils on slopes of less than 20 percent

Typical Profile

Dorothea

Surface layer:
0 to 6 inches, dark brown clay loam

Subsoil:
6 to 11 inches, brown clay loam
11 to 19 inches, yellowish brown clay
19 to 30 inches, strong brown clay loam

Substratum:
30 to 60 inches, strong brown saprolite

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Dorothea

Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth in the Susannaberg soil, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the extremely stony surface, and the shallow rooting depth in the Susannaberg soil are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, high shrink-swell potential, and the depth to bedrock in the Susannaberg soil are severe limitations. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The clay content and the depth to bedrock in the Susannaberg soil are severe limitations for septic tank absorption fields. The slope, the high shrink-swell potential, and the depth to bedrock in the Susannaberg soil are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth and droughtiness of the Susannaberg soil, and the depth to water are management concerns.

This map unit is in capability subclass VIs.

DoF—Dorothea-Susannaberg complex, 40 to 60 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Dorothea and similar soils: 80 percent

Susannaberg and similar soils: 15 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Cramer—soils that have a mixed mineralogy subsoil
- Fredriksdal—soils that have a clayey-skeletal subsoil
- Maho Bay—soils that have a loamy subsoil

Similar inclusions

- Soils that have a gravelly, very gravelly, or stony surface layer
- Soils on slopes of less than 20 percent

Typical Profile

Dorothea

Surface layer:
0 to 6 inches, dark brown clay loam

Subsoil:
6 to 11 inches, brown clay loam
11 to 19 inches, yellowish brown clay
19 to 30 inches, strong brown clay loam

Substratum:
30 to 60 inches, strong brown saprolite

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Dorothea

Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth in the Susannaberg soil, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the extremely stony surface, and the shallow rooting depth in the Susannaberg soil are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, the high shrink-swell potential, and the depth to bedrock in the Susannaberg soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use a wildlife habitat. The depth to bedrock, the shallow rooting depth and droughtiness of the Susannaberg soil, and the depth to water are management concerns.

This map unit is in capability subclass VIIs.

DoG—Dorothea-Susannaberg complex, 60 to 90 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Dorothea and similar soils: 80 percent
Susannaberg and similar soils: 15 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Cramer—soils that have a mixed mineralogy subsoil
- Fredriksdal—soils that have a clayey-skeletal subsoil
- Maho Bay—soils that have a loamy subsoil

Similar inclusions

- Soils that have a gravelly, very gravelly, or stony surface layer
- Soils on slopes of less than 20 percent

Typical Profile

Dorothea

Surface layer:
0 to 6 inches, dark brown clay loam

Subsoil:
6 to 11 inches, brown clay loam
11 to 19 inches, yellowish brown clay
19 to 30 inches, strong brown clay loam

Substratum:
30 to 60 inches, strong brown saprolite

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Dorothea

Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth in the Susannaberg soil, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the extremely stony surface, and the shallow rooting depth in the Susannaberg soil are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, the high shrink-swell potential, and the depth to bedrock in the Susannaberg soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth and droughtiness of the Susannaberg soil, and the depth to water are management concerns.

This map unit is in capability subclass VIIs.

FsD—Fredriksdal-Susannaberg complex, 12 to 20 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular

Size of areas: 5 to 100 acres

Composition

Fredriksdal and similar soils: 50 percent
Susannaberg and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Dorothea—very deep soils
- Maho Bay—soils that have a loamy subsoil
- Southgate—soils that have a mixed mineralogy subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that do not have a dark surface layer

Typical Profile

Fredriksdal

Surface layer:
0 to 7 inches, dark reddish brown very gravelly clay loam

Subsoil:
7 to 12 inches, reddish brown very gravelly clay loam

Bedrock:
12 to 16 inches, weathered igneous bedrock
16 to 60 inches, unweathered igneous bedrock

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Fredriksdal

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops because of the severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, the depth to bedrock, and the high shrink-swell potential are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the slow percolation rate are severe limitations for septic tank absorption fields. The slope and the depth to bedrock are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The

slope, the depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in land capability subclass VIs.

FsE—Fredriksdal-Susannaberg complex, 20 to 40 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Composition

Fredriksdal and similar soils: 50 percent
Susannaberg and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Dorothea—very deep soils
- Maho Bay—soils that have a loamy subsoil
- Southgate—soils that have a mixed mineralogy subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that do not have a dark surface layer

Typical Profile

Fredriksdal

Surface layer:
0 to 7 inches, dark reddish brown very gravelly clay loam

Subsoil:
7 to 12 inches, reddish brown very gravelly clay loam

Bedrock:
12 to 16 inches, weathered igneous bedrock
16 to 60 inches, unweathered igneous bedrock

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown very gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Fredriksdal

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, the depth to bedrock, and the high shrink-swell potential are severe limitations for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the slow percolation rate are severe limitations for septic tank absorption fields. The slope and the depth to bedrock are severe limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIs.

FsF—Fredriksdal-Susannaberg complex, 40 to 60 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Composition

Fredriksdal and similar soils: 50 percent
Susannaberg and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Dorothea—very deep soils
- Maho Bay—soils that have a loamy subsoil
- Southgate—soils that have a mixed mineralogy subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that do not have a dark surface layer

Typical Profile

Fredriksdal

Surface layer:
0 to 7 inches, dark reddish brown very gravelly clay loam

Subsoil:
7 to 12 inches, reddish brown very gravelly clay loam

Bedrock:
12 to 16 inches, weathered igneous bedrock
16 to 60 inches, unweathered igneous bedrock

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Fredriksdal

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, depth to bedrock, and high shrink-swell potential are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

FsG—Fredriksdal-Susannaberg complex, 60 to 90 percent slopes, extremely stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Composition

Fredriksdal and similar soils: 50 percent
Susannaberg and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Annaberg—soils that have a loamy-skeletal subsoil
- Dorothea—very deep soils
- Maho Bay—soils that have a loamy subsoil
- Southgate—soils that have a mixed mineralogy subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that do not have a dark surface layer

Typical Profile

Fredriksdal

Surface layer:
0 to 7 inches, dark reddish brown very gravelly clay loam

Subsoil:
7 to 12 inches, reddish brown very gravelly clay loam

Bedrock:
12 to 16 inches, weathered igneous bedrock
16 to 60 inches, unweathered igneous bedrock

Susannaberg

Surface layer:
0 to 2 inches, very dark brown clay loam

Subsoil:
2 to 9 inches, very dark brown clay
9 to 15 inches, dark brown gravelly clay loam

Bedrock:
15 to 21 inches, weathered igneous bedrock
21 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Fredriksdal

Drainage class: Well drained
Permeability: Slow
Available water capacity: Very low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Susannaberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: High
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High

Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low and low available water capacity, and the extremely stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low and low available water capacity, the shallow rooting depth, and the extremely stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited for most urban uses. The slope, depth to bedrock, and high shrink-swell potential are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, droughtiness of the soils, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

GyA—Glynn gravelly loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Glynn and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Carib—somewhat poorly drained soils that have a fine-loamy subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Sion—soils that have a coarse-loamy subsoil
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a stony or very stony surface layer
- Soils that have less clay in the subsoil

Typical Profile

Glynn

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown very gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly clay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Soil Properties and Qualities

Glynn

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Medium
Organic matter content: Moderately low to high
Natural fertility: Moderate to high
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The high content of gravel is a management concern. The management systems needed in areas of cropland are those that protect or improve the soil and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It

does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is poorly suited for recreational uses. The flooding and small stones are management concerns.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns, although it is not suited to use as wetland wildlife habitat. The depth to water is a severe limitation.

This map unit is in capability subclass IIc.

GyB—Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Glynn and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Carib—somewhat poorly drained soils that have a fine-loamy subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Sion—soils that have a coarse-loamy subsoil
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a stony or very stony surface layer
- Soils that have less clay in the subsoil

Typical Profile

Glynn

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown very gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly clay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Soil Properties and Qualities

Glynn

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Medium
Organic matter content: Moderately low to high
Natural fertility: Moderate to high
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops (fig. 15).

This map unit is suited for cultivated crops. The moderate hazard of erosion and the high content of gravel are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of

Figure 15.—An area of Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded. Most areas of this soil are used for rangeland. Victory and Southgate soils are in the background.

grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is poorly suited for recreational uses. The flooding and small stones are management concerns.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns, although it is poorly suited to use as wetland wildlife habitat. The depth to water is a severe limitation.

This map unit is in capability subclass IIc.

GyC—Glynn gravelly loam, 5 to 12 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Glynn and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Carib—somewhat poorly drained soils that have a fine-loamy subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Sion—soils that have a coarse-loamy subsoil
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a stony or very stony surface layer
- Soils that have less clay in the subsoil

Typical Profile

Glynn

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown very gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly clay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Soil Properties and Qualities

Glynn

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Medium
Organic matter content: Moderately low to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The slope, the severe hazard of erosion, and the high content of gravel are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is suited to pasture and hay. The slope is a management concern. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is poorly suited for recreational uses. The flooding, the slope, and small stones are management concerns.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns, although it is poorly suited to use as wetland wildlife habitat. The depth to water is a severe limitation.

This map unit is in capability subclass IIIe.

HeA—Hesselberg clay, 0 to 2 percent slopes

Setting

Landform position: On alkaline marine terraces that are adjacent to the sea
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Hesselberg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—soils that have a loamy-skeletal subsoil
- Glynn—very deep soils
- Hogensborg—very deep soils

• Sion—very deep soils

Similar inclusions

• Soils that have a gravelly, very gravelly, stony, or very stony surface layer
• Soils that have a discontinuous petrocalcic layer
• Soils that are moderately deep over a petrocalcic layer

Typical Profile

Hesselberg

Surface layer:
0 to 7 inches, dark reddish brown clay

Subsurface layer:
7 to 12 inches, dark reddish brown clay

Subsoil:
12 to 17 inches, dark red gravelly clay
17 to 18 inches, reddish yellow, pinkish white, and very pale brown partly silicified marl
18 to 24 inches, white partly silicified marl

Substratum:
24 to 60 inches, very pale brown gravelly sandy loam

Soil Properties and Qualities

Hesselberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The shallow rooting depth and the low available water capacity are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is suited to pasture and hay. The low available water capacity and the shallow rooting depth are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The depth to a cemented pan is a management concern for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the cemented pan or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to a cemented pan and the slow percolation rate are severe limitations for septic tank absorption fields.

This map unit is poorly suited for recreational uses. The depth to a cemented pan and the clayey texture of the soil are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to a cemented pan, the low available water capacity, the depth to water, and the droughtiness of the soil are management concerns.

This map unit is in capability subclass IIIc.

HeB—Hesselberg clay, 2 to 5 percent slopes

Setting

Landform position: On alkaline marine terraces that are adjacent to the sea
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Hesselberg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

• Arawak—soils that have a loamy-skeletal subsoil
• Glynn—very deep soils
• Hogensborg—very deep soils
• Sion—very deep soils

Similar inclusions

• Soils that have a gravelly, very gravelly, stony, or very stony surface layer
• Soils that have a discontinuous petrocalcic layer
• Soils that are moderately deep over a petrocalcic layer

Typical Profile

Hesselberg

Surface layer:
0 to 7 inches, dark reddish brown clay

Subsurface layer:
7 to 12 inches, dark reddish brown clay

Subsoil:
12 to 17 inches, dark red gravelly clay
17 to 18 inches, reddish yellow, pinkish white, and very pale brown partly silicified marl
18 to 24 inches, white partly silicified marl

Substratum:
24 to 60 inches, very pale brown gravelly sandy loam

Soil Properties and Qualities

Hesselberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The moderate hazard of erosion, the shallow rooting depth, and the low available water capacity are management concerns. The management systems needed in areas of cropland are those that minimize erosion, protect or improve the soil, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is suited to pasture and hay. The low available water capacity and the shallow rooting depth are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The depth to a cemented pan is a management concern for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the cemented pan or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to a cemented pan and the very slow percolation rate are severe limitations for septic tank absorption fields.

This map unit is poorly suited for recreational uses. The depth to a cemented pan and the clayey subsoil are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to a cemented pan, the low available water capacity, the depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass IIIc.

HeC—Hesselberg clay, 5 to 12 percent slopes

Setting

Landform position: On alkaline marine terraces that are adjacent to the sea
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Hesselberg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—soils that have a loamy-skeletal subsoil
- Glynn—very deep soils
- Hogensborg—very deep soils
- Sion—very deep soils

Similar inclusions

- Soils that have a gravelly, very gravelly, stony, or very stony surface layer
- Soils that have a discontinuous petrocalcic layer
- Soils that are moderately deep over a petrocalcic layer

Typical Profile

Hesselberg

Surface layer:
0 to 7 inches, dark reddish brown clay

Subsurface layer:
7 to 12 inches, dark reddish brown clay

Subsoil:
12 to 17 inches, dark red gravelly clay
17 to 18 inches, reddish yellow, pinkish white, and very pale brown partly silicified marl
18 to 24 inches, white partly silicified marl

Substratum:
24 to 60 inches, very pale brown gravelly sandy loam

Soil Properties and Qualities

Hesselberg

Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth, and the low available water capacity are management concerns. The management systems needed in areas of cropland are those that minimize erosion, protect or improve the soil, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is suited to pasture and hay. The slope, the low available water capacity, and the shallow rooting depth are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope and depth to a cemented pan are management concerns for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the cemented pan or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to a cemented pan, the slope, and the very slow percolation rate are severe limitations for septic tank absorption fields.

This map unit is poorly suited for recreational uses. The depth to a cemented pan and the clayey subsoil are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to a cemented pan, the low available water capacity, the depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass IIIc.

HgA—Hogensborg clay loam, 0 to 2 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 250 acres

Composition

Hogensborg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—soils that have a clayey-skeletal subsoil
- Hesselberg—shallow soils
- Sion—soils that have a coarse-loamy subsoil

Similar inclusions

- Soils that have an alkaline subsoil
- Soils that have a gravelly, very gravelly, stony or very stony surface layer
- Soils that have a petrocalcic subsurface layer
- Soils that have a thick, dark surface layer

Typical Profile

Hogensborg

Surface layer:
0 to 6 inches, very dark grayish brown clay loam

Subsurface layer:
6 to 13 inches, dark grayish brown clay loam

Subsoil:
13 to 62 inches, light olive brown clay

Substratum:
62 to 76 inches, strong brown gravelly clay loam
76 to 88 inches, strong brown clay loam

Soil Properties and Qualities

Hogensborg

Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Very high
Salinity: Slightly saline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is well suited for cultivated crops. It does not have any significant management concerns. The management systems needed in areas of cropland are those that improve the soil, minimize crusting and clodding, maintain and improve tilth, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding, the very slow permeability, and the very high shrink-swell potential are severe limitations.

This map unit is poorly suited for recreational uses. The flooding and the slow permeability are management concerns.

This map unit is suited to use as wildlife habitat and is poorly suited to wetland wildlife habitat. The clayey subsoil, excess sodium, and depth to water are management concerns.

This map unit is in capability subclass IIIc.

HgB—Hogensborg clay loam, 2 to 5 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 250 acres

Composition

Hogensborg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—soils that have a clayey-skeletal subsoil
- Hesselberg—shallow soils
- Sion—soils that have a coarse-loamy subsoil

Similar inclusions

- Soils that have an alkaline subsoil
- Soils that have a gravelly, very gravelly, stony, or very stony surface layer
- Soils that have a petrocalcic subsurface layer
- Soils that have a thick, dark surface layer

Typical Profile

Hogensborg

Surface layer:
0 to 6 inches, very dark grayish brown clay loam

Subsurface layer:
6 to 13 inches, dark grayish brown clay loam

Subsoil:
13 to 62 inches, light olive brown clay

Substratum:
62 to 76 inches, strong brown gravelly clay loam
76 to 88 inches, strong brown clay loam

Soil Properties and Qualities

Hogensborg

Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches

Shrink-swell potential: Very high
Salinity: Slightly saline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The moderate hazard of erosion is a management concern. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, minimize clodding and crusting, maintain and improve tilth, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding, the very slow permeability, and the very high shrink-swell potential are severe limitations.

This map unit is poorly suited for recreational uses. The flooding and the slow permeability are management concerns.

This map unit is suited to use as wildlife habitat. It is poorly suited to use as habitat for wetland wildlife. The clayey subsoil, excess sodium, and the depth to water are management concerns.

This map unit is in capability subclass IIIc.

HgC—Hogensborg clay loam, 5 to 12 percent slopes, rarely flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 250 acres

Composition

Hogensborg and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Glynn—soils that have a clayey-skeletal subsoil
- Hesselberg—shallow soils
- Sion—soils that have a coarse-loamy subsoil

Similar inclusions

- Soils that have an alkaline subsoil
- Soils that have a gravelly, very gravelly, stony, or very stony surface layer
- Soils that have a petrocalcic subsurface layer
- Soils that have a thick, dark surface layer

Typical Profile

Hogensborg

Surface layer:
0 to 6 inches, very dark grayish brown clay loam

Subsurface layer:
6 to 13 inches, dark grayish brown clay loam

Subsoil:
13 to 62 inches, light olive brown clay

Substratum:
62 to 76 inches, strong brown gravelly clay loam
76 to 88 inches, strong brown clay loam

Soil Properties and Qualities

Hogensborg

Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Very high
Salinity: Slightly saline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The slope and the severe hazard of erosion are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, minimize

clodding and crusting, maintain and improve tilth, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding, the slope, the very slow permeability, and the very high shrink-swell potential are severe limitations.

This map unit is poorly suited for recreational uses. The flooding and the slow percolation rate are management concerns.

This map unit is suited to use as wildlife habitat. The clayey subsoil, excess sodium, and the depth to water are management concerns.

This map unit is in capability subclass IIIc.

JaB—Jaucas sand, 0 to 5 percent slopes, rarely flooded

Setting

Landform position: On calcareous coastal beaches
Shape of areas: Irregular
Size of areas: 4 to 100 acres

Composition

Jaucas and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cinnamon Bay—well drained soils that have a fine-loamy subsoil
- Glynn—well drained soils that have a clayey-skeletal subsoil
- Sandy Point—very poorly drained soils
- Solitude—somewhat poorly drained soils
- Sugar Beach—very poorly drained soils

Similar inclusions

- Soils that have a sandy-skeletal subsoil
- Soils that have a stony or very stony surface layer

Typical Profile

Jaucas

Surface layer:
0 to 6 inches, grayish brown sand

Substratum:
6 to 16 inches, light brownish gray sand
16 to 26 inches, pale brown sand
26 to 60 inches, very pale brown sand

Soil Properties and Qualities

Jaucas

Drainage class: Excessively drained
Permeability: Very rapid
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Moderately saline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly for recreational uses and as wildlife habitat.

This map unit is unsuited to cultivated crops. The moderate salinity and the low available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The low available water capacity and the moderate salinity are severe imitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is unsuited to most recreational uses. Flooding, the sandy subsoil, and excess salt are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The sandy subsoil, the depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass VIIs.

JsD—Jealousy-Southgate complex, 12 to 20 percent slopes

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Jealousy and similar soils: 50 percent
Southgate and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey, mixed subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Jealousy

Surface layer:
0 to 9 inches, very dark brown gravelly clay loam

Subsurface layer:
9 to 15 inches, very dark brown gravelly clay loam

Subsoil:
15 to 26 inches, dark yellowish brown gravelly clay loam

Substratum:
26 to 38 inches, very dark grayish brown gravelly clay loam

Bedrock:
38 to 60 inches, weathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Jealousy

Drainage class: Well drained
Permeability: Slow
Available water capacity: Medium
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth of the Southgate soil, and the very low to medium available water capacity are severe limitations.

This map unit is poorly suited to pasture and hay. The slope, the very low to medium available water capacity, and the shallow rooting depth of the Southgate soil are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope, the depth to bedrock, and the high shrink-swell potential of the Jealousy soil are management concerns for dwellings and small commercial buildings. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The slope, the depth to bedrock, and the slow to very slow percolation rate of the Southgate soil are severe limitations for septic tank absorption fields. The slope and the depth to bedrock are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, the depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock and droughtiness of the Southgate soil and the depth to water are management concerns.

The Jealousy soil in this map unit is in capability subclass IVe. The Southgate soil is in capability subclass VIs.

JsE—Jealousy-Southgate complex, 20 to 40 percent slopes

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Jealousy and similar soils: 50 percent
Southgate and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey, mixed subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Jealousy

Surface layer:
0 to 9 inches, very dark brown gravelly clay loam

Subsurface layer:
9 to 15 inches, very dark brown gravelly clay loam

Subsoil:
15 to 26 inches, dark yellowish brown gravelly clay loam

Substratum:
26 to 38 inches, very dark grayish brown gravelly clay loam

Bedrock:
38 to 60 inches, weathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Jealousy

Drainage class: Well drained
Permeability: Slow
Available water capacity: Medium
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches

Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth of the Southgate soil, and the very low to medium available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low to medium available water capacity, and the shallow rooting depth of the Southgate soil are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, depth to bedrock, and the high shrink-swell potential of the Jealousy soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, the depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock and droughtiness of the Southgate soil and the depth to water are management concerns.

The Jealousy soil in this map unit is in capability subclass VIe. The Southgate soil is in capability subclass VIs.

JsF—Jealousy-Southgate complex, 40 to 70 percent slopes

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 200 acres

Composition

Jealousy and similar soils: 50 percent
Southgate and similar soils: 30 percent
Contrasting inclusions: 20 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey, mixed subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that do not have a gravelly surface layer
- Soils that have a very gravelly or stony surface layer

Typical Profile

Jealousy

Surface layer:
0 to 9 inches, very dark brown gravelly clay loam

Subsurface layer:
9 to 15 inches, very dark brown gravelly clay loam

Subsoil:
15 to 26 inches, dark yellowish brown gravelly clay loam

Substratum:
26 to 38 inches, very dark grayish brown gravelly clay loam

Bedrock:
38 to 60 inches, weathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Jealousy

Drainage class: Well drained
Permeability: Slow
Available water capacity: Medium
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low

Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the shallow rooting depth of the Southgate soil, and the very low to medium available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low to medium available water capacity, and the shallow rooting depth of the Southgate soil are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope, the depth to bedrock, and the high shrink-swell potential of the Jealousy soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, the depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock and droughtiness of the Southgate soil and the depth to water are management concerns.

The Jealousy soil in this map unit is in capability subclass VIIe. The Southgate soil is in capability subclass VIIs.

LmC—Lameshur gravelly sandy loam, 2 to 12 percent slopes, rubbly, occasionally flooded

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 100 acres

Composition

Lameshur and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cinnamon Bay—soils that have a fine-loamy subsoil
- Sandy Point—very poorly drained soils
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly or very cobbly surface layer
- Soils that do not have a rubble-covered surface layer

Typical Profile

Lameshur

Surface layer:
0 to 6 inches, brown gravelly sandy loam

Subsurface layer:
6 to 10 inches, brown very gravelly loamy sand

Substratum:
10 to 18 inches, light brown extremely gravelly loamy sand
18 to 35 inches, strong brown extremely stony sandy clay loam
35 to 60 inches, yellowish red extremely stony loamy sand

Soil Properties and Qualities

Lameshur

Drainage class: Excessively drained
Permeability: Moderately rapid
Available water capacity: Low
Organic matter content: Moderate
Natural fertility: Moderate
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: Occasional for brief periods from April to December
Stoniness: Rubbly

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture or hay.

This map unit is unsuited to cultivated crops. The high content of rock fragments, the low available water capacity, and the rubbly surface are severe limitations.

This map unit is poorly suited to pasture and hay. The rubbly surface and the low available water

capacity are management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is unsuited for recreational uses. The flooding and the stony surface are severe limitations.

This map unit is suited to use as wildlife habitat. The low available water capacity, stoniness, the depth to water, and frequent periods of drought are management concerns.

This map unit is in capability subclass VIIs.

PaB—Parasol clay loam, 2 to 5 percent slopes

Setting

Landform position: On side slopes and foot slopes of plutonic gabbro and diorite uplands
Shape of areas: Irregular
Size of areas: 4 to 150 acres

Composition

Parasol and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—shallow soils
- Jealousy—moderately deep soils
- Maho Bay—shallow soils that have a loamy subsoil
- Southgate—shallow soils that have a loamy-skeletal subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a thin, dark surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Parasol

Surface layer:
0 to 13 inches, very dark brown clay loam

Subsoil:
13 to 19 inches, brown clay loam
19 to 24 inches, brown sandy clay loam
24 to 40 inches, dark yellowish brown sandy clay loam

Substratum:
40 to 80 inches, brown saprolite

Soil Properties and Qualities

Parasol

Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The moderate hazard of erosion is a management concern. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited for urban uses. The high shrink-swell potential is a management concern for dwellings and small commercial buildings. All structures and roads should be designed so that the shrink-swell characteristics of the soil are minimized.

This map unit is suited for recreational uses. The slope is a management concern for playgrounds.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns, although it is poorly suited to use as wetland

wildlife habitat. The depth to water is a severe limitation.

This map unit is in capability subclass IIc.

PaC—Parasol clay loam, 5 to 12 percent slopes

Setting

Landform position: On side slopes and foot slopes of plutonic gabbro and diorite uplands
Shape of areas: Irregular
Size of areas: 4 to 150 acres

Composition

Parasol and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—shallow soils
- Jealousy—moderately deep soils
- Maho Bay—shallow soils that have a loamy subsoil
- Southgate—shallow soils that have a loamy-skeletal subsoil
- Victory—moderately deep soils that have a loamy-skeletal subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a thin, dark surface layer
- Soils that are shallow over bedrock

Typical Profile

Parasol

Surface layer:
0 to 13 inches, very dark brown clay loam

Subsoil:
13 to 19 inches, brown clay loam
19 to 24 inches, brown sandy clay loam
24 to 40 inches, dark yellowish brown sandy clay loam

Substratum:
40 to 80 inches, brown saprolite

Soil Properties and Qualities

Parasol

Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Low to moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: High
Salinity: Nonsaline
Flooding: None
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is poorly suited for cultivated crops. The severe hazard of erosion and the slope are management concerns. The management systems needed in areas of cropland are those that protect or improve the soil, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope and the high shrink-swell potential are management concerns. All structures should be designed so that the high shrink-swell characteristics of the soil are minimized and so that they conform to the natural slope of the land. The roads should be built on the contour or designed so that they conform to the natural slope of the land.

This map unit is poorly suited for recreational uses. The slope is a management concern.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns, although it is poorly suited to use as wetland wildlife habitat. The depth to water is a severe limitation.

This map unit is in capability subclass IIIe.

Pt—Pits, quarries

This map unit consists of areas from which rock, gravel, or sand have been removed for use in construction. In gently sloping to strongly sloping areas, the excavations are generally 5 to 15 feet deep and have steep sides and a nearly level floor. In

moderately steep to very steep areas, the excavations may be hundreds of feet in depth.

Most pits and quarries generally range from about 2 to 20 acres in size, but some areas are larger. Many pits have been abandoned and are sparsely covered with shrubs and grasses. An onsite investigation is needed to determine the suitability or potential of the map unit for any use and to determine the amount of reclamation needed.

This map unit is in capability subclass VIIIs.

RdB—Redhook extremely stony sand, 0 to 5 percent slopes, rubbly, rarely flooded

Setting

Landform position: On coastal beaches that are composed of calcareous sand
Shape of areas: Irregular
Size of areas: 4 to 100 acres

Composition

Redhook and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cinnamon Bay—soils that have a fine-loamy subsoil
- Glynn—soils that have a clayey-skeletal subsoil
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil
- Sugar Beach—very poorly drained, organic soils

Similar inclusions

- Moderately well drained soils that have a saline subsoil
- Soils that have a gravelly or very gravelly surface layer

Typical Profile

Redhook

Surface layer:
0 to 7 inches, dark brown extremely stony sand

Substratum:
7 to 10 inches, brown very stony sand
10 to 16 inches, very pale brown very gravelly sand
16 to 60 inches, white very gravelly sand

Soil Properties and Qualities

Redhook

Drainage class: Excessively drained
Permeability: Very rapid
Available water capacity: Low
Organic matter content: Low
Natural fertility: Low
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Moderately saline
Flooding: Rare
Stoniness: Rubbly

Use and Management

This map unit is used mainly for recreational purposes and as wildlife habitat.

This map unit is unsuited to cultivated crops. The high content of gravel and stones, the moderate salinity, and the low available water capacity are severe limitations.

This map unit is unsuited to pasture and hay. The low available water capacity and the moderate salinity are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding is a severe limitation.

This map unit is unsuited for recreational uses. The flooding and the content of sand, gravel, and stones are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The sandy subsoil, content of stones, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIs.

SaA—Salt flats, ponded

This map unit consists of unvegetated areas of saline flats, saline marshes, and salt ponds. The areas are prone to ponding and flooding resulting from gut flow, marine tides, and marine storm surges. The soils are very deep, poorly drained and very poorly drained, strongly saline, and frequently ponded for very long periods. An onsite investigation is required to determine the suitability or potential of the map unit for any use.

This map unit is in capability subclass VIIIw.

SBA—Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded

Setting

Landform position: On nearly level saline marshes, saline flats, and salt ponds that are adjacent to sea
Shape of areas: Irregular
Size of areas: 2 to 100 acres

Composition

Sandy Point, Sugar Beach, and similar soils: 95 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Cinnamon Bay—well drained soils
- Glynn—well drained soils that have a clayey-skeletal subsoil
- Jaucas—excessively drained soils that have a carbonatic subsoil
- Redhook—excessively drained soils that have a sandy-skeletal subsoil
- Solitude—somewhat poorly drained soils

Similar inclusions

- Very poorly drained, mineral soils that have thick organic subsurface horizons
- Very poorly drained, organic soils that have thick mineral subsurface horizons

Typical Profile

Sandy Point

Surface layer:
0 to 3 inches, olive gray sandy clay loam
3 to 6 inches, dark gray sandy clay loam

Substratum:
6 to 33 inches, very dark gray clay loam
33 to 45 inches, dark brown muck
45 to 60 inches, gray mucky clay loam

Sugar Beach

Surface layer:
0 to 4 inches, black muck

Substratum:
4 to 8 inches, dark grayish brown mucky clay loam
8 to 60 inches, dark brown muck

Soil Properties and Qualities

Sandy Point

Drainage class: Very poorly drained
Permeability: Slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Low to moderate
Hazard of erosion: Slight
Seasonal high water table: Apparent, about 1 foot above the surface to a depth of 0.5 foot from April to December
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Strongly saline
Flooding: Frequent for very long periods from April to December
Stoniness: Nonstony

Sugar Beach

Drainage class: Very poorly drained
Permeability: Slow
Available water capacity: High
Organic matter content: Very high
Natural fertility: Moderate
Hazard of erosion: Slight
Seasonal high water table: Apparent, about 1 foot above the surface to a depth of 0.5 foot from April to December
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Strongly saline
Flooding: Frequent for very long periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is used mainly as wildlife habitat.

This map unit is unsuited to cultivated crops. The flooding for very long periods, the frequent ponding, and the strong salinity are severe limitations.

This map unit is unsuited to pasture and hay. The flooding, ponding, strong salinity, and wetness are severe limitations.

This map unit is unsuited to most urban uses. The flooding, ponding, and wetness are severe limitations.

This map unit is unsuited for recreational uses. The flooding, ponding, and wetness are severe limitations.

This map unit is poorly suited as habitat for upland wildlife and wetland freshwater wildlife. Flooding for long periods, ponding, wetness, and the strongly saline subsoil are severe limitations. This map unit is well

suited to marine wetland wildlife habitat. It does not have any significant management concerns for this use.

This map unit is in capability subclass VIIIw.

SiA—Sion clay, 0 to 2 percent slopes, rarely flooded

Setting

Landform position: Side slopes and valley floors of alkaline marine deposits
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Sion and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Glynn—soils that have a clayey-skeletal subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Hogensborg—soils that have a clayey subsoil

Similar inclusions

- Soils that have an acid surface layer
- Soils that have a lighter-colored surface layer
- Soils that are moderately deep over limestone bedrock

Typical Profile

Sion

Surface layer:
0 to 6 inches, very dark grayish brown clay

Subsurface layer:
6 to 12 inches, dark brown clay

Subsoil:
12 to 16 inches, brown gravelly clay

Substratum:
16 to 24 inches, pinkish white gravelly sandy clay loam
24 to 32 inches, pinkish white gravelly sandy loam
32 to 60 inches, pinkish white loam

Soil Properties and Qualities

Sion

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Slight
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as range. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited to cultivated crops. The moderate alkalinity of the subsoil is a severe limitation for some crops. The management systems needed in areas of cropland are those that protect and improve the soil and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The rare flooding is a severe limitation.

This map unit is poorly suited for recreational uses. The rare flooding is a management concern. Filling in the site or constructing buildings on pilings to a height above the flood level helps to minimize this limitation.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns. The potential for use as wetland wildlife habitat is very poor. The depth to water is a management concern.

This map unit is in capability subclass IIIc.

SiB—Sion clay, 2 to 5 percent slopes, rarely flooded

Setting

Landform position: On side slopes and valley floors of alkaline marine uplands
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Sion and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Glynn—soils that have a clayey-skeletal subsoil
- Hesselberg—soils that have a shallow, clayey subsoil
- Hogensborg—soils that have a clayey subsoil

Similar inclusions

- Soils that have an acid surface layer
- Soils that have a lighter-colored surface layer
- Soils that are moderately deep over limestone bedrock

Typical Profile

Sion

Surface layer:
0 to 6 inches, very dark grayish brown clay

Subsurface layer:
6 to 12 inches, dark brown clay

Subsoil:
12 to 16 inches, brown gravelly clay

Substratum:
16 to 24 inches, pinkish white gravelly sandy clay loam
24 to 32 inches, pinkish white gravelly sandy loam
32 to 60 inches, pinkish white loam

Soil Properties and Qualities

Sion

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Organic matter content: Moderate to high
Natural fertility: Moderate to high
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is suited for cultivated crops. The moderate hazard of erosion is a management concern. The moderate alkalinity of the subsoil is a severe limitation for some crops. The management systems needed in areas of cropland are those that minimize erosion, protect and improve the soil, and minimize the water pollution caused by plant nutrients, soil particles, and plant residue carried by runoff.

This map unit is well suited to pasture and hay. It does not have any significant management concerns. Establishing and maintaining a mixture of grasses and legumes, deferring grazing as needed, controlling weeds, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion.

The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The rare flooding is a severe limitation.

This map unit is poorly suited for recreational uses. The rare flooding is a management concern. Filling in the site or constructing buildings on pilings to a height above the flood level help to minimize this limitation.

This map unit is well suited to use as wildlife habitat. It does not have any significant management concerns. The potential for use as wetland wildlife habitat is very poor. The depth to water is a management concern.

This map unit is in capability subclass IIIc.

SoA—Solitude gravelly fine sandy loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform position: In areas that are adjacent to saline marshes, flats, and salt ponds of mixed, terrestrial and marine sediments
Shape of areas: Irregular
Size of areas: 4 to 75 acres

Composition

Solitude and similar soils: 85 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Carib—soils that have a dark surface layer
- Cinnamon Bay—well drained soils
- Glynn—well drained soils that have a clayey-skeletal subsoil

- Jaucas—excessively drained soils
- Redhook—excessively drained soils that have a sandy-skeletal subsoil
- Sandy Point—very poorly drained soils that have a organic subsoil
- Sugar Beach—very poorly drained soils

Similar inclusions

- Soils that are poorly drained
- Soils that have a thick, dark surface layer
- Soils that have a stony or very stony surface layer

Typical Profile

Solitude

Surface layer:
0 to 6 inches, light olive brown gravelly fine sandy loam

Subsoil:
6 to 10 inches, light olive brown gravelly fine sandy loam
10 to 28 inches, grayish brown fine sandy loam
28 to 57 inches, grayish brown gravelly loam
57 to 61 inches, light olive brown gravelly fine sandy loam

Soil Properties and Qualities

Solitude

Drainage class: Somewhat poorly drained
Permeability: Slow
Available water capacity: Medium
Organic matter content: Moderate
Natural fertility: Low to moderate
Hazard of erosion: Slight
Seasonal high water table: Apparent, at a depth of 1.0 to 2.5 feet from April to December
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Slightly saline to strongly saline in the surface layer, moderately saline to strongly saline in the subsoil
Flooding: Frequent for brief periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is used mainly as wildlife habitat.

This map unit is unsuited to cultivated crops. The wetness, frequent flooding, and slight to strong salinity are severe limitations.

This map unit is unsuited to pasture and hay. The flooding and salinity are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The flooding and wetness are severe limitations.

This map unit is unsuited for recreational uses. The flooding and wetness are severe limitations.

This map unit is unsuited to use as freshwater wetland wildlife habitat. Salinity is a severe limitation. This map unit is suited to use as marine wetland wildlife habitat. The depth to water is a management concern.

This map unit is in capability subclass IVw.

SrD—Southgate-Rock outcrop complex, 12 to 20 percent slopes

Setting

Landform position: Summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Southgate and similar soils: 45 percent
Rock outcrop: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that have a very gravelly, stony, or rubbly surface layer
- Soils that have a thick, dark surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, the extremely stony surface, and the exposed bedrock are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, the extremely stony surface, and the exposed bedrock are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope and the depth to bedrock are management concerns. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock limits the use of this map unit as a site for septic tank absorption fields. The use of alternate disposal systems will help to overcome this limitation. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope and depth to bedrock are management concerns.

This map unit is poorly suited to wildlife habitat. The depth to bedrock, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIIs.

SrE—Southgate-Rock outcrop complex, 20 to 40 percent slopes

Setting

Landform position: Summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 3 to 300 acres

Composition

Southgate and similar soils: 45 percent
Rock outcrop: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that have a very gravelly, stony, or rubbly surface layer
- Soils that have a thick, dark surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep

Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, a very low available water capacity, the extremely stony surface, and the exposed bedrock are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, and the exposed bedrock are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope and the depth to bedrock are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIIs.

SrF—Southgate-Rock outcrop complex, 40 to 60 percent slopes

Setting

Landform position: Summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Southgate and similar soils: 45 percent
Rock outcrop: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that have a very gravelly, stony, or rubbly surface layer
- Soils that have a thick, dark surface layer
- Soils that are moderately deep over bedrock

Typical Profile

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, the extremely stony surface, and the exposed bedrock are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, the extremely stony surface, and the exposed bedrock are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope and the depth to bedrock are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, droughtiness, and depth to water are management concerns.

This map unit is in capability subclass VIIIs.

SrG—Southgate-Rock outcrop complex, 60 to 90 percent slopes

Setting

Landform position: Summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Southgate and similar soils: 45 percent
Rock outcrop: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils

Similar inclusions

- Soils that have a very gravelly, stony, or rubbly surface layer
- Soils that have a thick, dark surface layer
- Soils that are moderately deep over bedrock
- Areas of cliffs that are adjacent to the shoreline

Typical Profile

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Extremely stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow rooting depth, the very low available water capacity, the extremely stony surface, and the exposed bedrock are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low available water capacity, the shallow rooting depth, the extremely stony surface, and the exposed bedrock are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock are severe limitations.

This map unit is unsuited for recreational uses. The slope and depth to bedrock are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, droughtiness of the soil, and depth to water are management concerns.

This map unit is in capability subclass VIIIs.

UbD—Urban land

This map unit consists of areas that have more than 70 percent of the surface covered by airports, shopping centers, parking lots, large buildings, streets, sidewalks, or other impervious surfaces. Slopes are mainly 0 to 20 percent, but they range from 0 to 60 percent. Closely associated areas, such as lawns, parks, vacant lots, and playgrounds, contain natural soils, but these areas were too small to be mapped separately.

This map unit is in land capability subclass VIIIs.

UcC—Urban land-Cinnamon Bay complex, 0 to 12 percent slopes, occasionally flooded

This map unit consists of Urban land and very deep, well drained alluvial soils that are so intermingled that it was not practical to map them separately. The Urban land consists of airports, shopping centers, parking lots, large buildings, streets, sidewalks, or other impervious surfaces. Closely associated areas, such as lawns, parks, vacant lots, and playgrounds, contain natural soils, but these areas were too small to be mapped separately.

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 100 acres

Composition

Urban land: 80 percent
Cinnamon Bay and similar soils: 15 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Sandy Point—very poorly drained soils
- Solitude—somewhat poorly drained soils

Similar inclusions

- Soils that have a gravelly or very gravelly surface layer
- Soils that have a stony or very stony surface layer
- Areas of Urban land on slopes of more than 12 percent

Typical Profile

Cinnamon Bay

Surface layer:
0 to 3 inches, very dark grayish brown loam

Subsurface layer:
3 to 11 inches, dark brown loam

Subsoil:
11 to 21 inches, dark yellowish brown clay loam

Substratum:
21 to 31 inches, dark yellowish brown sandy loam
31 to 47 inches, pale brown sandy clay loam
47 to 57 inches, dark yellowish brown sandy clay loam
57 to 60 inches, brown sandy clay loam

Soil Properties and Qualities

Cinnamon Bay

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Medium
Organic matter content: Moderate
Natural fertility: Moderate
Hazard of erosion: Moderate
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: Occasional for very brief periods from April to December
Stoniness: Nonstony

Use and Management

This map unit is unsuited to most urban uses. Flooding is a severe limitation. If this map unit is developed, offsite fill material or pilings should be used to raise the structure above the maximum flood stage.

The areas of Cinnamon Bay soil in this map unit are poorly suited for recreational uses. Flooding is a management concern. If this map unit is developed, offsite fill material or pilings should be used to raise the structure above the maximum flood stage.

The areas of Cinnamon Bay soil in this map unit are well suited to use as wildlife habitat areas. These areas have no significant management concerns. The potential for Cinnamon Bay soils in the map unit to be used as wetland wildlife habitat is poor. The depth to water is a management concern.

This map unit is in capability subclass VIIIs.

UgC—Urban land-Glynn complex, 0 to 12 percent slopes, rarely flooded

This map unit consists of Urban land and very deep, well drained alluvial soils that are so intermingled that it was not practical to map them separately. The Urban land is composed of airports, shopping centers, parking lots, large buildings, streets, sidewalks, or other impervious surfaces. Closely associated areas, such as lawns, parks, vacant lots, and playgrounds, contain natural soils, but these areas were too small to be mapped separately.

Setting

Landform position: On alluvial fans and terraces
Shape of areas: Irregular
Size of areas: 3 to 90 acres

Composition

Urban land: 80 percent
Glynn and similar soils: 15 percent
Contrasting inclusions: 5 percent

Minor Components

Contrasting inclusions

- Arawak—soils that have a shallow, loamy-skeletal subsoil
- Carib—somewhat poorly drained soils that have a fine-loamy subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Sion—soils that have a coarse-loamy subsoil
- Solitude—somewhat poorly drained soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a very gravelly surface layer
- Soils that have a stony or very stony surface layer
- Areas of Urban land on slopes of more than 12 percent

Typical Profile

Glynn

Surface layer:
0 to 4 inches, dark brown gravelly loam

Subsurface layer:
4 to 10 inches, dark brown gravelly clay loam

Subsoil:
10 to 17 inches, dark yellowish brown very gravelly clay
17 to 27 inches, yellowish brown very gravelly clay loam

Substratum:
27 to 32 inches, yellowish brown very gravelly sandy clay loam
32 to 41 inches, light olive brown very gravelly clay
41 to 60 inches, light olive brown very gravelly sandy clay loam

Soil Properties and Qualities

Glynn

Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Organic matter content: Moderately low to high
Natural fertility: Moderate to high
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: More than 60 inches
Root zone: More than 60 inches
Shrink-swell potential: Moderate
Salinity: Nonsaline
Flooding: Rare
Stoniness: Nonstony

Use and Management

This map unit is poorly suited for urban uses. Flooding is a severe limitation. If this map unit is developed, offsite fill material or pilings should be used to raise the structure above the maximum flood stage.

The areas of Glynn soil in this map unit are poorly suited for recreational uses. Flooding is a management concern. If this map unit is developed, offsite fill material or pilings should be used to raise the structure above the maximum flood stage.

The areas of Glynn soil in this map unit are well suited to use as wildlife habitat. These areas have no significant management concerns. The potential for the Glynn soil in this map unit to be used as wetland wildlife habitat is poor. The depth to water is a management concern.

This map unit is in capability subclass VIIIs.

Us—Ustorthents

This map unit is made up of areas that have been altered from their natural state by human activities. Generally, these areas are associated with cutting and filling activities associated with construction of airports, roads, shopping centers, buildings, storm drains, housing developments, recreational areas, and similar projects. Some are associated with disposal areas for quarry, refinery, or landfill operations. Terrestrial, constructed areas along the sea coast are included. Individual areas of this map unit range from about 3 to 100 acres in size. The slope is mainly 2 to 20 percent, but it ranges from 0 to 90 percent.

Composition

Ustorthents: 75 percent
Contrasting inclusions: 25 percent

Minor Components

- Arawak—shallow soils that have a loamy-skeletal subsoil
- Cinnamon Bay—very deep soils that have a fine-loamy subsoil
- Glynn—very deep soils that have a clayey-skeletal subsoil
- Hesselberg—shallow soils that have a clayey subsoil
- Hogensborg—very deep soils that have a clayey subsoil
- Jaucas—very deep soils that have a excessively drained subsoil

• Sion—very deep soils that have a coarse-loamy subsoil

Soil Properties and Qualities

The properties and characteristics of the Ustorthents vary so considerably that an onsite investigation is needed to determine the suitability for most uses. Because of the variability of these soils, a typical profile is not given.

This map unit is in capability subclass VIe.

VsC—Victory-Southgate complex, 2 to 12 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300

Composition

Victory and similar soils: 45 percent
Southgate and similar soils: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

• Cramer—soils that have a clayey subsoil
• Jealousy—soils that have a clayey subsoil
• Maho Bay—soils that have a loamy subsoil
• Parasol—very deep soils that have a fine-loamy subsoil

Similar inclusions

• Soils that have a dark surface layer
• Soils that have a gravelly, very gravelly, or stony surface layer

Typical Profile

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low to high
Natural fertility: Low to moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow to moderately deep rooting depth, the very low to low available water capacity, and the very stony surface are severe limitations.

This map unit is poorly suited to pasture and hay.

The slope, the very low to low available water capacity, the shallow to moderately deep rooting depth, and the very stony surface are management concerns. Establishing and maintaining a mixture of grasses and legumes, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map is poorly suited to most urban uses. The slope and the depth to bedrock in the Southgate soil are management concerns. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the high content of rock fragments in the Southgate soil are limitations for septic tank absorption fields. The slope and the depth to bedrock are limitations for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the slope, rooting depth, depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass VIs.

VsD—Victory-Southgate complex, 12 to 20 percent slopes, very stony

Setting

Landform position: On sloping summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300

Composition

Victory and similar soils: 45 percent
Southgate and similar soils: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a dark surface layer
- Soils that have a gravelly, very gravelly, or stony surface layer

Typical Profile

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low to high
Natural fertility: Low to moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow to moderately deep rooting depth, the very low to low available water capacity, and the very stony surface are severe limitations.

This map unit is poorly suited to pasture and hay. The slope, the very low to low available water capacity, the shallow to moderately deep rooting depth, and the very stony surface are management concerns. Establishing and maintaining a mixture of grasses and legumes, using proper stocking rates, and maintaining soil fertility increase the production of forage and feed and help to control erosion. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is poorly suited to most urban uses. The slope and the depth to bedrock in the Southgate soil are management concerns. All structures should be designed so that they conform to the natural slope of the land. Ripping the bedrock or building above it and landscaping with fill material help to overcome the depth to bedrock. The depth to bedrock and the high content of rock fragments in the Southgate soil are severe limitations for septic tank absorption fields. The slope and the depth to bedrock are management concerns for local roads and streets. The roads should be built on the contour or designed so that they conform to the natural slope of the land. Planning grades so that the removal of rock is not necessary and ripping the bedrock help to overcome the depth to bedrock.

This map unit is poorly suited for recreational uses. The slope, depth to bedrock, and small stones on the surface are management concerns.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the slope, rooting depth, depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass VIs.

VsE—Victory-Southgate complex, 20 to 40 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Victory and similar soils: 45 percent
Southgate and similar soils: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a dark surface layer
- Soils that have a gravelly, very gravelly, or stony surface layer

Typical Profile

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low to high
Natural fertility: Low to moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow to moderately deep rooting depth, the very low to low available water capacity, and the very stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low to low available water capacity, the shallow to moderately deep rooting depth, and the very stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock in the Southgate soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, depth to water, and droughtiness of the soil are management concerns.

This map unit is in capability subclass VIs.

VsF—Victory-Southgate complex, 40 to 70 percent slopes, very stony

Setting

Landform position: On summits and side slopes of volcanic hills and mountains
Shape of areas: Irregular
Size of areas: 4 to 300 acres

Composition

Victory and similar soils: 45 percent
Southgate and similar soils: 40 percent
Contrasting inclusions: 15 percent

Minor Components

Contrasting inclusions

- Cramer—soils that have a clayey subsoil
- Jealousy—soils that have a clayey subsoil
- Maho Bay—soils that have a loamy subsoil
- Parasol—very deep soils that have a fine-loamy subsoil

Similar inclusions

- Soils that have a dark surface layer
- Soils that have a gravelly, very gravelly, or stony surface layer

Typical Profile

Victory

Surface layer:
0 to 6 inches, brown loam

Subsurface layer:
6 to 11 inches, dark yellowish brown loam

Subsoil:
11 to 14 inches, dark yellowish brown very gravelly loam
14 to 20 inches, brown very gravelly loam

Substratum:
20 to 33 inches, very pale brown very gravelly loam

Bedrock:
33 to 50 inches, weathered igneous bedrock
50 to 60 inches, unweathered igneous bedrock

Southgate

Surface layer:
0 to 5 inches, brown gravelly loam

Subsoil:
5 to 10 inches, brown very gravelly loam

Bedrock:
10 to 17 inches, weathered igneous bedrock
17 to 60 inches, unweathered igneous bedrock

Soil Properties and Qualities

Victory

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Organic matter content: Moderately low to high
Natural fertility: Low to moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 20 to 40 inches
Root zone: 20 to 40 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Southgate

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Organic matter content: Low to moderate
Natural fertility: Moderate
Hazard of erosion: Severe
Seasonal high water table: More than 6 feet deep
Depth to bedrock: 10 to 20 inches
Root zone: 10 to 20 inches
Shrink-swell potential: Low
Salinity: Nonsaline
Flooding: None
Stoniness: Very stony

Use and Management

This map unit is used mainly as rangeland. A few areas are used for pasture, hay, or cultivated crops.

This map unit is unsuited to cultivated crops. The severe hazard of erosion, the slope, the high content of rock fragments, the shallow to moderately deep rooting depth, the very low to low available water capacity, and the very stony surface are severe limitations.

This map unit is unsuited to pasture and hay. The slope, the very low to low available water capacity, the shallow to moderately deep rooting depth, and the very stony surface are severe limitations. The range site condition of this map unit is poor because less than 25 percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.

This map unit is unsuited to most urban uses. The slope and the depth to bedrock in the Southgate soil are severe limitations.

This map unit is unsuited for recreational uses. The slope, depth to bedrock, and small stones on the surface are severe limitations.

This map unit is poorly suited to use as wildlife habitat. The depth to bedrock, the shallow rooting depth, depth to water, and droughtiness of the soils are management concerns.

This map unit is in capability subclass VIIs.

Use and Management of the Soils

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

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

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

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil (fig. 16).

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

In this section, the estimated yields of the main crops and pasture plants are listed for each soil, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from other Caribbean Islands 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 irrigation, 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, manures, or other suitable organic sources; and harvesting that ensures the smallest possible loss.

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

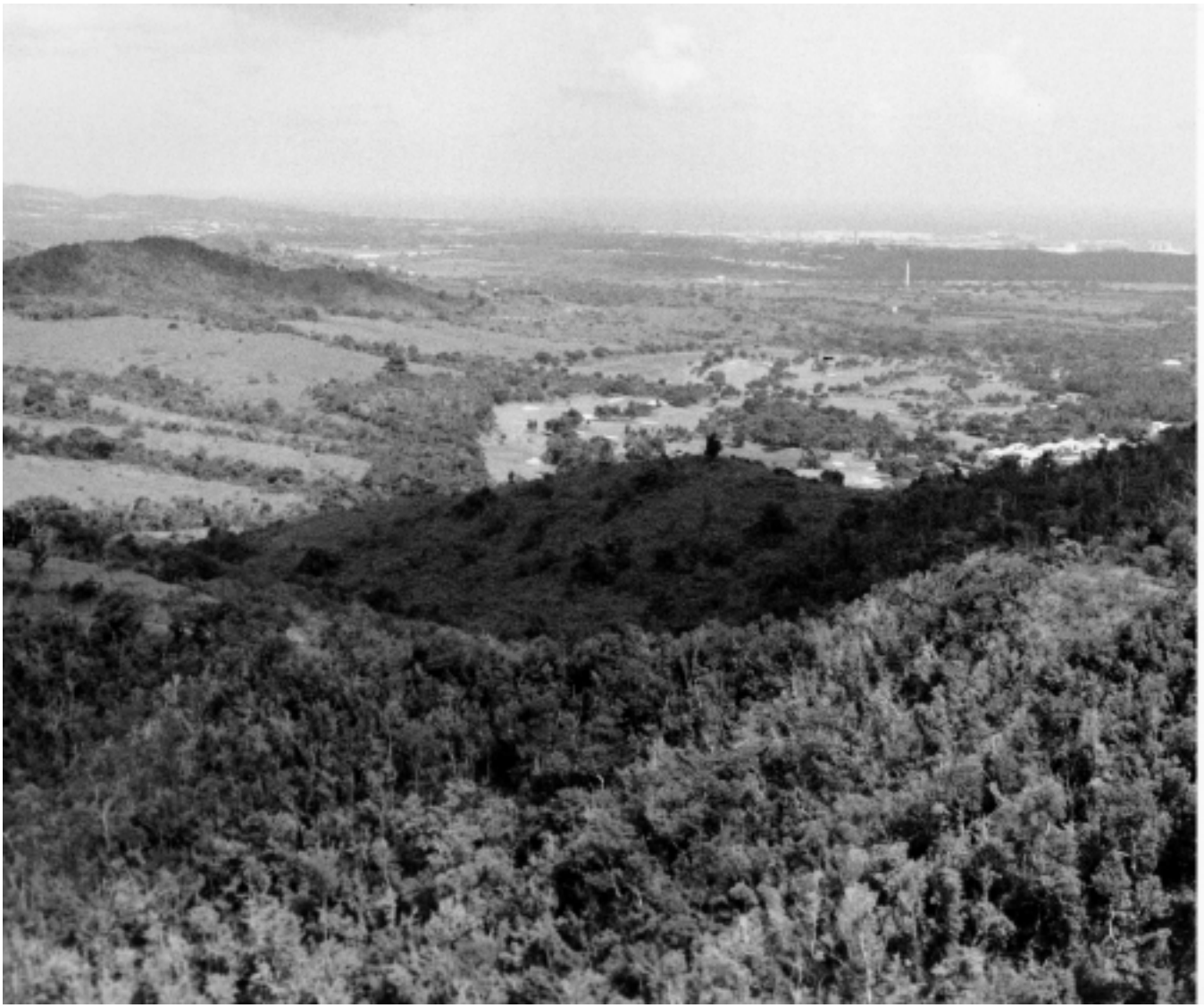


Figure 16.—A view facing south, towards the Hess Oil Refinery on St. Croix Island. The steep areas in the foreground are dominated by Annaberg and Cramer soils. The openland toe slope areas are dominated by Parasol soils. Hogensborg soils are dominant in the background.

with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, and for engineering purposes *(31, 33)*.

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 numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section “Detailed Soil Map Units” and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting 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 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 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, 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 12,000 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 was available.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. The soils on the list require measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

A range site is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Recreation

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation (fig. 17). The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Figure 17.—Water sports, such as boating and fishing, are prominent recreational activities in the United States Virgin Islands.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The suitability of the soil is indicated as *well suited, suited,* or *poorly suited.* A rating of *well suited* indicates that the soil has properties favorable for use, and the kind of habitat is easily established, improved, or

maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *suited* indicates that the soil is moderately favorable for use, and the kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poorly suited* indicates that the soil has limitations that are severe for the kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive.

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, and ponding. Soil temperature and soil moisture are also considerations.

Domestic grasses and legumes are 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, and ponding. Soil temperature and soil moisture are also considerations.

Upland 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 texture of the surface layer, available water capacity, wetness, salinity, and sodicity and soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are Mexican bluegrass, buffelgrass, bermudagrass, sprawling panicgrass, and pope head cactus.

Upland shrubs and vines are predominantly mesophytic and xerophytic plants and include some hydrophytic plants that are common in areas adjacent to riparian areas and wetlands. Soil properties and features that affect the growth of upland shrubs, vines, and trees are depth of the root zone, available water capacity, wetness, salinity, and sodicity. Examples of these plants are black olive, turpentine tree, west indiaelm, silk cotton tree, sweet acacia, leucaena, inkberry, and giant milk weed. Examples of upland plants that are suitable for planting on soils rated *good* are mango and papaya.

Fresh water wetland plants are plants that grow in moist or wet, nonsaline areas. There are no natural lakes or ponds in the survey area, and most stream channels are dry during most of the year. The main exception is the Kingshill Gut on the southern side of St. Croix. Examples of fresh water wetland plants are water lily, duckweed, and some grasses and sedges.

Saline wetland plants are wild herbaceous plants and shrubs 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, sodicity, and ponding. Examples of saline wetland plants are red, white, and black mangrove (fig. 18).

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 seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary

Figure 18.—Mangrove wetlands in an area of Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded, located north of Great Lameshur Bay on St. John Island.

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 *(29)*.

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 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome;

moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 10 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be

unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The

thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil

and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties were 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 were made and examined to identify and classify the soils and to delineate them on the soil maps. Samples were 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.

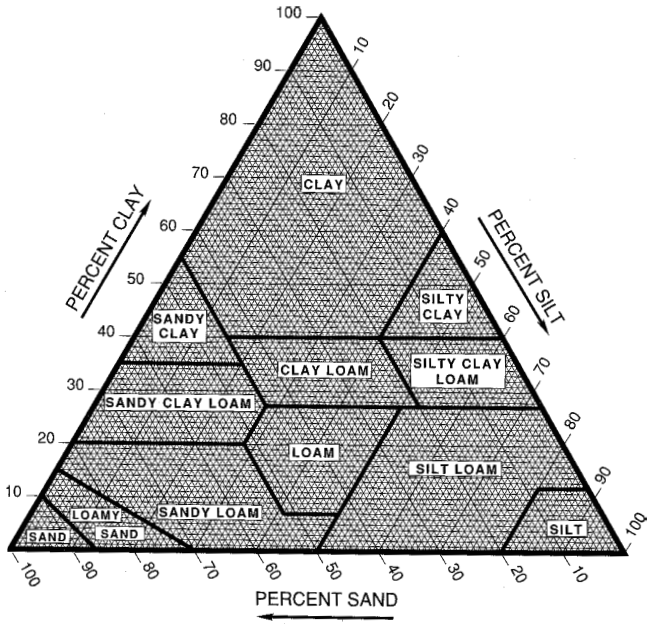


Figure 19.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 19). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and

maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for

fertility and stabilization, and in determining the risk of corrosion.

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*, greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist

mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table—that is, perched, apparent, or artesian; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. “More than 6.0” indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

A *cemented pan* is a cemented or indurated subsurface layer within a depth of 5 feet. Such a pan causes difficulty in excavation. Pans are classified as thin or thick. A thin pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A thick pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 16 and the results of chemical analysis in table 17. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the National Soil Survey Laboratory in Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(28)*.

Coarse materials—(2-75 mm fraction) weight estimates of the percentages of all material less than 75 mm (3B1).

Coarse materials—(2-250 mm fraction) volume estimates of the percentages of all material greater than 2 mm (3B2).

Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).

Carbonate clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1d).

Water retained—pressure extraction, percentage of ovendry weight of less than 2 mm material; 1/3 or 1/10 bar (4B1), 15 bars (4B2).

Water-retention difference—between 1/3 bar and 15 bars for whole soil (4C1).

Water-retention difference—between 1/10 bar and 15 bars for whole soil (4C2).

Bulk density—of less than 2 mm material, saran-coated clods field moist (4A1a), 1/3 bar (4A1d), ovendry (4A1h).

Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c).

Organic carbon—dry combustion (6A2d).

Extractable acidity—barium chloride-triethanolamine IV (6H5a).

Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).

Cation-exchange capacity—sum of cations (5A3a).

Effective cation-exchange capacity—sum of extractable cations plus aluminum (5A3b).

Aluminum—potassium chloride extraction (6G9).

Iron—acid oxalate extraction (6C9a).

Sesquioxides—dithionate-citrate extract; iron (6C2b), aluminum (6G7a), manganese (6D2a).

Carbonate as calcium carbonate—(fraction less than 2 mm) manometric (6E1g).

Carbonate as calcium carbonate—(fraction less than 20 mm) manometric (6E4).

Electrical conductivity—saturation extract (8A3a).

Sodium adsorption ratio (5E).

Extractable phosphorus—Bray P-1 (6S3).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(32, 34)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (*Ust*, meaning dryness, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustoll (*Hapl*, meaning minimal horizonation, plus *ustoll*, the suborder of the Mollisols that has an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplustolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, cation-exchange activity class, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, isohyperthermic Typic Haplustolls.

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 is the Cinnamon Bay series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(35)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(32)* and in "Keys to Soil Taxonomy" *(34)*. Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Annaberg Series

The Annaberg series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from extrusive igneous bedrock. Slopes range from 12 to 90 percent. Soils of the Annaberg series are loamy-skeletal, mixed, superactive, isohyperthermic Lithic Haplustolls.

Annaberg soils are commonly associated on the

Figure 20.—Profile of Annaberg gravelly loam, in an area of Annaberg-Maho Bay complex, 40 to 60 percent slopes, extremely stony. These shallow, well drained, skeletal soils are on summits and side slopes of volcanic hills and mountains throughout the United States Virgin Islands.

landscape with Cramer, Fredriksdal, Jealousy, Maho Bay, and Victory soils. All of these soils are in landscape positions similar to those of the Annaberg soils. Cramer soils are clayey. Fredriksdal soils are clayey-skeletal. Jealousy soils are moderately deep and clayey. Maho Bay soils are loamy. Victory soils are moderately deep over bedrock and do not have a mollic epipedon.

Typical pedon of Annaberg gravelly loam, in an area of Annaberg-Maho Bay complex, 40 to 60 percent slopes, extremely stony (fig. 20); on St. John Island, Leinster Bay, 0.1 mile southwest of the hill top ruins (about 0.2 mile from Leinster Point), or 0.1 mile northwest of the Leinster Bay Cemetery, 75 feet north of the Johnny Horn Trail, on a steep southwestern aspect.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) gravelly loam; moderate fine and medium granular structure; friable; many fine and medium and few coarse roots; about 35 percent, by volume, pebbles; neutral; clear smooth boundary.

A2—5 to 10 inches; dark brown (7.5YR 3/2) very gravelly loam; moderate medium granular structure; friable; common fine and medium roots; about 50 percent, by volume, pebbles; neutral; clear smooth boundary.

Cr—10 to 13 inches; 50 percent reddish yellow

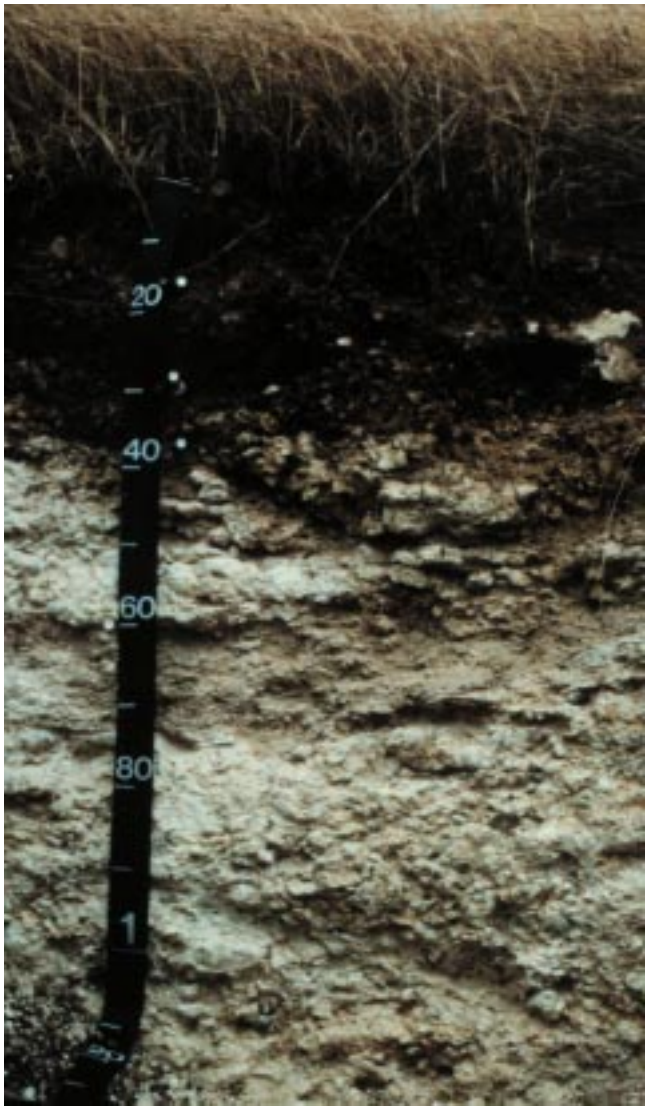


Figure 21.—Profile of Arawak gravelly loam, 20 to 40 percent slopes. The shallow, well drained, skeletal soils are on summits and side slopes of calcareous hills and mountains on St. Croix Island.

(7.5YR 6/8) and 50 percent yellow (10YR 7/8) weathered, fine-grained igneous bedrock; few fine roots; neutral; clear wavy boundary.
R—13 to 60 inches; 50 percent reddish yellow (7.5YR 6/8) and 50 percent yellow (10YR 7/8) unweathered, fine-grained igneous bedrock.

The depth to weathered bedrock ranges from 6 to 15 inches. The depth to unweathered bedrock ranges from 10 to 20 inches. Reaction ranges from strongly acid to neutral in the A horizon and from very strongly acid to slightly acid in the Cr horizon.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to more than 60 percent, by volume.

The Cr horizon is weathered igneous bedrock.

The R horizon is unweathered igneous bedrock.

Arawak Series

The Arawak series consists of shallow, well drained soils on summits and side slopes of limestone hills and mountains. These soils formed in material weathered from soft limestone bedrock. Slopes range from 2 to 70 percent. Soils of the Arawak series are loamy-skeletal, carbonatic, isohyperthermic, shallow Typic Haplustolls.

Arawak soils are commonly associated on the landscape with Glynn, Hesselberg, Hogensborg, and Sion soils. Glynn and Hogensborg soils are on alluvial fans and terraces. Glynn soils are very deep and are clayey-skeletal. Hogensborg soils are very deep and clayey. Hesselberg soils are on marine terraces and are clayey. Sion soils are on side slopes and valley floors. They are very deep and coarse-loamy.

Typical pedon of Arawak gravelly loam, 20 to 40 percent slopes, very stony (fig. 21), in the Constitution Hill area of St. Croix Island, from the intersection of the Virgin Islands Highways 708 and 811, about 0.1 mile northwest on Highway 811, about 0.1 mile east, on a side slope.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) gravelly loam; strong medium and coarse granular structure; friable; common fine and medium roots; about 30 percent, by volume, limestone pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.
A2—6 to 11 inches; very dark grayish brown (10YR 3/2) very gravelly loam; strong medium granular structure; very hard, very firm, sticky and plastic; common fine and medium roots; common fine and medium soft masses of calcium carbonate; about 50 percent, by volume, limestone pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
C—11 to 14 inches; pale brown (10YR 6/3) very gravelly loam; massive; friable; few fine and medium roots; common fine and medium soft masses of calcium carbonate; about 50 percent, by volume, limestone pebbles and cobbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
Cr1—14 to 23 inches; pale brown (10YR 6/3) and pinkish white (7.5YR 8/2) limestone; massive; extremely hard; few fine roots in fractures; strongly effervescent; moderately alkaline; diffuse wavy boundary.
Cr2—23 to 30 inches; pale brown (10YR 6/3) limestone; massive; friable; few fine roots; common fine and medium soft masses of calcium carbonate; strongly effervescent; moderately alkaline; diffuse wavy boundary.
Cr3—30 to 60 inches; pale brown (10YR 6/3) and pinkish white (7.5YR 8/2) limestone; massive; extremely hard; strongly effervescent; moderately alkaline.

The depth to limestone ranges from 10 to 20 inches. The rock fragments include gravel, cobbles, flags, and boulders that are composed of limestone or coral.

The A horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is clay loam or loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 60 percent, by volume.

The C horizon has hue of 7.5YR or 10YR, value of 3 to 8, and chroma of 1 to 4. Texture is loam or sandy loam in the fine-earth fraction. This horizon has few to many soft masses of calcium carbonate. The content of pebbles and cobbles ranges from 35 to 60 percent, by volume.

The Cr horizon is limestone. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 to 4 or has no dominant matrix color and is multicolored in shades of pink, white, and brown.

Carib Series

The Carib series consists of very deep, poorly drained soils on flood plains. These soils formed in alluvium from adjacent volcanic and limestone hills and mountains. Slopes range from 0 to 2 percent. Soils of the Carib series are fine-loamy, mixed, superactive, nonacid, isohyperthermic Mollic Endoaquepts.

Carib soils are commonly associated on the landscape with Glynn, Sandy Point, Solitude, and Sugar Beach soils. The well drained Glynn soils are on alluvial fans and terraces at higher elevations and are

clayey-skeletal. The very poorly drained Sandy Point and Sugar Beach soils are in adjacent saline marshes. Sugar Beach soils have a thick organic layer. Solitude soils are in slightly lower positions that are adjacent to saline marshes and flats.

Typical pedon of Carib clay loam, 0 to 2 percent slopes, frequently flooded, on St. Croix Island, from the intersection of Virgin Islands Highways 80 and 78, about 0.5 mile northeast on Highway 80 (Northshore Road), about 75 feet southeast of Virgin Islands Highway 80, on the flood plain.

A—0 to 8 inches; very dark grayish brown (2.5Y 3/2) clay loam; moderate fine and medium granular structure; friable; common fine and medium roots; common fine charcoal fragments; common medium calcium carbonate nodules; slightly effervescent; slightly alkaline; clear smooth boundary.

Bkg1—8 to 21 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common fine charcoal fragments; common medium calcium carbonate nodules; about 5 percent, by volume, pebbles; common medium iron-manganese concretions; few fine prominent yellowish red (5YR 5/8) masses of iron accumulation; common medium faint very dark grayish brown (2.5Y 3/2) and common medium distinct light gray (2.5Y 7/2) iron depletions; slightly effervescent; slightly alkaline; clear smooth boundary.

Bkg2—21 to 32 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common fine charcoal fragments; common medium calcium carbonate nodules; about 5 percent, by volume, pebbles; common medium iron-manganese concretions; few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation; common medium distinct light gray (2.5Y 7/2) iron depletions; slightly effervescent; slightly alkaline; clear smooth boundary.

Bkg3—32 to 45 inches; grayish brown (2.5Y 5/2) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; common medium charcoal fragments; common fine calcium carbonate nodules; about 10 percent, by volume, pebbles; common medium iron-manganese concretions; few fine distinct light yellowish brown (2.5Y 6/4) masses of iron accumulation; common medium faint light gray (2.5Y 7/2) iron depletions; slightly effervescent; slightly alkaline; clear smooth boundary.

BCkg—45 to 52 inches; dark grayish brown (2.5Y 4/2) clay loam; weak fine to medium subangular blocky structure; firm; common medium charcoal fragments; common fine calcium carbonate nodules; about 10 percent, by volume, pebbles; common medium iron-manganese concretions; common medium faint light yellowish brown (2.5Y 6/4) masses of iron accumulation; common medium distinct light gray (2.5Y 7/2) iron depletions; slightly effervescent; slightly alkaline; clear smooth boundary.

Cg—52 to 60 inches; grayish brown (2.5Y 5/2) clay loam; massive; firm; common fine calcium carbonate nodules; about 10 percent, by volume, pebbles; common fine iron-manganese concretions; common medium faint light yellowish brown (2.5Y 6/4) masses of iron accumulation; common medium distinct light gray (2.5Y 7/2) iron depletions; slightly effervescent; slightly alkaline.

The solum is 20 to 60 inches thick. The soils are nonsaline in the upper part and very slightly saline in the lower part. Reaction is neutral or slightly alkaline throughout the profile.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 2 or 3. Some pedons have few or common redoximorphic features in shades of brown. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Bkg horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 2 or less. It has few to many redoximorphic features in shades of brown, yellow, and gray. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The BCg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 or less. It has common or many redoximorphic features in shades of brown, yellow, and gray. Texture is clay loam, sandy clay loam, or sandy loam. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Cg horizon has hue of 2.5Y or 5Y, value of 4 to 7, and chroma of 2 or less. It has few to many redoximorphic features in shades of brown, yellow, and gray. Texture is clay loam, sandy loam, or sandy clay loam. The content of pebbles and cobbles ranges from 0 to 15 percent, by volume.

Cinnamon Bay Series

The Cinnamon Bay series consists of very deep, well drained soils on alluvial fans and terraces. These soils formed in alluvium derived from adjacent volcanic uplands. Slopes range from 0 to 12 percent. Soils of the Cinnamon Bay series are fine-loamy, mixed, active, isohyperthermic Typic Haplustolls.

Cinnamon Bay soils are commonly associated on the landscape with Lameshur, Sandy Point, Solitude, and Sugar Beach soils. The excessively drained Lameshur soils are in landscape positions similar to those of the Cinnamon Bay soils. They are loamy-skeletal. The very poorly drained Sandy Point and Sugar Beach soils are in adjacent saline marshes. Sandy Point soils do not have a mollic epipedon. Sugar Beach soils have a thick organic layer. The somewhat poorly drained Solitude soils are in lower positions. They do not have a mollic epipedon.

Typical pedon of Cinnamon Bay loam, 2 to 5 percent slopes, occasionally flooded, on St. John Island, 80 feet northeast of the Salt Pond border, about 50 feet down a small trail in the bottomland forest, about 0.75 mile west of Minna Hill and 1.0 mile south-southeast of Bordeaux Mountain.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) loam; moderate medium granular structure; friable; few fine medium and coarse roots; common fine and medium interstitial pores; common medium wormcasts; about 5 percent, by volume, pebbles; moderately acid; clear smooth boundary.

A2—3 to 11 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; friable; common fine roots; many very fine and fine interstitial pores; common medium wormcasts; about 5 percent, by volume, pebbles; slightly acid; clear smooth boundary.

Bw—11 to 21 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse subangular blocky structure; friable; few very fine, fine, and coarse roots; many very fine and fine tubular pores; common medium wormcasts; few faint dark brown (10YR 4/3) organic stains on faces of peds; about 5 percent, by volume, pebbles; neutral; clear smooth boundary.

C1—21 to 31 inches; dark yellowish brown (10YR 4/4) sandy loam; massive, very friable; few medium roots; many very fine and fine tubular pores; common medium wormcasts; 10 percent, by volume, pebbles; neutral; clear smooth boundary.

C2—31 to 47 inches; pale brown (10YR 6/3) sandy clay loam; massive; friable; many fine and very fine tubular pores; common medium wormcasts; about 10 percent, by volume, pebbles; slightly alkaline; clear smooth boundary.

C3—47 to 57 inches; dark yellowish brown (10YR 4/4) sandy clay loam; massive; friable; many very fine and fine tubular pores; common medium wormcasts; about 10 percent, by volume, pebbles; slightly alkaline; clear smooth boundary.

C4—57 to 60 inches; brown (7.5YR 4/4) sandy clay loam; massive; friable; many very fine and fine tubular pores; common medium wormcasts; about 10 percent, by volume, pebbles; slightly alkaline.

The thickness of the solum ranges from 20 to 60 inches or more. Reaction ranges from moderately acid to slightly alkaline throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Some pedons have few or common redoximorphic features in shades of brown and yellow. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 or 4. Some pedons have few or common redoximorphic features in shades of brown and yellow. Texture is sandy loam or sandy clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

Cramer Series

The Cramer series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from extrusive igneous bedrock. Slopes range from 2 to 90 percent. Soils of the Cramer series are clayey, mixed, active, isohyperthermic, shallow Typic Haplustolls.

Cramer soils are commonly associated on the landscape with Annaberg, Dorothea, Fredriksdal, Maho Bay, Southgate, Susannaberg, and Victory soils. All of these soils are in landscape positions similar to those of the Cramer soils. Annaberg soils are loamy-skeletal. Dorothea soils are very deep and do not have a mollic epipedon. Fredriksdal soils are clayey-skeletal. Maho Bay soils are loamy. Susannaberg soils are clayey. Southgate and Victory soils are loamy-skeletal and do not have a mollic epipedon.

Typical pedon of Cramer gravelly clay loam, in an area of Annaberg-Cramer complex, 40 to 60 percent slopes, extremely stony; on St. Croix Island, about 1.8 miles northwest of the Annaly intersection of Virgin Islands Highways 63 and 78, 100 feet north of Highway 63 (Scenic Road), on the south aspect. Site is about 1.3 miles northeast of the Hams Bay Gut Quarry on Highway 63.

A—0 to 9 inches; dark reddish brown (5YR 3/3) gravelly clay loam; moderate fine and medium granular structure; firm, slightly sticky and slightly plastic; common fine and medium and few coarse

roots; common medium interstitial pores; many medium wormcasts; about 30 percent, by volume, pebbles; neutral; clear smooth boundary.
Bw1—9 to 14 inches; dark red (2.5YR 3/6) gravelly clay; moderate fine and medium subangular blocky structure; firm, sticky and plastic; common fine medium and coarse roots; common very fine and fine tubular pores; many medium wormcasts; about 30 percent, by volume, pebbles; slightly acid; clear smooth boundary.
Bw2—14 to 19 inches; dark reddish brown (2.5YR 3/4) gravelly clay; moderate fine and medium subangular blocky structure; firm, sticky and plastic; common fine medium and coarse roots; many fine and medium tubular pores; many medium wormcasts; about 20 percent, by volume, pebbles; moderately acid; abrupt wavy boundary.
Cr—19 to 32 inches; dark reddish brown (2.5YR 3/4) weathered igneous bedrock; common fine roots; abrupt wavy boundary.
R—32 to 60 inches; dark reddish brown (2.5YR 3/4) unweathered igneous bedrock.

The depth to weathered bedrock ranges from 10 to 20 inches. The depth to unweathered bedrock ranges from 15 to 35 inches. Reaction is slightly acid or neutral in the A horizon and moderately acid or slightly acid in the Bw horizon.

The A horizon has hue of 2.5YR or 5YR, value of 2 or 3, and chroma of 2 or 3. Some pedons have few or common mottles in shades of brown. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 60 percent, by volume.

The Bw horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 3 to 8. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 10 to 30 percent, by volume.

The Cr horizon is composed of weathered igneous bedrock.

The R horizon is composed of unweathered igneous bedrock.

Dorothea Series

The Dorothea series consists of very deep, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from igneous bedrock. Slopes range from 20 to 90 percent. Soils of the Dorothea series are fine, vermiculitic, isohyperthermic Typic Haplustalfs.

Dorothea soils are commonly associated on the landscape with Cramer, Fredriksdal, Maho Bay, Southgate, Susannaberg, and Victory soils. Cramer, Fredriksdal, Maho Bay, and Susannaberg soils are shallow and have mollic epipedons. Southgate soils are shallow and loamy-skeletal. Victory soils are moderately deep and loamy-skeletal.

Typical pedon of Dorothea clay loam, in an area of Dorothea-Susannaberg complex, 40 to 60 percent slopes, extremely stony; on St. Thomas Island, about 1,000 feet west of the intersection of Virgin Islands Highways 33 and 40 (Liliendal Junction), on Highway 33 about 75 feet south of the highway.

A—0 to 6 inches; dark brown (10YR 4/3) clay loam; moderate medium and coarse granular structure; friable, slightly plastic; many fine and medium and few coarse roots; many medium and coarse interstitial pores; many medium and coarse wormcasts; about 5 percent, by volume, gravel; slightly acid; clear smooth boundary.
Bt1—6 to 11 inches; brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm, slightly sticky and moderately plastic; common fine and medium roots; many fine and medium vesicular and tubular pores; few fine and medium wormcasts; few fine faint clay films on faces of peds; few pressure faces on vertical and horizontal faces of peds; about 5 percent, by volume, pebbles; slightly acid; clear smooth boundary.
Bt2—11 to 19 inches; yellowish brown (10YR 5/6) clay; moderate medium and coarse subangular blocky structure; very firm, slightly sticky and moderately plastic; common very fine and fine roots; few fine wormcasts; few fine faint clay films on faces of peds; few pressure faces on vertical and horizontal faces of peds; about 5 percent, by volume, pebbles; slightly acid; clear smooth boundary.
B/C—19 to 30 inches; strong brown (7.5YR 5/6) clay loam; weak medium and coarse subangular blocky structure; firm, slightly sticky and slightly plastic; few very fine and fine roots; about 25 percent, by volume, saprolite; about 10 percent, by volume, pebbles; few fine iron-manganese concretions; slightly acid; clear smooth boundary.
C—30 to 60 inches; strong brown (7.5YR 5/6) saprolite that has a clay loam texture; massive; friable, slightly sticky and slightly plastic; about 10 percent, by volume, pebbles; slightly acid.

The thickness of the solum ranges from 24 to more than 60 inches. Reaction ranges from slightly acid to neutral throughout the profile.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Bt horizon has hue of 7.5YR or 10YR, value of

4 to 6, and chroma of 4 to 8. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The B/C horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 8. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of saprolite ranges from 20 to 40 percent, by volume. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The C horizon is saprolite. It has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

Fredriksdal Series

The Fredriksdal series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from extrusive igneous bedrock. Slopes range from 12 to 90 percent. Soils of the Fredriksdal series are clayey-skeletal, vermiculitic, isohyperthermic Lithic Haplustolls.

Fredriksdal soils are commonly associated on the landscape with Annaberg, Cramer, Dorothea, Maho Bay, Susannaberg, and Victory soils. These soils are in landscape positions similar to those of the Fredriksdal soils. Annaberg soils are loamy-skeletal. Cramer and Susannaberg soils are clayey. Dorothea soils are very deep and do not have a mollic epipedon. Maho Bay soils are loamy. Victory soils are moderately deep and are loamy-skeletal.

Typical pedon of Fredriksdal very gravelly clay loam, in an area of Fredriksdal-Susannaberg complex, 40 to 60 percent slopes, extremely stony; on St. John Island, about 0.8 mile from Gift Hill summit, on a compass bearing of 70 degrees to the eastern aspect of a very steeply sloping mountainside overlooking Fish Bay Gut.

A—0 to 7 inches; dark reddish brown (5YR 3/3) very gravelly clay loam; moderate medium and coarse granular structure; firm; many fine, common medium, and few coarse roots; common very fine interstitial pores; about 40 percent, by volume, pebbles, cobbles, and stones; neutral; clear smooth boundary.

Bw—7 to 12 inches; reddish brown (5YR 4/3) very gravelly clay loam; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; about 5 percent, by volume, flagstones; about 50 percent, by volume, pebbles; common medium faint reddish brown (5YR 4/4) masses of iron accumulation; neutral; gradual smooth boundary.

Cr—12 to 16 inches; yellowish red (5YR 4/6) weathered igneous bedrock; few fine roots; clear smooth boundary.

R—16 to 60 inches; unweathered igneous bedrock.

The depth to weathered and unweathered igneous bedrock ranges from 10 to 20 inches. Reaction ranges from slightly acid to neutral throughout the profile. The weighted average of pebbles in the particle-size control section is more than 35 percent, by volume.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. Texture is loam, clay loam, or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 60 percent, by volume.

The Bw horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 2 to 4. Some pedons have few or common redoximorphic features in shades of brown. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles, cobbles, and flagstones ranges from 35 to more than 60 percent, by volume.

The Cr horizon is composed of weathered igneous bedrock.

The R horizon is composed of unweathered igneous bedrock.

Glynn Series

The Glynn series consists of very deep, well drained soils on alluvial fans and terraces. These soils formed in stratified alluvial sediments weathered from basic igneous rock. Slopes range from 0 to 12 percent. Soils of the Glynn series are clayey-skeletal, mixed, superactive, isohyperthermic Typic Argiustolls.

Glynn soils are commonly associated on the landscape with Arawak, Carib, Hesselberg, Lameshur, Sandy Point, Sion, Solitude and Sugar Beach soils. Arawak soils are in higher landscape positions than the Glynn soils. They are shallow and loamy-skeletal. The somewhat poorly drained Carib soils are on flood plains and are fine-loamy. Hesselberg soils are on marine terraces. They are shallow and clayey. The excessively drained Lameshur soils are in landscape positions similar to those of the Glynn soils. They are loamy-skeletal. The very poorly drained Sandy Point and Sugar Beach soils are in saline marshes and flats. Sion soils are on side slopes and valley floors. They are coarse-loamy. The somewhat poorly drained Solitude soils are in lower positions than the Glynn soils. They are fine-loamy.

Figure 22.—Profile of Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded. These very deep, well drained soils are on alluvial fans and terraces of St. Croix Island.

Typical pedon of Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded (fig. 22), on St. Croix Island, about 0.3 mile south of Petronella on Virgin Islands Highway 62, about 200 feet east of Highway 62, in a pasture.

A1—0 to 4 inches; dark brown (10YR 3/3) gravelly loam; moderate medium and coarse granular structure; friable; many fine and medium and few coarse roots; many fine to coarse wormcasts and insectcasts; about 30 percent, by volume, pebbles; neutral; clear wavy boundary.

A2—4 to 10 inches; dark brown (10YR 3/3) gravelly clay loam; moderate medium and coarse granular structure; friable, sticky and plastic; many fine and medium and few coarse roots; many fine to coarse wormcasts; many fine and medium insectcasts; about 30 percent, by volume, pebbles; few fine and medium faint yellowish brown (10YR 5/6) masses of iron accumulation; neutral; abrupt smooth boundary.

Bt—10 to 17 inches; dark yellowish brown (10YR 4/4) very gravelly clay; strong medium prismatic structure; slightly hard, firm, very sticky and plastic; common fine and medium and few coarse roots; common fine medium and coarse wormcasts; common medium insectcasts; few fine faint clay films on faces of peds; about 35 percent, by volume, pebbles; few fine and medium faint yellowish brown (10YR 5/6) masses of iron accumulation; slightly alkaline; gradual wavy boundary.

BC—17 to 27 inches; yellowish brown (10YR 5/4) very gravelly clay loam; weak fine and medium prismatic structure; firm, very sticky and plastic; few fine and medium roots; common fine and medium wormcasts; common fine insectcasts; few faint clay films on faces of some peds; about 35 percent, by volume, pebbles; many fine and medium iron-manganese concretions; common fine distinct strong brown (7.5YR 5/6) and few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; moderately alkaline; gradual wavy boundary.

C—27 to 32 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam; massive; friable, slightly sticky and slightly plastic; few medium roots; common fine and medium wormcasts; common fine insectcasts; about 35 percent, by volume, pebbles; few fine distinct strong brown (7.5YR 5/6) and few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; strongly alkaline; clear wavy boundary.

2C—32 to 41 inches; light olive brown (2.5Y 5/4) very gravelly clay; massive; firm, very sticky and very plastic; few fine and medium roots; common pressure faces on vertical and horizontal faces of peds; many medium and coarse soft masses of calcium carbonate; common fine and medium wormcasts; about 50 percent, by volume, pebbles; many fine and medium iron-manganese concretions; few fine distinct brownish yellow (10YR 6/8) and common fine and medium distinct light yellowish brown (2.5Y 6/4) masses of iron accumulation; few medium distinct very pale brown (10YR 8/3) iron depletions; strongly alkaline; gradual wavy boundary.

3C—41 to 60 inches; light olive brown (2.5Y 5/4) very gravelly sandy clay loam; massive; friable, slightly sticky and slightly plastic; few fine and medium

roots; many medium and coarse soft masses of calcium carbonate; common fine and medium wormcasts; about 40 percent, by volume, pebbles; many fine and medium iron-manganese concretions; few fine distinct brownish yellow (10YR 6/8) masses of iron accumulation; common medium distinct pale brown (10YR 8/3) iron depletions; strongly alkaline.

The thickness of the solum ranges from 20 to 60 inches or more. Reaction ranges from neutral to strongly alkaline throughout the profile.

The A horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 2 or 3. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 5 to 60 percent, by volume.

The Bt horizon has hue of 5YR to 5Y, value of 3 to 7, and chroma of 3 to 6. Some pedons have few redoximorphic features in shades of brown and yellow. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 60 percent, by volume.

The BC horizon has hue of 5YR to 2.5Y, value of 3 to 7, and chroma of 3 to 6. Some pedons have few or common redoximorphic features in shades of brown and yellow. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 60 percent, by volume.

The C horizon has hue of 5YR to 2.5Y, value of 4 to 8, and chroma of 2 to 8. Some pedons have few or common redoximorphic features in shades of brown and yellow. Texture is sandy clay loam, clay loam, or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 60 percent, by volume. This horizon has few to many soft masses of calcium carbonate.

Hesselberg Series

The Hesselberg series consists of shallow, well drained soils on marine terraces. These soils formed in alkaline, clayey sediments. Slopes range from 0 to 12 percent. Soils of the Hesselberg series are clayey, mixed, superactive, isohyperthermic, shallow Petrocalcic Paleustolls.

Hesselberg soils are commonly associated on the landscape with Arawak, Glynn, Hogensborg, and Sion soils. Arawak soils are in higher positions than the Hesselberg soils. They are loamy-skeletal. Glynn and Hogensborg soils are on alluvial fans and terraces. They are very deep. Glynn soils are clayey-skeletal. Hogensborg soils are clayey. Sion soils are on side slopes and valley floors. They are very deep and are coarse-loamy.

Typical pedon of Hesselberg clay, 0 to 2 percent slopes, on St. Croix Island, from Alexander Hamilton Airport terminal about 0.5 mile west on Virgin Islands Highway 64, about 0.1 mile southeast on an unimproved lane, 50 feet west of the lane, in a wooded area.

A1—0 to 7 inches; dark reddish brown (5YR 3/3) clay; strong fine and medium granular structure; firm, slightly sticky and slightly plastic; many fine and medium roots; about 5 percent, by volume, pebbles; slightly effervescent; slightly alkaline; clear smooth boundary.

A2—7 to 12 inches; dark reddish brown (5YR 3/3) clay; strong fine and medium granular structure; firm, slightly sticky and plastic; many fine roots; about 10 percent, by volume, pebbles; slightly effervescent; slightly alkaline; clear smooth boundary.

Bk—12 to 17 inches; dark red (2.5YR 3/6) gravelly clay; weak fine and medium prismatic structure; firm, slightly sticky and plastic; common fine roots; few medium wormcasts; common filaments of calcium carbonate; about 30 percent, by volume, pebbles; slightly effervescent; slightly alkaline; abrupt wavy boundary.

Bkm1—17 to 18 inches; reddish yellow (7.5YR 6/6), pinkish white (7.5YR 8/2), and very pale brown (10YR 8/4) partly silicified marl; massive; extremely hard; strongly effervescent; moderately alkaline; clear wavy boundary.

Bkm2—18 to 24 inches; white (7.5YR 8/1) partly silicified marl; massive; extremely hard; strongly effervescent; moderately alkaline; clear wavy boundary.

2C—24 to 60 inches; very pale brown (10YR 8/3) gravelly sandy loam; massive; friable; many fine and medium distinct nodules of calcium carbonate; about 20 percent, by volume, pebbles; strongly effervescent; moderately alkaline.

The depth to a petrocalcic horizon is 10 to 20 inches. Reaction is slightly alkaline or moderately alkaline in the A and B horizons and moderately alkaline in the C horizon.

The A horizon has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 2 or 3. The content of pebbles and cobbles ranges from 0 to 15 percent, by volume.

The Bk horizon has hue of 10R to 7.5YR, value of 3 or 4, and chroma of 3 to 6. The content of pebbles and cobbles ranges from 10 to 30 percent, by volume. This horizon has few to many calcium carbonate masses, nodules, concretions, or filaments.

The Bkm horizon is extremely hard, silicified marl.

The C or 2C horizon has hue of 5YR to 2.5Y, value of 4 to 8, and chroma of 1 to 8. Some pedons have few

to many mottles in shades of white, yellow, and brown. Texture is sandy loam, loam, or sandy clay loam in the fine-earth fraction. Calcium carbonate masses, nodules, filaments, or concretions range from few to many. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

Hogensborg Series

The Hogensborg series consists of very deep, well drained soils on alluvial fans and terraces. These soils formed in clayey sediments weathered from igneous rock. Slopes range from 0 to 12 percent. The soils of the Hogensborg series are fine, smectitic, isohyperthermic Sodic Haplusterts.

Hogensborg soils are commonly associated with Arawak, Hesselberg, and Sion soils. Arawak soils are in higher positions. They are shallow and are loamy-skeletal. Hesselberg soils are on marine terraces and are shallow over a petrocalcic horizon. Sion soils are on side slopes and valley floors and are coarse-loamy.

Typical pedon of Hogensborg clay loam, 2 to 5 percent slopes, rarely flooded, on St. Croix Island, about 0.5 mile east of St. Luke's Church (Grove Place), about 300 feet southeast, in a pasture.

A—0 to 6 inches; very dark grayish brown (2.5Y 3/2) clay loam; moderate fine and medium granular structure; firm, sticky and plastic; many fine and medium and few coarse roots; many medium and coarse wormcasts and insectcasts; about 5 percent, by volume, pebbles; slightly alkaline; clear smooth boundary.

AB—6 to 13 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate fine and medium subangular blocky structure; firm, sticky and plastic; many fine and medium and few coarse roots; common pressure faces on peds; many medium and coarse wormcasts and insectcasts; about 5 percent, by volume, pebbles; slightly alkaline; clear wavy boundary.

Bss1—13 to 23 inches; light olive brown (2.5Y 5/4) clay; strong medium and coarse prismatic structure; very firm, sticky and plastic; common fine and medium roots that are flattened on primary surfaces; common large intersecting slickensides that have distinct polished and grooved surfaces; common fine and medium wormcasts; about 5 percent, by volume, pebbles; common fine and medium concretions of iron-manganese; slightly effervescent; moderately alkaline; clear wavy boundary.

Bss2—23 to 31 inches; light olive brown (2.5Y 5/4) clay; strong coarse prismatic structure; very firm, sticky and plastic; few fine and medium roots that are flattened on primary surfaces; few large intersecting slickensides that have distinct polished and grooved surfaces; few fine and medium wormcasts; about 5 percent, by volume, pebbles; common fine and medium concretions of iron and manganese; few fine faint yellowish brown (10YR 5/8) masses of iron accumulation; strongly effervescent; moderately alkaline; clear wavy boundary.

Bkss1—31 to 43 inches; light olive brown (2.5Y 5/4) clay; strong medium and coarse prismatic structure; very firm, sticky and plastic; few fine and medium roots that are flattened on primary surfaces; few large intersecting slickensides that have distinct polished and grooved surfaces; about 5 percent, by volume, pebbles; many fine and medium nodules of calcium carbonate; few fine and medium wormcasts; many fine and medium concretions of iron-manganese; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; strongly effervescent; moderately alkaline; abrupt wavy boundary.

Bkss2—43 to 62 inches; light olive brown (2.5Y 5/4) clay; strong medium and coarse prismatic structure; very firm, sticky and plastic; few fine and medium roots that are flattened on primary surfaces; few large intersecting slickensides that have distinct polished and grooved surfaces; about 5 percent, by volume, pebbles; many fine and medium nodules of calcium carbonate; few fine and medium wormcasts; common fine and medium concretions of iron-manganese; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C—62 to 76 inches; strong brown (7.5YR 5/8) gravelly clay loam; massive; firm, slightly sticky and slightly plastic; few fine roots; common medium and coarse wormcasts; about 15 percent, by volume, pebbles; many medium and coarse concretions of iron-manganese; few fine distinct brownish yellow (10YR 6/6) masses of iron accumulation; strongly effervescent; moderately alkaline; abrupt wavy boundary.

3C—76 to 88 inches; strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; about 10 percent, by volume, pebbles; few medium and coarse concretions of iron and manganese; strongly effervescent; moderately alkaline.

The thickness of the solum is more than 60 inches. Reaction ranges from slightly acid to moderately

alkaline throughout the profile. The soils are very slightly saline.

The A horizon has hue of 10YR to 2.5Y, value of 2 to 5, and chroma of 1 to 4. Texture is clay loam or clay. The content of pebbles ranges from 0 to 30 percent, by volume.

The AB horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. Texture is clay loam or clay. The content of pebbles ranges from 0 to 30 percent, by volume.

The Bss horizon has hue of 10YR to 5Y, value of 3 to 8, and chroma of 2 to 8. Some pedons have few redoximorphic features in shades of brown and yellow. The content of pebbles ranges from 0 to 30 percent, by volume.

The Bkss horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 6. Some pedons have few redoximorphic features in shades of brown and yellow. The content of pebbles ranges from 0 to 30 percent, by volume. This horizon has few to many nodules of calcium carbonate.

The C or 2C horizon has hue of 5YR to 5Y, value of 4 to 8, and chroma of 2 to 8. It has few to many redoximorphic features in shades of brown and yellow. Texture is clay loam or clay. The content of pebbles ranges from 0 to 30 percent, by volume. Some pedons have few or common masses of calcium carbonate.

Jaucas Series

The Jaucas series consists of very deep, excessively drained soils on vegetated beaches along the sea coast. These soils formed in deposits of calcareous sand. Slopes range from 0 to 15 percent. Soils of the Jaucas series are carbonatic, isohyperthermic Typic Ustipsamments.

Jaucas soils are commonly associated on the landscape with Redhook, Sandy Point, Solitude, and Sugar Beach soils. Redhook soils are in landscape positions similar to those of the Jaucas soils. They are sandy-skeletal. The very poorly drained Sandy Point and Sugar Beach soils are in adjacent saline marshes. The somewhat poorly drained Solitude soils are in lower positions adjacent to saline marshes and flats.

Typical pedon of Jaucas sand, 0 to 5 percent slopes, rarely flooded, on Sandy Point on St. Croix, about 200 feet north of the sea.

A—0 to 6 inches; grayish brown (10YR 5/2) sand; single grained; loose; common fine and few coarse roots; about 5 percent, by volume, shell and coral pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.

C1—6 to 16 inches; light brownish gray (10YR 6/2) sand; single grained; loose; common fine roots; about 5 percent, by volume, shell and coral pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—16 to 26 inches; pale brown (10YR 6/3) sand; single grained; loose; few fine roots; about 10 percent, by volume, shell and coral pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.

C3—26 to 60 inches; very pale brown (10YR 7/3) sand; single grained; loose; about 10 percent, by volume, shell and coral pebbles; strongly effervescent; moderately alkaline.

The soils are moderately alkaline and moderately saline throughout the profile.

The A horizon has hue of 10YR, value of 4 to 8, and chroma of 2 or 3. The content of shell and coral pebbles ranges from 0 to 30 percent, by volume.

The AC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 1 to 3. The content of shell and coral pebbles ranges from 0 to 30 percent, by volume.

The C horizon has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 1 to 3. The content of shell and coral pebbles ranges from 0 to 30 percent, by volume.

Jealousy Series

The Jealousy series consists of moderately deep, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from plutonic bedrock. Slopes range from 12 to 70 percent. Soils of the Jealousy series are fine, smectitic, isohyperthermic Typic Haplustolls.

Jealousy soils are commonly associated on the slopes with Annaberg, Parasol, Southgate, and Victory soils. Annaberg, Southgate, and Victory soils are in landscape positions similar to those of the Jealousy soils. Annaberg and Southgate soils are shallow over bedrock and are loamy-skeletal. Victory soils are moderately deep and are loamy-skeletal. Parasol soils are in slightly lower landscape positions. They are very deep.

Typical pedon of Jealousy gravelly clay loam, in an area of Jealousy-Southgate complex, 40 to 70 percent slopes; on St. Croix Island, northeast from River on Virgin Island Highway 69, about 0.4 mile to a 90-degree northwest bend in the highway, about 0.3 mile northwest, about 800 feet northeast on a side slope.

A1—0 to 9 inches; very dark brown (10YR 2/2) gravelly clay loam; strong fine and medium granular structure; firm, moderately sticky and moderately plastic; many fine and medium and few coarse

roots; many medium and coarse interstitial pores; many medium and coarse wormcasts and insectcasts; about 30 percent, by volume, pebbles; neutral; gradual smooth boundary.

A2—9 to 15 inches; very dark brown (10YR 2/2) gravelly clay loam; strong fine and medium granular structure; firm, moderately sticky and moderately plastic; common fine and medium roots; many medium and coarse interstitial pores; many medium and coarse wormcasts and insectcasts; about 20 percent, by volume, pebbles; neutral; gradual smooth boundary.

Bw—15 to 26 inches; dark yellowish brown (10YR 3/4) gravelly clay loam; moderate medium subangular blocky structure; firm, moderately sticky and moderately plastic; common fine and medium roots; few pressure faces on horizontal and vertical ped faces; common medium vesicular and tubular pores; few fine and medium wormcasts; 20 percent, by volume, pebbles; neutral; gradual wavy boundary.

C—26 to 38 inches; very dark grayish brown (10YR 3/2) gravelly clay loam; massive; firm; few fine roots; few fine mica flakes; about 20 percent, by volume, pebbles; common fine and medium distinct strong brown (10YR 5/8) masses of iron accumulation; neutral; clear wavy boundary.

Cr—38 to 60 inches; very dark grayish brown (10YR 3/2) weathered igneous bedrock.

The thickness of the solum and depth to a paralithic contact range from 24 to 40 inches. Reaction ranges from moderately acid to neutral in the A horizon and is neutral or slightly alkaline in the Bw and C horizons.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume. Some pedons have a thin AB horizon.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 8. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume.

The Cr horizon is weathered, basic igneous bedrock.

Lameshur Series

The Lameshur series consists of very deep, excessively drained soils on alluvial fans and terraces. These soils formed in alluvium weathered from adjacent volcanic uplands. Slopes range from 2 to 12 percent. Soils of the Lameshur series are loamy-skeletal, mixed, active, isohyperthermic Typic Ustorthents.

Lameshur soils are commonly associated on the landscape with Cinnamon Bay, Glynn, Solitude, and Sugar Beach soils. The well drained Cinnamon Bay and Glynn soils are in landscape positions similar to those of the Lameshur soils. They have a mollic epipedon. The somewhat poorly drained Solitude soils are in areas adjacent to saline marshes. They are fine-loamy. The very poorly drained Sugar Beach soils are in saline marshes. They have thick organic layers.

Typical pedon of Lameshur gravelly sandy loam, 2 to 12 percent slopes, rubbly, occasionally flooded, on Reef Bay on St. John, about 1.1 miles south on Reef Bay Trail from the intersection of Reef Bay Trail and Center Line Road, on an eroded gut bank, about 30 feet east of Reef Bay Trail.

A—0 to 6 inches; brown (7.5YR 4/2) gravelly sandy loam; weak fine granular structure; very friable; common very fine and fine and few medium roots; common fine and medium interstitial pores; common medium wormcasts; about 25 percent, by volume, pebbles; neutral; abrupt smooth boundary.

C1—6 to 10 inches; brown (7.5YR 5/4) very gravelly loamy sand; massive; very friable; few medium and common fine roots; common very fine and fine tubular pores; about 50 percent, by volume, pebbles; neutral; clear smooth boundary.

C2—10 to 18 inches; light brown (7.5YR 6/4) extremely gravelly loamy sand; massive; very friable; few fine and very fine tubular pores; about 65 percent, by volume, pebbles; neutral; clear smooth boundary.

C3—18 to 35 inches; strong brown (7.5YR 5/6) extremely stony sandy clay loam; massive; very friable; about 20 percent, by volume, pebbles and 50 percent, by volume, cobbles and stones; common medium faint strong brown (7.5YR 4/6) and few fine faint light brown (7.5YR 6/4) masses of iron accumulation; neutral; clear smooth boundary.

C4—35 to 60 inches; yellowish red (5YR 4/6) extremely stony loamy sand; massive; very friable; about 10 percent, by volume, pebbles and 70 percent, by volume, cobbles and stones; few medium faint yellowish red (5YR 5/6) and strong brown (7.5YR 4/6) masses of iron accumulation; neutral.

The thickness of the solum ranges from 7 to 20 inches or more. Reaction ranges from moderately acid to neutral in the A horizon and slightly acid to neutral in the C horizons.

The A horizon has hue of 7.5YR or 10YR, value of 3

to 5, and chroma of 2 or 3. The texture is sandy loam, loam, or clay loam in the fine-earth fraction. The content of pebbles ranges from 15 to 35 percent, by volume.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have few to common redoximorphic features in shades of yellow and brown. Texture is loamy sand, sandy loam, loam, or sandy clay loam in the fine-earth fraction. The content of pebbles, cobbles, and stones ranges from 35 to more than 80 percent, by volume.

Maho Bay Series

The Maho Bay series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from extrusive igneous bedrock. Slopes range from 12 to 90 percent. Soils of the Maho Bay series are loamy, mixed, superactive, isohyperthermic, shallow Typic Haplustolls.

Maho Bay soils are commonly associated on the landscape with Annaberg, Cramer, Dorothea, Fredriksdal, Southgate, Susannaberg, and Victory soils. All of these soils are in landscape positions similar to those of the Maho Bay soils. Annaberg soils are loamy-skeletal. Cramer and Susannaberg soils are clayey. Dorothea soils are very deep and have vermiculitic clay mineralogy. Fredriksdal soils are clayey-skeletal. Southgate soils are loamy-skeletal. Victory soils are moderately deep over bedrock and do not have a mollic epipedon.

Typical pedon of Maho Bay gravelly loam, in an area of Annaberg-Maho Bay complex, 20 to 40 percent slopes, extremely stony; on St. John Island, from the intersection of Virgin Islands Highways 10 and 206, about 1.3 miles east on Highway 10 (Centerline Road), about 250 feet northeast of Centerline Road, on a shoulder in the Maho Bay Watershed.

A—0 to 7 inches; very dark brown (10YR 2/2) gravelly loam; weak coarse granular structure; friable, many fine, common medium, and few coarse roots; many fine and medium wormcasts; about 15 percent, by volume, pebbles; slightly acid; clear wavy boundary.

Bw—7 to 11 inches; dark brown (10YR 3/3) gravelly loam; moderate very fine and fine subangular blocky structure; friable; common fine and medium roots; common fine and medium wormcasts; about 30 percent, by volume, pebbles; very strongly acid; clear wavy boundary.

Cr—11 to 22 inches; dark brown (10YR 4/3) saprolite that has a silt loam texture; massive; common fine and few medium roots; very strongly acid; clear wavy boundary.

R—22 to 60 inches; brown (10YR 5/3) unweathered igneous bedrock.

The depth to saprolite ranges from 8 to 20 inches. Reaction ranges from strongly acid to neutral in the A horizon and very strongly acid to slightly acid in the subsoil.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Cr horizon is saprolite.

The R horizon is unweathered igneous bedrock.

Parasol Series

The Parasol series consists of very deep, well drained soils on side slopes and foot slopes of volcanic hills and mountains. These soils formed in material weathered from plutonic gabbro and diorite. Slopes range from 2 to 12 percent. Soils of the Parasol series are fine, smectitic, isohyperthermic Typic Argiustolls.

Parasol soils are commonly associated on the landscape with Jealousy, Maho Bay, Southgate, and Victory soils. All of these soils are on slightly higher summits and side slopes. Jealousy soils are moderately deep. Maho Bay soils are shallow. Southgate and Victory soils do not have a mollic epipedon.

Typical pedon of Parasol clay loam, 5 to 12 percent slopes (fig. 23), on St. Croix Island, from River northeast on Virgin Island Highway 69, about 0.4 mile to a 90-degree northwest bend in the highway, about 0.5 mile northwest along the highway, 300 feet northeast of the highway, in a pasture.

A1—0 to 7 inches; very dark brown (10YR 2/2) clay loam; strong fine and medium granular structure; firm, moderately sticky and moderately plastic; many fine and medium and few coarse roots; many medium and coarse interstitial pores; many medium and coarse wormcasts; about 5 percent, by volume, pebbles; slightly acid; clear wavy boundary.

A2—7 to 13 inches; very dark brown (10YR 2/2) clay loam; strong medium granular structure; firm, moderately sticky and moderately plastic; common fine and medium roots; many medium and coarse

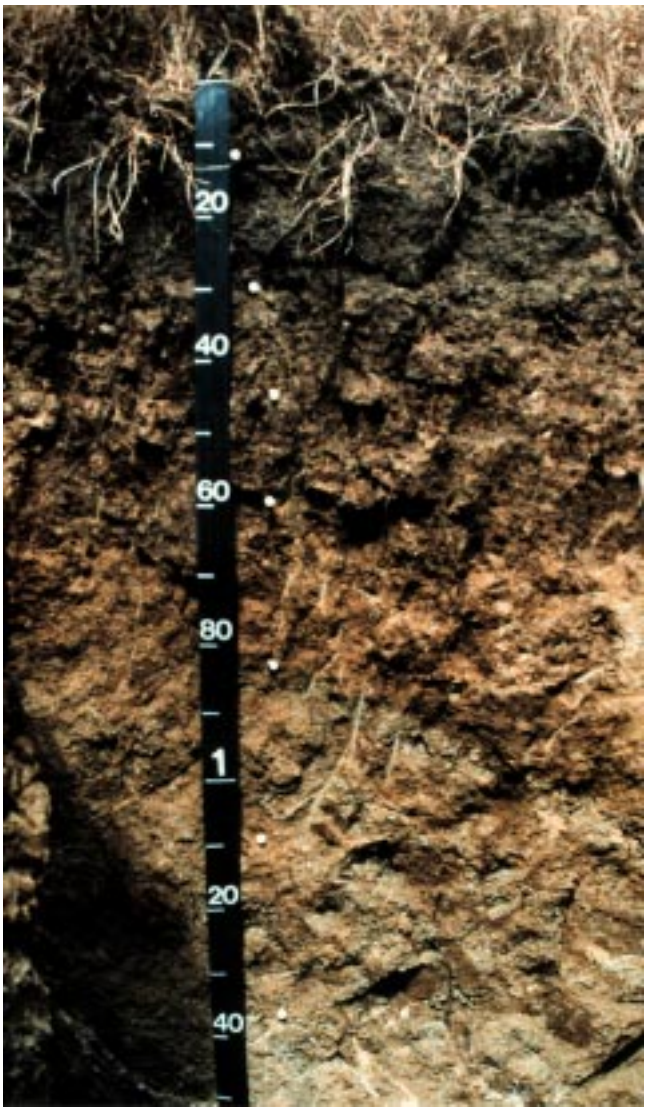


Figure 23.—Profile of Parasol clay loam, 5 to 12 percent slopes. These very deep, well drained soils are on side slopes and footslopes of volcanic hills and mountains. They formed in plutonic residuum.

interstitial pores; many medium and coarse wormcasts; about 5 percent, by volume, pebbles; neutral; clear smooth boundary.

Bt1—13 to 19 inches; brown (10YR 4/3) clay loam; strong medium and coarse prismatic structure; firm, moderately sticky and moderately plastic; few fine and medium roots; few distinct pressure faces on vertical and horizontal faces of peds; common fine and medium vesicular and tubular pores; many fine and medium wormcasts; common fine faint clay films on faces of peds; about 5 percent, by volume, pebbles; neutral; gradual smooth boundary.

Bt2—19 to 24 inches; brown (10YR 4/3) sandy clay loam; moderate medium and coarse prismatic structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium vesicular and tubular pores; common fine and medium wormcasts; few fine faint clay films on faces of peds; about 5 percent, by volume, pebbles; neutral; gradual smooth boundary.

BC—24 to 40 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; about 10 percent, by volume, pebbles; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; neutral; gradual smooth boundary.

C1—40 to 52 inches; brown (10YR 4/3) saprolite that has a sandy loam texture; massive; very friable; few medium feldspar crystals; neutral; gradual smooth boundary.

C2—52 to 62 inches; brown (10YR 4/3) saprolite that has a sandy loam texture; massive; very friable; common medium feldspar crystals; neutral; gradual smooth boundary.

C3—62 to 80 inches; brown (10YR 5/3) saprolite that has a sandy loam texture; massive; very friable; neutral.

The thickness of the solum ranges from 24 to 48 inches. Reaction ranges from strongly acid to neutral in the A horizon, slightly acid to neutral in the Bt and BC horizons, and from neutral to slightly alkaline in the C horizons.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. Texture is sandy clay loam or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 15 percent, by volume.

The Bt horizon has hue of 10YR, value of 3 to 5, and chroma of 3 to 6. Some pedons have few redoximorphic features in shades of brown. Texture is sandy clay loam, clay loam, or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The BC horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 8. Some pedons have few redoximorphic features in shades of brown. Texture is sandy loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume.

The C horizon is saprolite. It has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture is loamy sand, sandy loam, or sandy clay loam in the fine-earth fraction.

Redhook Series

The Redhook series consists of very deep, excessively drained soils on vegetated beaches along the sea coast. These soils formed in alkaline marine deposits. Slopes range from 0 to 5 percent. Soils of the Redhook series are sandy-skeletal, carbonatic, isohyperthermic Typic Ustorthents.

Redhook soils are commonly associated on the landscape with Jaucas, Sandy Point, Solitude, and Sugar Beach soils. Jaucas soils are in landscape positions similar to those of the Redhook soils and have fewer rock fragments. The very poorly drained Sandy Point and Sugar Beach soils are in adjacent saline marshes. The somewhat poorly drained Solitude soils are in lower areas adjacent to saline marshes and flats.

Typical pedon of Redhook extremely stony sand, 0 to 5 percent slopes, rubbly, rarely flooded, on Water Island, on a vegetated beach area east of a triangular salt pond, about 0.4 miles north-northwest of Sprat Point, about 50 feet west of the beach.

A—0 to 7 inches; dark brown (10YR 4/3) extremely stony sand; single grained; loose; common fine and few coarse roots; about 50 percent, by volume, shell and coral pebbles; about 15 percent, by volume, igneous pebbles, cobbles, and stones; strongly effervescent; moderately alkaline; clear wavy boundary.

AC—7 to 10 inches; brown (10YR 5/3) very stony sand; single grained; loose; common fine roots; about 35 percent, by volume, shell and coral pebbles; about 15 percent, by volume, igneous pebbles, cobbles, and stones; strongly effervescent; moderately alkaline; gradual smooth boundary.

C1—10 to 16 inches; very pale brown (10YR 7/3) very gravelly sand; single grained; loose; few fine roots; about 40 percent, by volume, shell and coral pebbles; about 5 percent, by volume, igneous pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—16 to 60 inches; white (10YR 8/2) very gravelly sand; single grained; loose; strongly effervescent; about 30 percent, by volume, shell and coral pebbles; about 5 percent, by volume, igneous pebbles; common fine faint (10YR 7/4) masses of iron accumulation; moderately alkaline.

Reaction is moderately alkaline throughout the profile.

The A horizon has hue of 10YR, value of 4 to 8, and chroma of 2 or 3. The content of coral, shell, and igneous pebbles, cobbles, and stones ranges from 35 to 80 percent, by volume.

The AC horizon has hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 1 to 3. The content of coral, shell, and igneous pebbles, cobbles, and stones ranges from 35 to 50 percent, by volume.

The C horizon has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 1 to 3. The content of coral, shell, and igneous pebbles, cobbles, and stones ranges from 35 to 50 percent, by volume.

Sandy Point Series

The Sandy Point series consists of very deep, very poorly drained soils in saline marshes and flats adjoining the sea. These soils formed in marine sediments that overlie herbaceous plant remains. Slopes range from 0 to 2 percent. Soils of the Sandy Point series are fine-loamy, mixed, superactive, nonacid, isohyperthermic Thapto-Histic Tropic Fluvaquents.

Sandy Point soils are commonly associated on the landscape with Carib, Cinnamon Bay, Glynn, Jaucas, Redhook, Solitude, and Sugar Beach soils. The somewhat poorly drained Carib soils are on flood plains. They have a mollic epipedon. The well drained Cinnamon Bay and Glynn soils are on alluvial fans and terraces. The excessively drained Jaucas and Redhook soils are on vegetated beaches along the sea coast. The somewhat poorly drained Solitude soils are in areas adjacent to saline marshes. Sugar Beach soils are in landscape positions similar to those of the Sandy Point soils. They are organic.

Typical pedon of Sandy Point sandy clay loam, in an area of Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded; on St. Croix, from the intersection of Virgin Islands Highways 80 and 78, about 0.5 mile northeast of Highway 80 (Northshore Road), about 75 feet southeast, in a saline marsh.

A1—0 to 3 inches; olive gray (5Y 4/2) sandy clay loam; weak coarse granular structure; common fine and medium roots; about 5 percent, by volume, pebbles; neutral; clear smooth boundary.

A2—3 to 6 inches; dark gray (5Y 4/1) sandy clay loam; weak coarse granular structure; few fine and medium roots; about 5 percent, by volume, pebbles; common medium distinct dark brown (7.5Y 4/4) masses of iron accumulation; neutral; clear smooth boundary.

Cg—6 to 33 inches; very dark gray (5Y 3/1) clay loam; massive; slightly sticky and slightly plastic; few fine roots; about 5 percent, by volume, pebbles; moderate sulfide odor; common medium faint dark gray (5Y 4/1) iron depletions; neutral; clear smooth boundary.

2Oa—33 to 45 inches; dark brown (7.5YR 3/2) muck;

about 10 percent, by volume, fiber rubbed and about 40 percent, by volume, fiber unrubbed; massive; moderate sulfide odor; neutral; clear smooth boundary.

2Cg—45 to 60 inches; gray (5Y 5/1) mucky clay loam; massive; slightly sticky and slightly plastic; moderate sulfide odor; about 5 percent, by volume, pebbles; neutral.

Reaction is slightly acid to neutral throughout the profile.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 2 or is neutral in hue and has value of 2 to 4. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume.

The Cg horizon has hue of 2.5Y or 5Y, value of 3 to 6, and chroma of 0 to 2 or is neutral in hue and has value of 3 to 6. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 30 percent, by volume.

The 2Oa horizon has hue of 7.5YR to 5Y, value of 2 to 4, and chroma of 0 to 2 or is neutral in hue and has value of 2 to 4. Texture is muck. The content of pebbles ranges from 0 to 15 percent, by volume.

The 2Cg horizon has hue of 2.5Y or 5Y, value of 3 to 5, and chroma of 0 to 2 or is neutral in hue and has value of 3 to 5. Texture is mucky loam or mucky clay loam in the fine-earth fraction. The content of pebbles ranges from 0 to 15 percent, by volume.

Sion Series

The Sion series consists of very deep, well drained soils on side slopes and valley floors. These soils formed in alkaline marine deposits. Slopes range from 0 to 5 percent. Soils of the Sion series are coarse-loamy, carbonatic, isohyperthermic Typic Calciustolls.

Sion soils are commonly associated on the landscape with Arawak, Glynn, Hesselberg, and Hogensborg soils. Arawak soils are on higher summits and side slopes and are shallow. Glynn and Hogensborg soils are on alluvial fans and terraces. Glynn soils are clayey-skeletal. Hogensborg soils are clayey. Hesselberg soils are on marine terraces. They are shallow over a petrocalcic horizon.

Typical pedon of Sion clay, 2 to 5 percent slopes, rarely flooded (fig. 24), on St. Croix Island, in a pasture adjacent to the University of the Virgin Islands Agricultural Experiment Station east entrance, from the intersection of Virgin Islands Highways 70 and 64, about 800 feet south on Highway 64, about 400 feet east, in a pasture.

Figure 24.—Profile of Sion clay, 2 to 5 percent slopes, rarely flooded. These very deep, well drained soils are on side slopes and valley floors of calcareous marine deposits on St. Croix Island.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) clay; strong medium and coarse granular structure; firm, moderately sticky and moderately plastic; many fine and medium and few coarse roots; many fine and medium interstitial pores; many fine and medium wormcasts and insectcasts; about 10 percent, by volume, limestone pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.

A2—6 to 12 inches; dark brown (10YR 3/3) clay; strong medium and coarse granular structure; firm, moderately sticky and moderately plastic; many fine and medium roots; many fine and medium distinct interstitial pores; common fine and medium wormcasts and insectcasts; about 5 percent, by volume, limestone pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk—12 to 16 inches; brown (10YR 5/3) gravelly clay; moderate fine and medium subangular blocky structure; firm, moderately sticky and moderately

plastic; common fine and medium roots; many fine and medium vesicular and tubular pores; few fine and medium wormcasts and insectcasts; many fine and medium soft masses of calcium carbonate; about 25 percent, by volume, limestone pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

CBk—16 to 24 inches; pinkish white (7.5YR 8/2) gravelly sandy clay loam; massive; friable, slightly sticky and slightly plastic; common fine and medium roots; many fine and medium vesicular and tubular pores; common fine and medium wormcasts and insectcasts; many fine and medium soft masses of calcium carbonate; about 30 percent, by volume, limestone pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

C1—24 to 32 inches; pinkish white (7.5YR 8/2) gravelly sandy loam; massive; very friable; few fine roots; common fine and medium vesicular and tubular pores; common fine and medium soft masses of calcium carbonate; few fine and medium insectcasts; about 20 percent, by volume, limestone pebbles; violently effervescent; moderately alkaline; clear wavy boundary.

C2—32 to 60 inches; pinkish white (7.5YR 8/2) loam; massive; friable, slightly sticky and slightly plastic; few fine roots; common fine and medium vesicular and tubular pores; common fine and medium soft masses of calcium carbonate; about 5 percent, by volume, limestone pebbles; violently effervescent; moderately alkaline.

The thickness of the solum ranges from 15 to 30 inches. Reaction is slightly to moderately alkaline in the A horizon and moderately alkaline in the rest of the profile.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is clay or clay loam in the fine-earth fraction. The content of limestone pebbles ranges from 0 to 30 percent, by volume.

The Bk horizon has hue of 7.5YR to 2.5Y, value of 3 to 8, and chroma of 1 to 6. Texture is loam, clay loam, or clay in the fine-earth fraction. Soft masses of calcium carbonate range from few to many. The content of limestone pebbles ranges from 15 to 30 percent, by volume.

The CBk horizon has hue of 7.5YR to 2.5Y, value of 4 to 8, and chroma of 0 to 4 or is neutral in hue. Texture is sandy clay loam or loam in the fine-earth fraction. Soft masses of calcium carbonate range from few to many. The content of limestone pebbles ranges from 15 to 30 percent, by volume.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 8, and chroma of 1 to 4 or is neutral in hue. Texture is loam, silt loam, or sandy loam in the fine-earth fraction. Soft masses of calcium carbonate range from few to many. The content of limestone pebbles ranges from 10 to 30 percent, by volume.

Solitude Series

The Solitude series consists of very deep, somewhat poorly drained soils in areas adjacent to saline marshes, flats, and salt ponds. These soils formed in alluvial and marine sediments. Slopes range from 0 to 2 percent. Soils of the Solitude series are fine-loamy, mixed, superactive, nonacid, isohyperthermic Aeric Tropaquepts.

Solitude soils are commonly associated on the landscape with Carib, Cinnamon Bay, Glynn, Jaucas, Lameshur, Redhook, Sandy Point, and Sugar Beach soils. Carib soils are on flood plains and have a mollic epipedon. The well drained Cinnamon Bay and Glynn soils are on slightly higher alluvial fans and terraces. The excessively drained Jaucas and Redhook soils are on slightly higher, vegetated beaches adjacent to the sea. The excessively drained Lameshur soils are on slightly higher alluvial fans and terraces. The very poorly drained Sandy Point and Sugar Beach soils are in adjacent saline marshes They have thick organic layers.

Typical pedon of Solitude gravelly fine sandy loam, 0 to 2 percent slopes, frequently flooded, on St. John Island, about 0.3 miles from the barricaded end of Lameshur Bay Road, about 100 feet at 210 degrees downslope of Lameshur Bay Road.

A1—0 to 6 inches; light olive brown (2.5Y 5/3) gravelly fine sandy loam; weak fine and medium granular structure; very friable; common fine and few medium roots; many fine and medium interstitial pores; common medium wormcasts; about 15 percent, by volume, pebbles; common medium soft masses of iron and manganese; moderately acid; clear smooth boundary.

Bw—6 to 10 inches; light olive brown (2.5Y 5/3) gravelly fine sandy loam; weak fine and medium subangular blocky structure; very friable; few fine and medium roots; many medium and coarse tubular pores; common medium and coarse wormcasts; about 20 percent, by volume, pebbles; many fine soft masses of iron and manganese; common fine and medium prominent yellowish red (5YR 5/6) masses of iron accumulation; neutral; gradual smooth boundary.

Bg1—10 to 17 inches; grayish brown (2.5Y 5/2) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; many fine and medium tubular pores and

voids; common fine and medium wormcasts; about 15 percent, by volume, pebbles; many fine soft masses of iron and manganese; many medium and coarse prominent yellowish red (5YR 5/6) masses of iron accumulation; neutral; gradual smooth boundary.

Bg2—17 to 28 inches; grayish brown (2.5Y 5/2) gravelly fine sandy loam; moderate medium subangular blocky structure; hard, very friable; few fine and medium roots; many medium and coarse tubular pores; common fine and medium wormcasts; about 15 percent, by volume, pebbles; many fine soft masses of iron and manganese; many medium and coarse prominent yellowish red (5YR 5/6) masses of iron accumulation; slightly alkaline; gradual smooth boundary.

Bg3—28 to 57 inches; grayish brown (2.5Y 5/2 gravelly loam; moderate medium subangular blocky structure; friable; common fine and few medium roots; common fine and medium tubular pores; about 20 percent, by volume, pebbles; many fine soft masses of iron and manganese; common medium prominent strong brown (7.5YR 4/6) masses of iron accumulation; slightly alkaline; gradual smooth boundary.

Bg4—57 to 61 inches; light olive brown (2.5Y 5/2) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; common fine and medium tubular pores; about 20 percent, by volume, pebbles; many fine distinct soft masses of iron and manganese; common medium prominent strong brown (7.5YR 4/6) masses of iron accumulation; neutral.

The thickness of the solum ranges from 40 to 60 inches or more. Reaction ranges from slightly acid to neutral throughout the profile. The soils are slightly to strongly saline in the upper part and moderately to strongly saline in the lower part.

The A horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 4. Texture is fine sandy loam or loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Bw horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 3 to 6. It has common to many redoximorphic features in shades of red, brown, yellow and gray. Texture is fine sandy loam or loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 30 percent, by volume.

The Bg horizon has hue of 2.5Y, value of 5 or 6, and chroma of 1 to 4 or is neutral in hue. It has common to many redoximorphic features in shades of red, brown, yellow, and gray. Texture is fine sandy loam or loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 30 percent, by volume.

Southgate Series

The Southgate series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from igneous bedrock. Slopes range from 2 to 90 percent. Soils of the Southgate series are loamy-skeletal, mixed, active, isohyperthermic Lithic Ustropepts.

Southgate soils are commonly associated on the landscape with Cramer, Dorothea, Jealousy, Maho Bay, Parasol, Susannaberg, and Victory soils. Cramer, Dorothea, Jealousy, Maho Bay, Susannaberg, and Victory soils are in landscape positions similar to those of the Southgate soils. Cramer and Susannaberg soils are clayey. Dorothea soils are very deep. Jealousy and Victory soils are moderately deep. Parasol soils are on slightly lower side slopes and foot slopes. They are very deep.

Typical pedon of Southgate gravelly loam, in an area of Victory-Southgate complex, 40 to 70 percent slopes, very stony; on St. Croix Island, from the intersection of Virgin Islands Highways 80 (North Shore Road) and 78, about 1.6 miles west on Highway 78 to a paved road exiting to the north, about 75 feet above the road, on a slope.

A—0 to 5 inches; brown (7.5YR 4/2) gravelly loam; weak fine and medium granular structure; friable; many fine medium and coarse roots; about 25 percent, by volume, pebbles; neutral; gradual smooth boundary.

Bw—5 to 10 inches; brown (7.5YR 4/4) very gravelly loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; about 55 percent, by volume, pebbles; moderately acid; gradual smooth boundary.

Cr—10 to 17 inches; brown (7.5YR 4/4) weathered igneous bedrock; few fine roots between fractures; moderately acid; clear wavy boundary.

R—17 to 60 inches; brown (7.5YR 4/4) unweathered igneous bedrock.

The depth to unweathered igneous bedrock ranges from 10 to 20 inches. Reaction ranges from strongly acid to neutral in the upper part and very strongly acid to slightly acid in the lower part

The A horizon has hue of 5YR to 10YR, value of 2 to 6, and chroma of 2 to 4. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 15 to 60 percent, by volume.

The Bw horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 3 to 6. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 60 percent, by volume.

The Cr horizon is weathered igneous bedrock.
The R horizon is unweathered igneous bedrock.

Sugar Beach Series

The Sugar Beach series consists of very deep, very poorly drained soils in saline marshes adjacent to the sea. These soils formed in organic materials consisting of the remains of hydrophytic plants. Slopes range from 0 to 2 percent. Soils of the Sugar Beach series are euic, isohyperthermic Fluvaquentic Troposaprists.

Sugar Beach soils are commonly associated on the landscape with Carib, Cinnamon Bay, Glynn, Jaucas, Lameshur, Redhook, Sandy Point, and Solitude soils. The well drained Cinnamon Bay and Glynn soils are on slightly higher alluvial fans and terraces. The somewhat poorly drained Carib soils are on flood plains. They are fine-loamy. The excessively drained Jaucas and Redhook soils are on slightly higher vegetated beaches adjacent to the sea. The excessively drained Lameshur soils are on slightly higher alluvial fans and terraces. The somewhat poorly drained Solitude soils are in slightly higher areas adjacent to saline marshes. Sandy Point soils are in landscape positions similar to those of the Sugar Beach soils. They are fine-loamy.

Typical pedon of Sugar Beach muck, in an area of Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded; on St. Croix Island, about 0.3 mile west of the intersection of Virgin Islands Highways 82 and 62, northeast on an improved road that exits Highway 82, about 400 feet northeast across a drain to the northern bank of the drain, about 1,000 feet northwest on a foot trail along the northern bank that delineates the drain and salt marsh, about 100 feet northwest, in a marsh.

Oa—0 to 4 inches; black (10YR 2/1) muck; about 10 percent fiber, by volume, rubbed and about 35 percent fiber, by volume, unrubbed; massive; many medium and coarse roots; neutral; clear smooth boundary.

Cg—4 to 8 inches; dark grayish brown (2.5Y 4/2) mucky clay loam; massive; sticky and slightly plastic; moderate sulfide odor; many medium and coarse roots; common fine and medium black (10YR 2/1) soft masses of iron and manganese; neutral; clear smooth boundary.

O´a1—8 to 24 inches; dark brown (7.5YR 3/2) muck; about 10 percent fiber, by volume, rubbed and about 40 percent fiber, by volume, unrubbed; massive; moderate sulfide odor; few fine and medium roots; neutral; clear smooth boundary.

O´a2—24 to 60 inches; dark brown (7.5YR 3/2) muck; about 10 percent fiber, by volume, rubbed and about 40 percent fiber, by volume, unrubbed; massive; moderate sulfide odor; few very fine and fine roots; about 5 percent, by volume, mineral material in thin-bedded strata; neutral.

The soil is strongly saline throughout. Reaction ranges from slightly acid to neutral. After drying, the reaction of the soils ranges from strongly acid to neutral. A moderate sulfide odor is throughout the profile.

The Oa horizon has hue of 7.5YR or 10YR, value of 2, and chroma of 1 or 2. The content of pebbles ranges from 0 to 15 percent, by volume.

The Cg horizon has hue of 2.5Y or 5Y, value of 3 to 6, and chroma of 1 or 2. Some pedons have few or common redoximorphic features in shades of yellow, brown, and gray. Some pedons have few or common soft masses of iron and manganese. The content of pebbles ranges from 0 to 15 percent, by volume.

The O´a1 horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. The content of pebbles ranges from 0 to 15 percent, by volume.

The O´a2 horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 or 2. The content of thin-bedded strata of mineral matter ranges from 0 to 5 percent, by volume. The content of pebbles ranges from 0 to 15 percent, by volume.

Susannaberg Series

The Susannaberg series consists of shallow, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in clayey material weathered from igneous bedrock. Slopes range from 12 to 90 percent. Soils of the Susannaberg series are clayey, vermiculitic, isohyperthermic, shallow Typic Haplustolls.

Susannaberg soils are commonly associated on the landscape with Cramer, Dorothea, Fredriksdal, Maho Bay, Southgate, and Victory soils. All of these soils are in landscape positions similar to those of the Susannaberg soils. Cramer soils have mixed clay control sections. Dorothea soils are very deep. Fredriksdal soils are clayey-skeletal. Southgate soils are loamy-skeletal. Maho Bay soils are loamy. Victory soils are moderately deep.

Typical pedon of Susannaberg clay loam, in an area of Fredriksdal-Susannaberg complex, 40 to 60 percent slopes, extremely stony (fig. 25); on St. John Island, about 0.2 mile north on a jeep trail that exits North Shore Road, about 0.3 mile east of an access road to Cinnamon Bay Campground, about 150 feet north of the jeep trail, on a side slope.

A—0 to 2 inches; very dark brown (10YR 2/2) clay loam; moderate medium and coarse granular

Figure 25.—Profile of Susannaberg clay loam, in an area of Fredriksdal-Susannaberg complex, 40 to 60 percent slopes, extremely stony. These shallow, well drained soils are on summits and side slopes of volcanic hills and mountains of St. Thomas and St. John Islands.

structure; friable; common fine and medium and few coarse roots; common fine and medium interstitial pores; few medium wormcasts; about 10 percent, by volume, pebbles, cobbles, and stones; neutral; clear smooth boundary.

Bw—2 to 9 inches; very dark brown (10YR 2/2) clay; moderate fine and medium subangular blocky structure; firm; common fine and medium and few coarse roots; common fine and medium tubular pores; few medium wormcasts; about 10 percent, by volume, pebbles; many fine soft masses of iron and manganese; neutral; clear wavy boundary.

BC—9 to 15 inches; dark brown (10YR 3/3) gravelly clay loam; weak fine subangular blocky structure; friable; few fine medium and coarse roots; common fine tubular pores; many fine and medium wormcasts; about 30 percent, by volume, pebbles; common medium and coarse soft masses of iron and manganese; neutral; abrupt smooth boundary.

Cr—15 to 21 inches; yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/5) weathered igneous bedrock.

R—21 to 60 inches; yellowish brown (10YR 5/4) unweathered igneous bedrock.

The depth to weathered igneous bedrock ranges from 10 to 20 inches. The depth to unweathered igneous bedrock is more than 20 inches. Reaction ranges from slightly acid to neutral throughout the profile.

Figure 26.—Profile of Victory loam, in an area of Victory-Southgate complex, 12 to 20 percent slopes, very stony. These well drained soils are on summits and side slopes of volcanic hills and mountains throughout the United States Virgin Islands.

The A horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles, cobbles, and stones ranges from 0 to 30 percent, by volume.

The Bw horizon has hue of 5YR to 10YR, value of 2 to 5, and chroma of 2 to 6. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The BC horizon has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. Texture is clay loam or clay in the fine-earth fraction. The content of pebbles and cobbles ranges from 0 to 30 percent, by volume.

The Cr horizon is weathered igneous bedrock.

The R horizon is unweathered igneous bedrock.

Victory Series

The Victory series consists of moderately deep, well drained soils on summits and side slopes of volcanic hills and mountains. These soils formed in material weathered from extrusive igneous bedrock. Slopes range from 2 to 70 percent. Soils of the Victory series are loamy-skeletal, mixed, superactive, isohyperthermic Typic Ustropepts.

Victory soils are commonly associated on the landscape with Annaberg, Cramer, Dorothea, Fredriksdal, Jealousy, Maho Bay, Parasol, Southgate, and Susannaberg soils. Annaberg, Cramer, Dorothea, Fredriksdal, Jealousy, Maho Bay, Southgate, and Susannaberg soils are in landscape positions similar to those of the Victory soils. Annaberg, Cramer, Southgate, and Susannaberg soils are shallow. Dorothea soils are very deep. Fredriksdal soils are shallow over bedrock and are clayey-skeletal. Jealousy soils have fine, smectitic control sections. Parasol soils are on slightly lower side slopes and foot slopes and are very deep.

Typical pedon of Victory loam, in an area of Victory-Southgate complex, 12 to 20 percent slopes, very stony (fig. 26); on St. Croix Island, near Annaly, from the intersection of Virgin Islands Highways 63 and 78, west about 0.1 mile on Highway 78, about 500 feet north of the highway, in a pasture.

A—0 to 6 inches; brown (10YR 4/3) loam; moderate fine and medium granular structure; friable; common fine and medium and few coarse roots; many fine and medium interstitial pores; many fine and medium wormcasts and insectcasts; about 10 percent, by volume, pebbles; neutral; clear wavy boundary.

AB—6 to 11 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; common fine and medium and few coarse roots; many fine and medium interstitial pores; many fine and medium wormcasts and insectcasts; about 10 percent, by volume, pebbles; slightly acid; clear wavy boundary.

Bw1—11 to 14 inches; dark yellowish brown (10YR 4/4) very gravelly loam; moderate medium subangular blocky structure; friable; common fine and medium roots; common fine and medium vesicular and tubular pores; common fine and medium wormcasts and insectcasts; about 35 percent, by volume, pebbles; few medium distinct brown (7.5YR 5/4) masses of iron accumulation; slightly acid; gradual wavy boundary.

Bw2—14 to 20 inches; brown (7.5YR 5/4) very gravelly loam; moderate medium subangular blocky structure; friable; few fine and medium roots; common fine and medium vesicular and tubular pores; common fine and medium wormcasts and insectcasts; about 35 percent, by volume, pebbles; few fine and medium faint reddish yellow (7.5YR 6/6) masses of iron accumulation; slightly acid; gradual wavy boundary.

C—20 to 33 inches; very pale brown (10YR 7/4) very gravelly loam; massive; friable; few fine and medium roots; few fine and medium vesicular and tubular pores; few fine and medium wormcasts and insectcasts; about 55 percent, by volume, pebbles; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; slightly acid; gradual wavy boundary.

Cr—33 to 50 inches; very pale brown (10YR 7/4) weathered igneous bedrock; slighty acid; clear smooth boundary.

R—50 to 60 inches; very pale brown (10YR 7/4) unweathered igneous bedrock.

The thickness of the solum and depth to weathered igneous bedrock range from 20 to 40 inches. The depth to unweathered igneous bedrock ranges from 40 to 60 inches or more. Reaction ranges from slightly acid to neutral throughout the profile.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles, cobbles, and stones ranges from 0 to 35 percent, by volume.

The AB horizon, where present, has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 4 to 6. Texture is loam, sandy clay loam, or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 10 to 35 percent, by volume.

The Bw horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Some pedons have few

redoximorphic features in shades of brown. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 50 percent, by volume.

The C horizon has hue of 5YR to 10YR, value of 3 to 7, and chroma of 4 to 8. Some pedons have few or common redoximorphic features in shades of brown. Texture is loam or clay loam in the fine-earth fraction. The content of pebbles and cobbles ranges from 35 to 60 percent or more, by volume.

The Cr horizon is weathered igneous bedrock.

The R horizon is unweathered igneous bedrock.

Formation of the Soils

Factors of Soil Formation

This section describes the factors of soil formation as they relate to the soils of the United States Virgin Islands and explains the major processes in the development of soil horizons *(5, 17)*.

Climate

Temperature and precipitation influence the rates of chemical and physical processes in the soil. The Virgin Islands have a warm, maritime tropical climate.

Rainfall. The amount of annual rainfall differs substantially between various locations throughout the islands. Most of the areas in the survey area receive between 30 and 60 inches of rainfall annually. The easternmost sections of St. Croix, St. Thomas, and St. John Islands receive 20 to 30 inches of rain. The driest areas are the windward coastal areas.

No sharply defined wet season or dry season exists in the islands. Generally, the wettest period extends from September to November, and the driest period extends from December to June.

Temperature. The difference between the mean temperatures of the coolest and warmest months is only about 5 to 7 degrees. The highest temperatures occur in August or September, and the lowest temperatures are in January or February.

The amount of rainfall and the year-round warm air temperatures are adequate to rapidly oxidize organic matter and leach soil nutrients from the surface layer of the soils.

Plant and Animal Life

Plants, animals, bacteria, fungi, and humans affect the formation of soils. The type of vegetation affects the content of organic matter and the amount of nutrients released to the soil. Most of the soils in the survey area formed under drought-tolerant range vegetation. Animals, particularly burrowing animals and insects, keep the soil open and porous. Bacteria and fungi decompose plant material into organic matter and promote its incorporation into the soil. Human activities that alter the soil include clearing, plowing, draining, irrigating, and applying farm chemicals.

Parent Material

Parent material is the weathered mass from which the soil forms, and it generally determines the chemical and mineral composition of the soil. The soils in the U.S. Virgin Islands formed in materials of volcanic or marine origin that have been subjected to weathering and erosion processes.

Soils in the rugged mountain ranges of the Virgin Islands were formed in volcanic residuum. Most of the volcanic material was extruded beneath the sea and uplifted. In subsequent eras, continued volcanism produced plutons and dikes in some areas. The soils in these gently to very steeply sloping areas can be separated by mineralogy.

Annaberg, Cramer, Maho Bay, Victory, and Southgate soils are the main soils that have mixed mineralogy and are in the volcanic hills and mountains. Jealousy and Parasol soils are associated with plutons and dikes and have smectitic mineralogy. Fredriksdal, Susannaberg, and Dorothea soils have vermiculitic mineralogy.

Soils on the coastal plains throughout the survey area formed in sediments that were moved and deposited by marine or stream action. The soils of the coastal plain are on one of the three main landscape positions—nearly level to strongly sloping upland alluvial fans and terraces composed of material of volcanic origin; gently to very steeply sloping ancient upland marine terraces; and nearly level saline low land terraces, flats, and ponds.

Glynn, Hogensborg, and Cinnamon Bay soils are alluvial soils of volcanic origin. Arawak, Hesselberg, and Sion soils are on ancient upland marine terraces. Sandy Point, Sugar Beach, and Solitude soils are in saline ponds and marshes and on tidal flats.

The coastal plain sediments are generally hundreds of feet thick and are underlain by volcanic bedrock.

Topography

Topography, or relief, modifies the effects of other soil-forming factors, and in many places more than one kind of soil forms from similar parent material. For example, Fredriksdal, Susannaberg, and Dorothea soils formed in similar parent material and are adjacent to

each other, but Dorothea soils are deeper, have a higer available water capacity, and are more fertile than the Susannaberg or Fredriksdal soils.

Time

Time allows the development of a soil profile; consequently, young soils have less developed horizons than older soils. Most of the soils throughout the survey area are shallow, but they do display well-developed horizons. Soils that are subject to flooding include Carib, Jaucas, Lameshur, Redhook, Sandy Point, Sugar Beach, and Solitude soils. They receive new sediments during each period of flooding, show little profile development, and are considered young soils.

Major Soil Horizons

The results of the soil-forming factors can be distinguished by the different layers, or soil horizons, in a soil profile. The soil profile extends from the surface down to materials that are only slightly altered by soil-forming processes. Most soils contain four major horizons, which are A, E, B, and C horizons. These major horizons can be further subdivided by the use of numbers and letters to indicate changes within a horizon. The Bt horizon, for example, is a B horizon that has an accumulation of clay.

The A horizon, or surface layer, is characterized by an accumulation of organic matter. The E horizon, or subsurface layer, is the horizon of maximum leaching and eluviation of clay and iron.

The B horizon underlies the E horizon and is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds leached from the surface and subsurface layers. In some soils, the B horizon formed through the alteration of materials in place, rather than by illuviation. This alteration could have been caused by weathering of clay minerals. The B horizon commonly has blocky or prismatic structure. Generally, it is firmer and lighter in color than the A1 horizon but is darker in color than the C horizon.

The C horizon is directly below the B horizon or, in some soils, directly below the A horizon. It consists of materials that have been little altered by the soil-forming processes, but in some soils it is modified by weathering.

Processes of Horizon Differentiation

In the U.S. Virgin Islands, several processes are involved in the formation of soil horizons. Among these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation of soil structure, and the formation and translocation of clay minerals. These processes continually take place, generally at the same time, throughout the profile. Processes such as these have been going on for thousands of years.

The accumulation and incorporation of organic matter takes place with the decomposition of plant residue. These additions of residue darken the surface layer and help to form the A horizon. If organic matter has been lost, a long period of time generally is needed to replace it. In the U.S. Virgin Islands, the content of organic matter in the surface layer generally falls between 2 and 8 percent, by weight.

For soils to have distinct subsoil horizons, it is believed that some of the lime and soluble salts must be leached before the translocation of clay minerals. Factors that affect the leaching include the kinds of salts that were originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

Well drained and moderately well drained soils in the survey area have a dark reddish brown to light olive brown subsoil. These colors have been caused mainly by thin coatings of iron oxides on sand and silt grains, except where the colors were inherited from the parent material. Most soils have a strong to moderate, fine to medium granular structure in the surface layer. The structure of the subsoil is weak to strong prismatic or subangular blocky.

The reduction and transfer of iron, called gleying, is associated mainly with the wetter, more poorly drained soils. Moderately well drained to somewhat poorly drained soils have yellowish brown and strong brown mottles because of the segregation of iron. In poorly drained soils, such as Sandy Point soils, and somewhat poorly drained soils, such as Carib and Solitude soils, the grayish subsoil is the result of the reduction and transfer of iron in solution.

References

1. American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

2. American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

3. Borgesen, F. 1923. On the vegetation of the Virgin Islands of the United States, formerly the Danish West Indies. Gov. Print. Office, St. Thomas.

4. Bowden, et al. 1974. Hurricane in paradise—perception and reality of the hurricane hazards in the Virgin Islands. Clark Univ., Worcester, Mass.

5. Buol, S.W., F.D. Hole, and R.J. McCracken. 1980. Soil genesis and classification. 3d ed.

6. Burke, K., P.J. Fox, and A.M.C. Sengor. 1978. Buoyant ocean floor and the evolution of the Caribbean. Journal of Geophysical Research, vol. 83, no. B8, pp. 3,949–3,954.

7. Creque, D.D. 1968. The U.S. Virgins and the eastern Carribbean. Whitmore Publ. Co., Philadelphia, Penn.

8. Donnelly, T.W. 1965. Sea-bottom morphology suggestive of post-Pleistocene tectonic activity of the eastern Greater Antilles. Geol. Soc. of Amer. Bull., vol. 76.

9. Donnelly, T.W. 1966. Geology of St. Thomas and St. John, U.S. Virgin Islands. *In* Caribbean geological investigations. H.H. Hess, ed. Geol. Soc. of Amer. Memoir 98, pp. 85–176.

10. Donnelly, T.W. and J.J.W. Rogers. 1980. Igneous series in island arcs: the northeastern Caribbean compared with worldwide island-arc assemblages. Bull. Vocanologique. Vol. 43, pp. 347–382.

11. Donnelly, et al. 1990. History and tectonic setting of Caribbean magmatism. *In* The Caribbean region. G. Dengo and J.E. Case, eds. Geol. Soc. of America, Boulder, Colorado. The geology of North America, vol. H, pp. 339–374.

12. Dookhan, I. 1974. A history of the Virgin Islands of the United States. Caribbean Univ. Press and Bowker Publ. Co., Essex, England.

13. Draper, G., and J. Pindell. 1995. The Caribbean: perspectives on a plates progress. Geol. Soc. of Amer. Abstracts with Programs, vol. 27, p. A152.

14. Frankel, A., W.R. McCann, and A.J. Murphy. 1980. Observations from a seismic network in the Virgin Islands region: tectonic structures and earthquake swarms. Journ. of Geophys. Res., vol. 85, B5, pp. 2,669–2,678.

15. Hall, S.A. 1995. Oceanic basement of the Caribbean basins. Geol. Soc. of Amer. Abstracts with Programs, vol. 27, p. A153.

16. Helsley, C.E. 1971. Summary of the geology of the British Virgin Islands *in* Transactions of the fifth Caribbean Geological Conference. St. Thomas, U.S.V.I., 1968, pp. 69—76.

17. Jenny, Hans. 1941. Factors of soil formation—a system of quantitative pedology. McGraw-Hill, New York.

18. Jordan, D.G. 1972. Land use effect on the water regime of the U.S. Virgin Islands. U.S. Geol. Surv. Prof. Pap. 800–D.

19. Mattson, P.H., G. Draper, and J.F. Lewis. 1990. Puerto Rico and the Virgin Islands. *In* The Caribbean region. G. Dengo and J.E. Case, eds. Geol. Soc. of America, Boulder, Colorado. The geology of North America, vol. H, pp. 112–120.

20. Montgomery, H., E.A. Pressagno, Jr., and J.L. Pindell. 1994. A 195 Ma terrane in a 165 Ma sea: Pacific origin of the Caribbean plate. Geol. Soc. of Amer., GSA Today, Vol. 4, No. 1, pp. 2–6.

21. Owenby, J.R. and D.S. Ezell. 1992. Monthly station normals of temperature, precipitation, and heating and cooling degree days 1961–1990. U.S. Dept. of Commerce, NOAA Climatography of the U.S., no. 81.

22. Peebles, R.W., E.P. Albert, and H.H. Smith. 1979. Waterplan: a comprehensive water management framework for the U.S. Virgin Islands. Virgin Islands Resources Research Center, Tech. Rep. No. 2. College of the Virgin Islands Caribbean Research Instit.

23. Pessagno, E.A. Jr. 1976. Middle Cretaceous planktonic foraminiferal biostratigraphy of the Antillean-Caribbean region and eastern Mexico. Musee d'Histoire Naturelle de Nice. Annales Tome 4, pp. 176–182.

24. Pindell, J.L. 1990. Geological arguments suggesting a Pacific origin for the Caribbean plate. *In* Transactions of the 12th Caribbean Geological Conference. D.K Larue and G. Draper, eds. St. Croix, U.S. Virgin Islands. Miami Geol. Soc., pp. 1–4.

25. Pindell, J.L. and S.F. Barret. 1990. Geological evolution of the Caribbean region: a plate-tectonic perspective. *In* The Caribbean region. G. Dengo and J.E. Case, eds. Geol. Soc. of America, Boulder, Colorado. The geology of North America, vol. H, pp. 405–432.

26. Rankin, D.W. 1997. Geologic Map of St. John, U.S. Virgin Islands. U.S. Geol. Surv. Open File Rep. 97–472, scale 1:24,000.

27. Rivera, L.H., W.D. Frederick, C. Farris, E.H. Jensen, L. Davis, D.D. Palmer, L.F. Jackson, and W.E. McKinzie. 1970. Soil survey of the Virgin Islands of the United States. Unit. States Dept. of Agric., Soil Conservation Serv.

28. United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Surv. Invest. Rep. 42.

29. United States Department of Agriculture, Soil Conservation Service. National engineering handbook. (Available in the State Office of the Soil Conservation Service at San Juan, Puerto Rico)

30. United States Department of Agriculture, Soil Conservation Service. National soil survey handbook. Soil Surv. Staff (available in the State Office of the Soil Conservation Service).

31. United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.

32. United States Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436.

33. United States Department of Agriculture, Soil Conservation Service. 1981. Land resource regions and major land resource areas of the United States. U.S. Dep. Agric. Handb. 296.

34. United States Department of Agriculture, Soil Conservation Service. 1992. Keys to soil taxonomy. 5th ed. Soil Surv. Staff, Soil Manage. Support Serv. Tech. Monogr. 19.

35. United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Surv. Staff, U.S. Dep. Agric. Handb. 18.

36. United States Bureau of the Census. 1992. Statistical abstract of the United States: 1992. 112th edit.

37. United States Department of Commerce. 1992. Census of agriculture. Vol. 1, part 54. Virgin Islands of the United States area data.

38. United States Department of the Interior, United States Geological Survey. 1994. National water summary, 1988-89: hydrologic events and floods and droughts. Water supp. pap. 2375.

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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that, when dissolved in 1N ammonium acetate, is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2
Low	2 to 4.5
Moderate	4.6 to 6.9
High	7 or more

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.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Carbonates of divalent cations. Cold 2.87N (about a 1:10 dilution of concentrated HCl) hydrochloric acid is used to test for carbonates in the field. The amount and expression of effervescence is affected by size distribution and mineralogy as well as the amount of carbonates. Consequently, effervescence cannot be used to estimate the amount of carbonate. Four classes of effervescence are used:

Very slightly effervescent ..... few bubbles seen
Slightly effervescent ..... bubbles readily seen
Strongly effervescent ..... bubbles form low foam
Violently effervescent ..... thick foam forms quickly

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.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

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.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured

material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

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.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above.

When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

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.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gut. A gully, ravine, smalle valley, or narrow passage on land or a tidal stream connecting two larger waterways.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil.

The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

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.

Inundation classes. Used to classify the frequency and duration of flooding. The frequency of flooding classifications and criteria are as follows:

None (N)	No reasonable possibility
Rare (R)	1 to 5 times in 100 years
Occasional (O)	5 to 50 times in 100 years
Frequent (F)	50 or more times in 100 years
Common (C)	Grouping of occasional and frequent classes, used for certain purposes

The duration of flooding classifications and criteria are as follows:

Extremely brief (BE)	Less than 4 hours (flooding only)
Very brief (BV)	4 to 48 hours
Brief (B)	2 to 7 days
Long (L)	7 days to 1 month
Very long (LV)	More than 1 month

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

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.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees

of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders. The roundess of the fragments may be indicated as angular (strongly developed faces with sharp edges), irregular (prominent flat faces with incipient rounding of corners), subrounded (detectable flat faces with well-rounded corners), and rounded (flat faces absent or nearly absent with all corners rounded). The names and sizes, in millimeters, of rock fragments are as follows—

Shape and size	Noun	Adjective
Spherical, cubelike, or equiaxial:		
2-75 mm diameter	Pebbles	Gravelly
2-5 mm diameter	Fine	Fine gravelly
5-20 mm diameter gravelly	Medium	Medium
20-75 mm diameter gravelly	Coarse	Coarse
75-250 mm diameter	Cobbles	Cobbly
250-600 mm diameter	Stones	Stony
> 600 mm diameter	Boulders	Bouldery
Flat:		
2-150 mm long	Channers	Channery
150-380 mm long	Flagstones	Flaggy
380-600 mm long	Stones	Stony
> 600 mm diameter	Boulders	Bouldery

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 saturation extract method is the standard measure of salinity. Electrical conductivity is related to the amount of salts more soluble than gypsum in the soil, but it may include a small contribution (up to 2 dS/m) from dissolved gypsum. The standard international unit of measure is decisiemens per meter (dS/m) corrected to a temperature of 25 degrees C. Millimhos per centimeter (mmhos/cm) means the same as dS/m and may still be used. If it has been measured, the electrical conductivity is reported in soil descriptions. The following classes of salinity

are used if the electrical conductivity has not been determined, but salinity is inferred:

Class	Electrical conductivity dS/m (mmhos/cm)
0 (Nonsaline)	0 to 2
1 (Very slightly saline)	2 to 4
2 (Slightly saline)	4 to 8
3 (Moderately saline)	8 to 16
4 (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 from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In

this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Strongly sloping	5 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 40 percent
Very steep	40 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat. The names and percent surface coverage and distance, in meters, between stones or boulders are as follows:

Stony or bouldery.—Stones or boulders cover about 0.01 to 0.1 percent of the surface. Stones of the smallest sizes are at least 8 meters apart; boulders of the smallest sizes are at least 20 meters apart.

Very stony or very bouldery.—Stones or boulders cover about 0.1 to 3 percent of the surface. Stones of the smallest sizes are not less than 1 meter apart; boulders of the smallest sizes are no less than 3 meters apart.

Extremely stony or extremely bouldery.—Stones or boulders cover about 3 to 15 percent of the surface. Stones of the smallest sizes are as little as 0.5 meter apart; boulders of the smallest sizes are as little as 1 meter apart.

Rubbly.—Stones or boulders cover about 15 to 50 percent of the surface. Stones of the smallest sizes are as little as 0.3 meter apart; boulders of the smallest sizes are as little as 0.5 meter apart. In most places it is possible to step from stone to stone or jump from boulder to bouder without touching the ground.

Very rubbly.—Stones or boulders apprear to be nearly continuous and cover about 50 to 90 percent of the surface. Stones of the smallest sizes are less than 0.03 meter apart; boulders of the smallest sizes are less than 0.05 meter apart. Classifiable soils are among the rock fragments, and plants can grow if not otherwise limited.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide

vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

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.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil

normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Rainfall, Temperature, and Potential Evapotranspiration

Month	Mean total rainfall	Mean air temperature	Potential evapotrans-piration
	In	°F	In
January	2.60	76.2	3.89
February	1.84	76.2	3.67
March	2.09	76.9	4.45
April	2.89	78.0	4.96
May	4.55	79.4	5.94
June	2.96	81.0	6.27
July	3.19	82.0	6.55
August	4.57	82.0	6.40
September	5.67	81.0	5.85
October	5.82	80.4	5.69
November	6.08	78.8	4.90
December	3.76	76.9	4.27
Total	---	---	62.78

Table 2.--Mean Relative Humidity

Month	Mean relative humidity	
	2:30 a.m.	2:30 p.m.
	Pct	Pct
January	81	66
February	84	63
March	83	63
April	85	70
May	87	69
June	84	70
July	86	69
August	87	73
September	88	72
October	90	72
November	90	69
December	86	69
Annual	86	69

Table 3.--Monthly Wind Patterns

Months	Type of wind	Wind direction	Wind speed	Percentage of time that winds are blowing
			Knots	Pct
December to February:				
	Tradewinds	East-northeast	10-20	60
			>20	25
	*Christmas winds	North	>20	**
March to May	Tradewinds	East	>20	13
June to August	Tradewinds	East and east-southeast	>20	20
September to November	Tradewinds	East and southeast	>20	7

* Christmas winds repeatedly interrupt the normal tradewind pattern for several days at a time from December to February.

** The Christmas winds blow constantly for the duration of the outbreak.

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AcD	Annaberg-Cramer complex, 12 to 20 percent slopes, extremely stony	377	0.4
AcE	Annaberg-Cramer complex, 20 to 40 percent slopes, extremely stony	1,313	1.6
AcF	Annaberg-Cramer complex, 40 to 60 percent slopes, extremely stony	3,272	3.9
AcG	Annaberg-Cramer complex, 60 to 90 percent slopes, extremely stony	2,708	3.2
AmD	Annaberg-Maho Bay complex, 12 to 20 percent slopes, extremely stony	176	0.2
AmE	Annaberg-Maho Bay complex, 20 to 40 percent slopes, extremely stony	1,127	1.3
AmF	Annaberg-Maho Bay complex, 40 to 60 percent slopes, extremely stony	1,483	1.8
AmG	Annaberg-Maho Bay complex, 60 to 90 percent slopes, extremely stony	1,052	1.2
AqA	Aquents, 0 to 2 percent slopes, ponded	566	0.7
ArB	Arawak gravelly loam, 2 to 5 percent slopes, very stony	394	0.5
ArC	Arawak gravelly loam, 5 to 12 percent slopes, very stony	1,831	2.2
ArD	Arawak gravelly loam, 12 to 20 percent slopes, very stony	1,859	2.2
ArE	Arawak gravelly loam, 20 to 40 percent slopes, very stony	1,366	1.6
ArF	Arawak gravelly loam, 40 to 70 percent slopes, very stony	787	0.9
BrB	Beaches, rock outcrop	69	0.1
BsB	Beaches, sandy	476	0.6
BtB	Beaches, stony	532	0.6
CaA	Carib clay loam, 0 to 2 percent slopes, frequently flooded	84	0.1
CbB	Cinnamon Bay loam, 0 to 5 percent slopes, occasionally flooded	384	0.5
CgC	Cinnamon Bay gravelly loam, 5 to 12 percent slopes, occasionally flooded	706	0.8
CvC	Cramer-Victory complex, 2 to 12 percent slopes, very stony	1,214	1.4
CvD	Cramer-Victory complex, 12 to 20 percent slopes, very stony	1,086	1.3
CvE	Cramer-Victory complex, 20 to 40 percent slopes, very stony	1,689	2.0
CvF	Cramer-Victory complex, 40 to 70 percent slopes, very stony	610	0.7
DoE	Dorothea-Susannaberg complex, 20 to 40 percent slopes, extremely stony	623	0.7
DoF	Dorothea-Susannaberg complex, 40 to 60 percent slopes, extremely stony	1,624	1.9
DoG	Dorothea-Susannaberg complex, 60 to 90 percent slopes, extremely stony	1,329	1.6
FsD	Fredriksdal-Susannaberg complex, 12 to 20 percent slopes, extremely stony	437	0.5
FsE	Fredriksdal-Susannaberg complex, 20 to 40 percent slopes, extremely stony	3,040	3.6
FsF	Fredriksdal-Susannaberg complex, 40 to 60 percent slopes, extremely stony	4,398	5.2
FsG	Fredriksdal-Susannaberg complex, 60 to 90 percent slopes, extremely stony	2,505	3.0
GyA	Glynn gravelly loam, 0 to 2 percent slopes, rarely flooded	1,058	1.3
GyB	Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded	4,748	5.5
GyC	Glynn gravelly loam, 5 to 12 percent slopes, rarely flooded	2,038	2.4
HeA	Hesselberg clay, 0 to 2 percent slopes	423	0.5
HeB	Hesselberg clay, 2 to 5 percent slopes	1,930	2.3
HeC	Hesselberg clay, 5 to 12 percent slopes	1,175	1.4
HgA	Hogensborg clay loam, 0 to 2 percent slopes, rarely flooded	1,178	1.4
HgB	Hogensborg clay loam, 2 to 5 percent slopes, rarely flooded	957	1.1
HgC	Hogensborg clay loam, 5 to 12 percent slopes, rarely flooded	83	0.1
JaB	Jaucas sand, 0 to 5 percent slopes, rarely flooded	398	0.5
JsD	Jealousy-Southgate complex, 12 to 20 percent slopes	149	0.2
JsE	Jealousy-Southgate complex, 20 to 40 percent slopes	226	0.3
JsF	Jealousy-Southgate complex, 40 to 70 percent slopes	330	0.4
LmC	Lameshur gravelly sandy loam, 2 to 12 percent slopes, rubbly, occasionally flooded	162	0.2
PaB	Parasol clay loam, 2 to 5 percent slopes	42	*
PaC	Parasol clay loam, 5 to 12 percent slopes	149	0.2
Pt	Pits, quarries	170	0.2
RdB	Redhook extremely stony sand, 0 to 5 percent slopes, rubbly, rarely flooded	190	0.2
SaA	Salt flats, ponded	642	0.8
SBA	Sandy Point and Sugar Beach soils, 0 to 2 percent slopes, frequently flooded	820	1.0
SiA	Sion clay, 0 to 2 percent slopes, rarely flooded	444	0.5
SiB	Sion clay, 2 to 5 percent slopes, rarely flooded	1,956	2.3
SoA	Solitude gravelly fine sandy loam, 0 to 2 percent slopes, frequently flooded	1,688	2.0
SrD	Southgate-Rock outcrop complex, 12 to 20 percent slopes	450	0.5
SrE	Southgate-Rock outcrop complex, 20 to 40 percent slopes	3,136	3.7
SrF	Southgate-Rock outcrop complex, 40 to 60 percent slopes	3,749	4.4
SrG	Southgate-Rock outcrop complex, 60 to 90 percent slopes	1,915	2.3
UbD	Urban land	1,930	2.3
UcC	Urban land-Cinnamon Bay complex, 0 to 12 percent slopes, occasionally flooded	240	0.3
UgC	Urban land-Glynn complex, 0 to 12 percent slopes, rarely flooded	241	0.3
Us	Ustorthents	790	0.9

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
VsC	Victory-Southgate complex, 2 to 12 percent slopes, very stony	318	0.4
VsD	Victory-Southgate complex, 12 to 20 percent slopes, very stony	336	0.4
VsE	Victory-Southgate complex, 20 to 40 percent slopes, very stony	2,010	2.4
VsF	Victory-Southgate complex, 40 to 70 percent slopes, very stony	8,835	10.4
M-W	Miscellaneous water	140	0.2
W	Water	317	0.4
	Total	84,480	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Rangeland

(Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Soil name and map symbol	Land capability		Bananas		Mangos		Peppers, green		Tomatoes		Buffel grass		Guinea grass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 Cwt	1,000 Cwt	Cwt	Cwt	Tons	Tons	Tons	Tons
AcD, AcE:														
Annaberg	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
Cramer	VIs	---	---	---	---	---	---	---	---	---	5	---	8	---
AcF, AcG	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Annaberg-Cramer														
AmD, AmE	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
Annaberg-Maho Bay														
AmF, AmG	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Annaberg-Maho Bay														
AqA	VIIIw	---	---	---	---	---	---	---	---	---	---	---	---	---
Aquents														
ArB, ArC	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
Arawak														
ArD	VIs	---	---	---	---	---	---	---	---	---	2	---	4	---
Arawak														
ArE	VIIs	---	---	---	---	---	---	---	---	---	1	---	2	---
Arawak														
ArF	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Arawak														
BrB*, BsB*, BtB*	VIIIw	---	---	---	---	---	---	---	---	---	---	---	---	---
Beaches														
CaA	IIIw	IIIw	6	25	2	7	1	5	40	200	7	---	10	---
Carib														
CbB	IIc	IIe	7	32	2	9	2	7	60	240	5	---	8	---
Cinnamon Bay														
CgC	IIIe	IIIe	7	32	2	9	2	7	60	240	5	---	8	---
Cinnamon Bay														
CvC, CvD, CvE	VIs	---	---	---	---	---	---	---	---	---	5	---	8	---
Cramer-Victory														
CvF	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Cramer-Victory														
DoE	VIs	---	---	---	---	---	---	---	---	---	5	---	8	---
Dorothea-Susannaberg														
DoF, DoG	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Dorothea-Susannaberg														

*** See footnote at end of table.**

Table 5.--Land Capability and Yields per Acre of Crops and Rangeland--Continued

Soil name and map symbol	Land capability		Bananas		Mangos		Peppers, green		Tomatoes		Buffel grass		Guinea grass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 Cwt	1,000 Cwt	Cwt	Cwt	Tons	Tons	Tons	Tons
FsD, FsE:														
Fredricksdal-----	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
Susannaberg------	VIs	---	---	---	---	---	---	---	---	---	5	---	8	---
FsF, FsG----------	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Fredriksdal-Susannaberg														
GyA---------------	IIc	IIs	6	25	2	7	1	5	40	200	5	---	8	---
Glynn														
GyB---------------	IIc	IIe	6	25	2	7	1	5	40	200	5	---	8	---
Glynn														
GyC---------------	IIIe	IIIe	4	20	1	6	1	4	40	160	5	---	8	---
Glynn														
HeA, HeB, HeC-----	IIIc	IIs	4	20	1	5	1	4	40	120	4	---	6	---
Hesselberg														
HgA, HgB----------	IIIc	IIs	4	20	1	5	1	4	40	120	6	---	9	---
Hogensborg														
HgC---------------	IIIc	IIs	3	16	1	4	1	3	40	100	5	---	7	---
Hogensborg														
JaB---------------	VIIs	---	---	---	---	---	---	---	---	---	3	---	1	5
Jaucas														
JsD:														
Jealousy---------	IVe	---	---	---	---	---	---	---	---	---	5	---	8	---
Southgate--------	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
JsE:														
Jealousy---------	VIe	---	---	---	---	---	---	---	---	---	4	---	6	---
Southgate--------	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
JsF:														
Jealousy---------	VIIe	---	---	---	---	---	---	---	---	---	---	---	---	---
Southgate--------	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
LmC---------------	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Lameshur														
PaB---------------	IIc	IIe	7	36	2	9	1	6	100	260	4	---	6	---
Parasol														
PaC---------------	IIIe	IIIe	6	34	2	9	1	5	100	260	4	---	6	---
Parasol														
Pt*---------------	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Pits														
RdB---------------	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Redhook														

* See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Rangeland--Continued

Soil name and map symbol	Land capability		Bananas		Mangos		Peppers, green		Tomatoes		Buffel grass		Guinea grass	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I
			1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 Cwt	1,000 Cwt	Cwt	Cwt	Tons	Tons	Tons	Tons
SaA*--Salt flats	VIIIw	---	---	---	---	---	---	---	---	---	---	---	---	---
SBA--Sandy Point and Sugar Beach	VIIIw	---	---	---	---	---	---	---	---	---	---	---	---	---
SiA--Sion	IIIc	IIs	6	34	2	9	1	5	5	13	6	---	9	---
SiB--Sion	IIIc	IIe	6	34	2	9	1	5	5	13	6	---	9	---
SoA--Solitude	IVw	---	---	---	---	---	---	---	---	---	7	---	10	---
SrD*, SrE*--Southgate-Rock outcrop	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
SrF*, SrG*--Southgate-Rock outcrop	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
UbD*--Urban land	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
UcC--Urban land-Cinnamon Bay	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
UgC--Urban land-Glynn	VIIIs	---	---	---	---	---	---	---	---	---	---	---	---	---
Us*--Ustorthents	VIe	---	---	---	---	---	---	---	---	---	---	---	---	---
VsC:														
Victory	VIs	---	---	---	---	---	---	---	---	---	4	---	8	---
Southgate	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
VsD, VsE:														
Victory	VIs	---	---	---	---	---	---	---	---	---	4	---	8	---
Southgate	VIs	---	---	---	---	---	---	---	---	---	4	---	6	---
VsF--Victory-Southgate	VIIs	---	---	---	---	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 6.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
CaA	Carib clay loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
CbB	Cinnamon Bay loam, 0 to 5 percent slopes, occasionally flooded (where irrigated)
CgC	Cinnamon Bay gravelly loam, 5 to 12 percent slopes, occasionally flooded (where irrigated)
GyA	Glynn gravelly loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
GyB	Glynn gravelly loam, 2 to 5 percent slopes, rarely flooded (where irrigated)
GyC	Glynn gravelly loam, 5 to 12 percent slopes, rarely flooded (where irrigated)
PaB	Parasol clay loam, 2 to 5 percent slopes (where irrigated)
PaC	Parasol clay loam, 5 to 12 percent slopes (where irrigated)
SiA	Sion clay, 0 to 2 percent slopes, rarely flooded (where irrigated)
SiB	Sion clay, 2 to 5 percent slopes, rarely flooded (where irrigated)

Table 7.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AcD*:					
Annaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
Cramer	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
AcE*, AcF*, AcG*:					
Annaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
Cramer	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
AmD*:					
Annaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
Maho Bay	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
AmE*, AmF*, AmG*:					
Annaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
Maho Bay	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
AqA	Severe: flooding, ponding, excess salt.	Severe: ponding, excess salt.	Severe: ponding, flooding, excess salt.	Severe: ponding.	Severe: excess salt, ponding, flooding.
ArB	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight	Severe: droughty, depth to rock.
ArC	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: droughty, depth to rock.

See footnote at end of table.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArD Arawak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
ArE, ArF Arawak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
BrB* Beaches	Severe: flooding, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: flooding.	Severe: flooding, depth to rock.
BsB* Beaches	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy, excess salt.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: excess salt, wetness, droughty.
BtB* Beaches	Severe: flooding, large stones, small stones.	Severe: wetness, large stones, too sandy.	Severe: large stones, small stones, too sandy.	Severe: large stones, wetness, too sandy.	Severe: small stones, large stones, wetness.
CaA Carib	Severe: flooding.	Moderate: flooding, wetness, percs slowly.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
CbB Cinnamon Bay	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
CgC Cinnamon Bay	Severe: flooding.	Moderate: slope.	Severe: slope.	Slight	Moderate: flooding, slope.
CvC*:					
Cramer	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: droughty, depth to rock.
Victory	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
CvD*:					
Cramer	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
Victory	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.

See footnote at end of table.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CvE*, CvF*:					
Cramer	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
Victory	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
DoE*, DoF*, DoG*:					
Dorothea	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Susannaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
FsD*:					
Fredriksdal	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
Susannaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
FsE*, FsF*, FsG*:					
Fredriksdal	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
Susannaberg	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
GyA, GyB	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
GyC	Severe: flooding.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
HeA, HeB	Severe: cemented pan.	Severe: cemented pan.	Severe: cemented pan.	Moderate: too clayey.	Severe: cemented pan, too clayey.
HeC	Severe: cemented pan.	Severe: cemented pan.	Severe: slope, cemented pan.	Moderate: too clayey.	Severe: cemented pan, too clayey.
HgA	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.

See footnote at end of table.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HgB Hogensborg	Severe: flooding.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
HgC Hogensborg	Severe: flooding.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
JaB Jaucas	Severe: flooding, too sandy, excess salt.	Severe: too sandy, excess salt.	Severe: too sandy, excess salt.	Severe: too sandy.	Severe: excess salt, droughty.
JsD*: Jealousy	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
JsE*, JsF*: Jealousy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
LmC Lameshur	Severe: flooding, stones.	Severe: stones.	Severe: slope, stones.	Slight	Severe: small stones.
PaB Parasol	Slight	Slight	Moderate: slope.	Slight	Slight.
PaC Parasol	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Pt* Pits	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
RdB Redhook	Severe: flooding, large stones, small stones.	Severe: large stones, too sandy, small stones.	Severe: large stones, small stones, too sandy.	Severe: too sandy, small stones.	Severe: excess salt, small stones, droughty.
SaA* Salt flats	Severe: flooding, ponding, percs slowly.	Severe: ponding, excess salt.	Severe: ponding, flooding.	Severe: ponding, erodes easily.	Severe: excess salt, ponding, droughty.
SBA*: Sandy Point	Severe: flooding, ponding, excess salt.	Severe: ponding, excess salt.	Severe: ponding, flooding, excess salt.	Severe: ponding.	Severe: excess salt, ponding, flooding.

See footnote at end of table.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SBA*:					
Sugar Beach	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess salt, ponding, flooding.
SiA	Severe: flooding.	Moderate: too clayey.	Moderate: small stones, too clayey.	Moderate: too clayey.	Severe: too clayey.
SiB	Severe: flooding.	Moderate: too clayey.	Moderate: slope, small stones, too clayey.	Moderate: too clayey.	Severe: too clayey.
SoA	Severe: flooding, wetness, excess salt.	Severe: excess salt.	Severe: small stones, wetness, flooding.	Moderate: wetness, flooding.	Severe: excess salt, droughty, flooding.
SrD*:					
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: depth to rock.
SrE*, SrF*, SrG*:					
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.
Rock outcrop	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock.
UbD*	Variable	Variable	Variable	Variable	Variable.
Urban land					
UcC*:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Cinnamon Bay	Severe: flooding.	Slight	Severe: slope.	Slight	Moderate: flooding.
UgC*:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Glynn	Severe: flooding.	Moderate: small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Us	Variable	Variable	Variable	Variable	Variable.
Ustorthents					

See footnote at end of table.

Table 7.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
VsC*:					
Victory	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight	Severe: droughty.
Southgate	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: droughty, depth to rock.
VsD*:					
Victory	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, slope, depth to rock.
VsE*, VsF*:					
Victory	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
Southgate	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, slope, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Wildlife Habitat

(See text for definitions of "well suited," "suited," and "poorly suited." Absence of an entry indicates the soil was not rated.)

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
AcD*, AcE*:						
Annaberg	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Cramer	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
AcF*, AcG*:						
Annaberg	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Cramer	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, erodes easily.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
AmD*, AmE*:						
Annaberg	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Maho Bay	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
AmF*, AmG*:						
Annaberg	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Maho Bay	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty,	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water	Poorly suited: deep to water.
AqA---------- Aquents	Poorly suited: wetness, ponding	Poorly suited: wetness, ponding	Poorly suited: excess salt, excess sodium, wetness	Poorly suited: excess salt, wetness	Poorly suited: excess salt, excess sodium	Well suited
ArB, ArC---------- Arawak	Poorly suited: droughty, rooting depth.	Poorly suited: droughty, rooting depth.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.

See footnote at end of table.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
ArD, ArE---------- Arawak	Poorly suited: droughty, rooting depth erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
ArF---------- Arawak	Poorly suited: droughty, rooting depth slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
BrB---------- Beaches	Poorly suited: rooting depth.	Poorly suited: rooting depth.	Poorly suited: droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water, excess salt.	Poorly suited: deep to water.
BsB---------- Beaches	Poorly suited: too sandy, droughty, wetness.	Poorly suited: too sandy, droughty, wetness.	Poorly suited: too sandy, droughty, excess salt.	Poorly suited: too sandy, droughty, excess salt.	Poorly suited: too sandy, excess salt.	Poorly suited: too sandy.
BtB---------- Beaches	Poorly suited: too sandy, too stony, droughty.	Poorly suited: too sandy, too stony, droughty.	Poorly suited: too sandy, droughty, excess salt.	Poorly suited: too sandy, droughty, excess salt.	Poorly suited: too sandy, excess salt.	Poorly suited: too sandy.
CaA---------- Carib	Suited: wetness, flooding.	Suited: wetness, flooding.	Suited: wetness.	Suited: wetness.	Suited: deep to water.	Poorly suited: low salt, low sodium.
CbA, CbB, CgC----- Cinnamon Bay	Suited: Flooding.	Suited: flooding.	Well suited----	Well suited----	Poorly suited: deep to water.	Poorly suited: deep to water.
CvC*:						
Cramer----------	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited: too clayey.	Poorly suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Victory----------	Suited: droughty, rooting depth, erodes easily.	Suited: rooting depth, erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
CvD*, CvE*:						
Cramer----------	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited too clayey.	Poorly suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Victory----------	Poorly suited: erodes easily.	Poorly suited: erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
CvF*:						
Cramer----------	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited too clayey.	Poorly suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.

See footnote at end of table.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
CvF*:						
Victory	Poorly suited: slope, erodes easily.	Poorly suited: slope, erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
DoE*:						
Dorothea	Poorly suited: erodes easily.	Poorly suited: erodes easily.	Suited: too clayey.	Suited: too clayey.	Poorly suited: deep to water.	Poorly suited: deep to water.
Susannaberg	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
DoF*, DoG*:						
Dorothea	Poorly suited: slope, erodes easily.	Poorly suited: slope, erodes easily.	Suited: too clayey.	Suited: too clayey.	Poorly suited: deep to water.	Poorly suited: deep to water.
Susannaberg	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, erodes easily.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
FsD*, FsE*:						
Fredriksdal	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Susannaberg	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
FsF*, FsG*:						
Fredriksdal	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Susannaberg	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Suited: too clayey, droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
GyA, GyB	Suited: droughty.	Suited: droughty.	Well suited	Well suited	Poorly suited: deep to water.	Poorly suited: deep to water.
Glynn						
GyC	Suited: droughty, erodes easily.	Suited: droughty, erodes easily.	Well suited	Well suited	Poorly suited: deep to water.	Poorly suited: deep to water.
Glynn						
HeA, HeB, HeC	Poorly suited: too clayey, droughty, rooting depth.	Poorly suited: too clayey, rooting depth.	Poorly suited: too clayey, rooting depth.	Poorly suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Hesselberg						

See footnote at end of table.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
HgA, HgB, HgC----- Hogensborg	Suited: too clayey, percs slowly.	Suited: too clayey, percs slowly.	Suited: too clayey, excess sodium.	Suited: too clayey.	Poorly suited: deep to water.	Poorly suited: deep to water.
JaB---------- Jaucas	Poorly suited: too sandy, droughty.	Poorly suited: too sandy, droughty.	Poorly suited: too sandy, droughty.	Poorly suited: too sandy, droughty.	Poorly suited: deep to water.	Poorly suited: deep to water.
JsD*, JsE*:						
Jealousy---------	Poorly suited: erodes easily.	Poorly suited: erodes easily.	Suited: too clayey.	Suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Southgate--------	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
JsF*:						
Jealousy---------	Poorly suited: slope, erodes easily.	Poorly suited: slope, erodes easily.	Suited: too clayey.	Suited: too clayey, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Southgate--------	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
LmC---------- Lameshur	Poorly suited: too stony.	Poorly suited: too stony.	Suited: droughty, too stony.	Suited: droughty, too stony.	Poorly suited: deep to water.	Poorly suited: deep to water.
PaB, PaC---------- Parasol	Suited: too clayey, erodes easily.	Suited: too clayey, erodes easily.	Suited: too clayey.	Suited: too clayey.	Poorly suited: deep to water.	Poorly suited: deep to water.
Pt---------- Pits	Poorly suited: droughty, rooting depth.	Poorly suited: droughty, rooting depth.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
RdB---------- Redhook	Poorly suited: too sandy, too stony, droughty.	Poorly suited: too sandy, too stony, droughty.	Poorly suited: too sandy, droughty, too stony.	Poorly suited: too sandy, droughty, too stony.	Poorly suited: deep to water.	Poorly suited: deep to water.
SaA---------- Salt flats	Poorly suited: wetness, ponding, excess salt.	Poorly suited: wetness, ponding, excess salt.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium.	Suited: ponding.
SBA*:						
Sandy Point------	Poorly suited: wetness, ponding, flooding.	Poorly suited: wetness, ponding, flooding.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium.	Well suited.

See footnote at end of table.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
SBA*:						
Sugar Beach	Poorly suited: wetness, ponding, flooding.	Poorly suited: wetness, ponding, flooding.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium, wetness.	Poorly suited: excess salt, excess sodium.	Well suited.
SiA, SiB	Poorly suited:	Poorly suited:	Poorly suited:	Poorly suited:	Poorly suited:	Poorly suited:
Sion	too clayey.	too clayey.	too clayey.	too clayey.	deep to water.	deep to water.
SoA	Poorly suited:	Poorly suited:	Poorly suited:	Poorly suited:	Poorly suited:	Suited:
Solitude	flooding, excess salt.	flooding, excess salt.	excess salt, excess sodium.	excess salt, excess sodium.	excess salt, excess sodium.	deep to water.
SrD*, SrE*:						
Southgate	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Rock outcrop	Poorly suited: rooting depth.	Poorly suited: rooting depth.	Poorly suited: droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
SrF*, SrG*:						
Southgate	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Rock outcrop	Poorly suited: rooting depth, slope.	Poorly suited: rooting depth, slope.	Poorly suited: droughty.	Poorly suited: rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
UbD	Variable	Variable	Variable	Variable	Poorly suited:	Poorly suited:
Urban Land					deep to water.	deep to water.
UcC*:						
Urban land	Variable	Variable	Variable	Variable	Poorly suited: deep to water.	Poorly suited: deep to water.
Cinnamon Bay	Suited: Flooding.	Suited: flooding.	Well suited	Well suited	Poorly suited: deep to water.	Poorly suited: deep to water.
UgC*:						
Urban land	Variable	Variable	Variable	Variable	Poorly suited: deep to water.	Poorly suited: deep to water.
Glynn	Suited: droughty.	Suited: droughty.	Well suited	Well suited	Poorly suited: deep to water.	Poorly suited: deep to water.
Us	Variable	Variable	Variable	Variable	Variable	Variable.
Ustorthents						
VsC*:						
Victory	Suited: droughty, rooting depth.	Suited: rooting depth, erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Southgate	Poorly suited: droughty, rooting depth.	Poorly suited: droughty, rooting depth.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.

See footnote at end of table.

Table 8.--Wildlife Habitat--Continued

Soil name and map symbol	Grain and seed crops	Domestic grasses and legumes	Upland wild herbaceous plants	Upland shrubs and vines	Fresh water wetland plants	Saline water wetland plants
VsD*, VsE*:						
Victory	Poorly suited: erodes easily.	Poorly suited: erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Southgate	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty, rooting depth, erodes easily.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
VsF*:						
Victory	Poorly suited: slope, erodes easily.	Poorly suited: slope, erodes easily.	Suited: droughty.	Suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.
Southgate	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty, rooting depth, slope.	Poorly suited: droughty.	Poorly suited: droughty, rooting depth.	Poorly suited: deep to water.	Poorly suited: deep to water.

* See description of the map unit for the behavior and characteristics of the map unit.

Table 9.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AcD*, AcE*, AcF*, AcG*:						
Annaberg	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Cramer	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: droughty, slope, depth to rock.
AmD*, AmE*, AmF*, AmG*:						
Annaberg	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Maho Bay	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: droughty, slope, depth to rock.
AqA--- Aquents	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: excess salt, ponding, flooding.
ArB--- Arawak	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Severe: droughty, depth to rock.
ArC--- Arawak	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: droughty, depth to rock.
ArD, ArE, ArF--- Arawak	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope, depth to rock.
BrB*--- Beaches	Severe: depth to rock.	Severe: flooding, depth to rock.	Severe: flooding, depth to rock.	Severe: flooding, depth to rock.	Severe: depth to rock.	Severe: flooding, depth to rock.
BsB*--- Beaches	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, wetness, droughty.
BtB*--- Beaches	Severe: cutbanks cave, large stones, wetness.	Severe: flooding, wetness, large stones.	Severe: flooding, wetness, large stones.	Severe: flooding, wetness, large stones.	Severe: wetness, flooding, large stones.	Severe: small stones, large stones, wetness.

See footnote at end of table.

Table 9.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CaA--Carib	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
CbB--Cinnamon Bay	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
CgC--Cinnamon Bay	Moderate: flooding, slope.	Severe: flooding.	Severe: flooding.	Severe: flooding, slope.	Severe: flooding.	Moderate: flooding, slope.
CvC*:						
Cramer	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: droughty, depth to rock.
Victory	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Slight	Severe: droughty.
CvD*, CvE*, CvF*:						
Cramer	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: droughty, slope, depth to rock.
Victory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
DoE*, DoF*, DoG*:						
Dorothea	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell.	Severe: low strength, slope.	Severe: slope.
Susannaberg	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: droughty, slope, depth to rock.
FsD*, FsE*, FsF*, FsG*:						
Fredriksdal	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: droughty, slope, depth to rock.
Susannaberg	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: droughty, slope, depth to rock.
GyA, GyB--Glynn	Moderate: too clayey.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, flooding.	Moderate: small stones, droughty.
GyC--Glynn	Moderate: too clayey, slope.	Severe: flooding.	Severe: flooding.	Severe: flooding, slope.	Moderate: shrink-swell, slope, flooding.	Moderate: small stones, droughty, slope.

See footnote at end of table.

Table 9.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HeA, HeB---------- Hesselberg	Severe: cemented pan.	Moderate: cemented pan.	Severe: cemented pan.	Moderate: cemented pan.	Moderate: cemented pan.	Severe: cemented pan, too clayey.
HeC---------- Hesselberg	Severe: cemented pan.	Moderate: slope, cemented pan.	Severe: cemented pan.	Severe: slope.	Moderate: cemented pan, slope.	Severe: cemented pan, too clayey.
HgA, HgB---------- Hogensborg	Severe: cutbanks cave.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Slight.
HgC---------- Hogensborg	Severe: cutbanks cave.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
JaB---------- Jaucas	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Severe: excess salt, droughty.
JsD*, JsE*, JsF*:						
Jealousy---------	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope.
Southgate--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
LmC---------- Lameshur	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Severe: small stones.
PaB---------- Parasol	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength.	Slight.
PaC---------- Parasol	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Pt*---------- Pits	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
RdB---------- Redhook	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Severe: excess salt, small stones, droughty.
SaA*---------- Salt flats	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, ponding, droughty.
SBA*:						
Sandy Point------	Severe: excess humus, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: excess salt, ponding, flooding.

See footnote at end of table.

Table 9.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SBA*:						
Sugar Beach	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: excess salt, ponding, flooding.
SiA, SiB	Slight	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Severe: too clayey.
Sion						
SoA	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: excess salt, droughty, flooding.
Solitude						
SrD*, SrE*, SrF*, SrG*:						
Southgate	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Rock outcrop	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
UbD*	Variable	Variable	Variable	Variable	Variable	Variable.
Urban land						
UcC*:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Cinnamon Bay	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
UgC*:						
Urban land	Variable	Variable	Variable	Variable	Variable	Variable.
Glynn	Moderate: too clayey.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, flooding.	Moderate: small stones, droughty.
Us	Variable	Variable	Variable	Variable	Variable	Variable.
Ustorthents						
VsC*:						
Victory	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Slight	Severe: droughty.
Southgate	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: droughty, depth to rock.
VsD*, VsE*, VsF*:						
Victory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Southgate	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.

* See desription of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AcD*, AcE*, AcF*, AcG*:					
Annaberg	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Cramer	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
AmD*, AmE*, AmF*, AmG*:					
Annaberg	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Maho Bay	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
AqA---- Aquents	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, excess salt.	Severe: flooding, ponding.	Poor: ponding, excess salt.
ArB---- Arawak	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
ArC---- Arawak	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
ArD, ArE, ArF---- Arawak	Severe: depth to rock, slope, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
BrB*---- Beaches	Severe: flooding, depth to rock.	Severe: depth to rock, flooding.	Severe: flooding, depth to rock.	Severe: flooding, depth to rock.	Poor: depth to rock.
BsB*---- Beaches	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
BtB*---- Beaches	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: too sandy, small stones, large stones.

See footnote at end of table.

Table 10.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CaA Carib	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
CbB Cinnamon Bay	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: small stones.
CgC Cinnamon Bay	Severe: flooding.	Severe: flooding, slope.	Severe: flooding.	Severe: flooding.	Fair: small stones, slope.
CvC*: Cramer	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Victory	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
CvD*, CvE*, CvF*: Cramer	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Victory	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
DoE*, DoF*, DoG*: Dorothea	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: hard to pack, slope.
Susannaberg	Severe: percs slowly, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
FsD*, FsE*, FsF*, FsG*: Fredriksdal	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Susannaberg	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
GyA Glynn	Severe: percs slowly.	Moderate: seepage.	Severe: too clayey.	Moderate: flooding.	Poor: too clayey.
GyB Glynn	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Moderate: flooding.	Poor: too clayey.

See footnote at end of table.

Table 10.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GyC--Glynn	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: flooding, slope.	Poor: too clayey.
HeA, HeB--Hesselberg	Severe: cemented pan, percs slowly.	Severe: cemented pan.	Moderate: cemented pan.	Severe: cemented pan.	Poor: cemented pan.
HeC--Hesselberg	Severe: cemented pan, percs slowly.	Severe: cemented pan, slope.	Moderate: cemented pan, slope.	Severe: cemented pan.	Poor: cemented pan.
HgA--Hogensborg	Severe: percs slowly.	Slight	Severe: too clayey.	Moderate: flooding.	Poor: too clayey, hard to pack.
HgB--Hogensborg	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: flooding.	Poor: too clayey, hard to pack.
HgC--Hogensborg	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: flooding, slope.	Poor: too clayey, hard to pack.
JaB--Jaucas	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
JsD*, JsE*, JsF*:					
Jealousy	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Southgate	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
LmC--Lameshur	Severe: flooding.	Severe: seepage, flooding, slope.	Severe: seepage, flooding.	Severe: seepage, flooding.	Poor: seepage, small stones.
PaB--Parasol	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too sandy.
PaC--Parasol	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too sandy, slope.
Pt*--Pits	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
RdB--Redhook	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

Table 10.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SaA* Salt flats	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
SBA*:					
Sandy Point	Severe: flooding, ponding, percs slowly.	Severe: flooding, excess humus, ponding.	Severe: flooding, ponding, excess salt.	Severe: flooding, ponding.	Poor: ponding, excess salt.
Sugar Beach	Severe: subsides, flooding, ponding.	Severe: flooding, excess humus, ponding.	Severe: flooding, ponding, excess humus.	Severe: flooding, ponding.	Poor: ponding, excess humus, excess salt.
SiA Sion	Severe: percs slowly.	Moderate: seepage.	Moderate: flooding.	Moderate: flooding.	Good.
SiB Sion	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: flooding.	Moderate: flooding.	Good.
SoA Solitude	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, excess salt.	Severe: flooding, wetness.	Poor: small stones, wetness, excess salt.
SrD*, SrE*, SrF*, SrG*:					
Southgate	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Rock outcrop	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, slope.
UbD* Urban land	Variable	Variable	Variable	Variable	Variable.
UcC*:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Cinnamon Bay	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: small stones.
UgC*:					
Urban land	Variable	Variable	Variable	Variable	Variable.
Glynn	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Moderate: flooding.	Poor: too clayey.
Us Ustorthents	Variable	Variable	Variable	Variable	Variable.
VsC*:					
Victory	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.

See footnote at end of table.

Table 10.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
VsC*:					
Southgate	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
VsD*, VsE*, VsF*:					
Victory	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Southgate	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AcD*:				
Annaberg	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Cramer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
AcE*, AcF*, AcG*:				
Annaberg	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Cramer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
AmD*:				
Annaberg	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Maho Bay	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
AmE*, AmF*, AmG*:				
Annaberg	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Maho Bay	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
AqA	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
Aquents				
ArB, ArC	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Arawak				

See footnote at end of table.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ArD Arawak	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
ArE, ArF Arawak	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
BrB* Beaches	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
BsB* Beaches	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, excess salt.
BtB* Beaches	Poor: large stones, wetness.	Improbable: large stones.	Improbable: large stones.	Poor: too sandy, large stones, small stones.
CaA Carib	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
CbB, CgC Cinnamon Bay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
CvC*: Cramer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Victory	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CvD*: Cramer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Victory	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CvE*, CvF*: Cramer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Victory	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DoE*, DoF*, DoG*:				
Dorothea	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Susannaberg	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
FsD*, FsE*, FsF*, FsG*:				
Fredriksdal	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Susannaberg	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
GyA, GyB, GyC	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Glynn				
HeA, HeB, HeC	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: cemented pan.
Hesselberg				
HgA, HgB, HgC	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Hogensborg				
JaB	Good	Probable	Improbable: too sandy.	Poor: too sandy, excess salt.
Jaucas				
JsD*:				
Jealousy	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Southgate	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
JsE*, JsF*:				
Jealousy	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Southgate	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
LmC	Good	Improbable: small stones.	Probable	Poor: small stones.
Lameshur				

See footnote at end of table.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PaB, PaC---------- Parasol	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Pt*---------- Pits	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
RdB---------- Redhook	Good----------	Probable----------	Probable----------	Poor: too sandy, small stones.
SaA*---------- Salt flats	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
SBA*:				
Sandy Point----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
Sugar Beach----------	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, excess salt, wetness.
SiA, SiB---------- Sion	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
SoA---------- Solitude	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, excess salt.
SrD*:				
Southgate----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop---------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
SrE*, SrF*, SrG*:				
Southgate----------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop---------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
UbD*---------- Urban land	Variable----------	Variable----------	Variable----------	Variable.
UcC*:				
Urban land----------	Variable----------	Variable----------	Variable----------	Variable.

See footnote at end of table.

Table 11.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
UcC*:				
Cinnamon Bay	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
UgC*:				
Urban land	Variable	Variable	Variable	Variable.
Glynn	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Us	Variable	Variable	Variable	Variable.
Ustorthents				
VsC*:				
Victory	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Southgate	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
VsD*:				
Victory	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Southgate	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
VsE*, VsF*:				
Victory	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Southgate	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Irrigation	Terraces and diversions	Grassed waterways
AcD*, AcE*, AcF*, AcG*:						
Annaberg	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Cramer	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Slope, depth to rock.	Slope, droughty, depth to rock.
AmD*, AmE*, AmF*, AmG*:						
Annaberg	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Maho Bay	Severe: depth to rock, slope.	Severe: piping.	Severe: no water.	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
AqA, Aquents	Slight	Severe: ponding, excess salt.	Severe: salty water.	Ponding, flooding.	Ponding	Wetness, excess salt.
ArB, Arawak	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
ArC, ArD, ArE, ArF, Arawak	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
BrB*, Beaches	Severe: depth to rock.	Slight	Severe: no water.	Depth to rock, flooding.	Depth to rock	Depth to rock.
BsB*, Beaches	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: salty water, cutbanks cave.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, excess salt, droughty.
BtB*, Beaches	Severe: seepage.	Severe: large stones, wetness.	Severe: large stones, cutbanks cave.	Large stones, wetness, droughty.	Large stones, wetness, too sandy.	Large stones, wetness, droughty.
CaA, Carib	Slight	Severe: wetness.	Severe: slow refill.	Wetness, flooding.	Wetness	Favorable.
CbB, Cinnamon Bay	Moderate: seepage.	Slight	Severe: no water.	Rooting depth, flooding.	Favorable	Rooting depth.
CgC, Cinnamon Bay	Severe: slope.	Slight	Severe: no water.	Slope, rooting depth, flooding.	Slope	Slope, rooting depth.

See footnote at end of table.

Table 12.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Irrigation	Terraces and diversions	Grassed waterways
CvC*:						
Cramer	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Depth to rock	Droughty, depth to rock.
Victory	Moderate: seepage, depth to rock, slope.	Moderate: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
CvD*, CvE*, CvF*:						
Cramer	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Slope, depth to rock.	Slope, droughty, depth to rock.
Victory	Severe: slope.	Moderate: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
DoE*, DoF*, DoG*:						
Dorothea	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
Susannaberg	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
FsD*, FsE*, FsF*, FsG*:						
Fredriksdal	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Susannaberg	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
GyA---------- Glynn	Moderate: seepage.	Slight----------	Severe: no water.	Droughty-------	Favorable------	Droughty.
GyB---------- Glynn	Moderate: seepage, slope.	Slight----------	Severe: no water.	Slope, droughty.	Favorable------	Droughty.
GyC---------- Glynn	Severe: slope.	Slight----------	Severe: no water.	Slope, droughty.	Slope----------	Slope, droughty.
HeA---------- Hesselberg	Severe: cemented pan.	Moderate: piping.	Severe: no water.	Droughty, slow intake.	Cemented pan, percs slowly.	Droughty, cemented pan.
HeB---------- Hesselberg	Severe: cemented pan.	Moderate: piping.	Severe: no water.	Slope, droughty, slow intake.	Cemented pan, percs slowly.	Droughty, cemented pan.
HeC---------- Hesselberg	Severe: cemented pan, slope.	Moderate: piping.	Severe: no water.	Slope, droughty, slow intake.	Slope, cemented pan, percs slowly.	Slope, droughty, cemented pan.
HgA---------- Hogensborg	Slight----------	Severe: hard to pack.	Severe: no water.	Percs slowly, excess salt.	Erodes easily, percs slowly.	Erodes easily, percs slowly.

See footnote at end of table.

Table 12.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Irrigation	Terraces and diversions	Grassed waterways
HgB---------- Hogensborg	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Slope, percs slowly, excess salt.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
HgC---------- Hogensborg	Severe: slope.	Severe: hard to pack.	Severe: no water.	Slope, percs slowly, excess salt.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
JaB---------- Jaucas	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Droughty, fast intake.	Too sandy, soil blowing.	Excess salt, droughty.
JsD*, JsE*, JsF*:						
Jealousy---------	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Southgate--------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
LmC---------- Lameshur	Severe: seepage.	Severe: seepage.	Severe: no water.	Slope, droughty.	Too sandy------	Droughty.
PaB---------- Parasol	Severe: seepage.	Moderate: piping.	Severe: no water.	Slope----------	Too sandy------	Favorable.
PaC---------- Parasol	Severe: seepage, slope.	Moderate: piping.	Severe: no water.	Slope----------	Slope, too sandy.	Slope.
Pt*---------- Pits	Severe: depth to rock, slope.	Slight---------	Severe: no water.	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
RdB---------- Redhook	Severe: seepage.	Severe: seepage.	Severe: no water.	Droughty, fast intake.	Too sandy------	Excess salt, droughty.
SaA*---------- Salt flats	Slight---------	Severe: hard to pack, ponding, excess salt.	Severe: slow refill, salty water.	Ponding, droughty.	Erodes easily, ponding, percs slowly.	Wetness, excess salt, erodes easily.
SBA*:						
Sandy Point------	Slight---------	Severe: piping, ponding, excess salt.	Severe: slow refill, salty water.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Wetness, excess salt, percs slowly.
Sugar Beach------	Slight---------	Severe: excess humus, ponding, excess salt.	Severe: slow refill, salty water.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Wetness, excess salt, percs slowly.
SiA---------- Sion	Slight---------	Moderate: piping.	Severe: no water.	Slow intake----	Favorable------	Favorable.
SiB---------- Sion	Moderate: slope.	Moderate: piping.	Severe: no water.	Slope, slow intake.	Favorable------	Favorable.

See footnote at end of table.

Table 12.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Irrigation	Terraces and diversions	Grassed waterways
SoA---------- Solitude	Slight---------	Severe: wetness, excess salt.	Severe: slow refill, salty water.	Wetness, droughty, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, excess salt, droughty.
SrD*, SrE*, SrF*, SrG*:						
Southgate-------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop----	Severe: depth to rock, slope.	Slight---------	Severe: no water.	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
UbD*---------- Urban land	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
UcC*:						
Urban land-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Cinnamon Bay-----	Moderate: seepage, slope.	Slight---------	Severe: no water.	Slope, rooting depth, flooding.	Favorable------	Rooting depth.
UgC*:						
Urban land-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
Glynn------------	Moderate: seepage, slope.	Slight---------	Severe: no water.	Slope, droughty.	Favorable------	Droughty.
Us---------- Ustorthents	Variable-------	Variable-------	Variable-------	Variable-------	Variable-------	Variable.
VsC*:						
Victory----------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
Southgate--------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
VsD*, VsE*, VsF*:						
Victory----------	Severe: slope.	Moderate: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Southgate--------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
AcD*, AcE*, AcF*, AcG*:												
Annaberg	0-5	Gravelly loam	GC, GM-GC, SC, CL	A-4, A-6, A-7-6	5-30	1-5	65-85	60-80	55-80	45-70	21-48	4-25
	5-10	Very gravelly loam, very gravelly clay loam, extremely gravelly clay loam.	GC, GM-GC	A-2-4, A-2-6, A-4, A-6	0	0-2	40-50	35-45	35-45	30-40	21-48	4-25
	10-13	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	13-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cramer	0-9	Gravelly clay loam.	CL, CH, GC, SC	A-7	5-30	1-5	65-85	60-80	50-60	45-55	39-66	18-39
	9-19	Clay, clay loam, gravelly clay.	CH, CL	A-7-6	0	0	80-100	80-100	75-95	70-80	48-66	25-39
	19-32	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	32-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
AmD*, AmE*, AmF*, AmG*:												
Annaberg	0-5	Gravelly loam	GC, GM-GC, SC, CL	A-4, A-6, A-7-6	5-30	1-5	65-85	60-80	55-80	45-70	21-48	4-25
	5-10	Very gravelly loam, very gravelly clay loam, extremely gravelly clay loam.	GC, GM-GC	A-2-4, A-2-6, A-4, A-6	0	0-2	40-50	35-45	35-45	30-40	21-48	4-25
	10-13	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	13-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Maho Bay	0-7	Gravelly loam	CL	A-6	5-15	5-15	90-100	90-100	80-90	70-90	30-40	10-20
	7-11	Gravelly loam, clay loam, loam.	CL, CL-ML	A-6, A-4	0-5	0-20	90-100	90-100	80-90	70-90	25-40	5-20
	11-22	Silty loam	ML, CL-ML	A-4	0	0-15	25-45	15-40	15-35	10-20	---	---
	22-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
AqA----------Aquents	0-60	Variable	---	---	0	0	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
ArB, ArC, ArD, ArE, ArF----- Arawak	0-6	Gravelly loam	GC, CL, SC	A-7-6, A-6, A-2-6	1-5	1-5	60-80	50-80	40-70	20-60	30-44	11-22
	6-11	Gravelly loam, very gravelly loam, very gravelly clay loam.	GC, CL, SC	A-6, A-2-6, A-2-7	0-2	0-5	50-80	40-80	30-70	15-60	25-44	11-22
	11-14	Very gravelly loam, very gravelly clay loam.	GC, CL, SC	A-6, A-2-6, A-2-7	0-2	0-5	30-80	30-80	20-80	15-80	25-44	11-22
	14-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
BrB*----------Beaches	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
BsB*----------Beaches	0-6	Sand----------	SP	A-1, A-3	0	0	100	75-100	5-85	0-5	---	NP
	6-60	Coarse sand, sand, fine sand.	SP	A-1, A-3	0	0	100	75-100	5-85	0-5	---	NP
BtB*----------Beaches	0-6	Extremely stony sand.	GP, SP	A-1	---	30-65	20-55	20-50	5-30	0-5	---	NP
	6-60	Extremely stony coarse sand, extremely cobbly sand, very cobbly sand.	---	A-1	---	50-75	20-65	20-60	5-30	0-5	---	NP
CaA----------Carib	0-8	Clay loam-----	CL	A-7-6, A-6	0	0-1	100	90-100	85-95	60-70	30-48	11-32
	8-32	Clay loam, sandy clay loam.	CL	A-7-6, A-6	0	0-1	100	90-100	85-95	60-70	30-48	11-32
	32-52	Clay loam, sandy clay loam, sandy loam.	CL	A-7-6, A-6	0	0-1	90-100	75-90	60-90	55-75	30-45	11-25
	52-60	Clay loam, sandy clay loam, sandy loam.	CL	A-7-6, A-6	0	0-1	80-100	75-90	55-80	45-75	30-45	11-25
CbB----------Cinnamon Bay	0-11	Loam----------	CL, CL-ML	A-7-6, A-6, A-4	0	0-1	90-100	90-95	75-85	55-65	21-48	4-25
	11-21	Loam, clay loam, gravelly clay loam.	CL, CL-ML, SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-95	75-90	60-80	45-60	21-48	4-25
	21-60	Sandy clay loam, sandy loam, gravelly sandy clay loam.	SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-100	75-95	55-75	25-50	21-48	4-25

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
CgC---------- Cinnamon Bay	0-11	Gravelly loam	CL, CL-ML, SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-90	80-85	65-75	45-55	21-48	4-25
	11-21	Loam, clay loam, gravelly clay loam.	CL, CL-ML, SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-95	75-90	60-80	45-60	21-48	4-25
	21-60	Sandy clay loam, sandy loam, gravelly sandy clay loam.	SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-100	75-95	55-75	25-50	21-48	4-25
CvC*, CvD*, CvE*, CvF*:												
Cramer------	0-9	Gravelly clay loam.	CL, CH	A-7, A-6	1-5	1-5	80-90	70-80	70-80	60-70	39-66	18-39
	9-19	Clay, clay loam, gravelly clay.	CH, CL	A-7-6	0	0	80-100	80-100	75-95	70-80	48-66	25-39
	19-32	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	32-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Victory-----	0-11	Loam----------	GC, GM-GC, SC, CL	A-4, A-6	1-5	1-5	65-95	60-90	55-80	45-75	25-35	7-15
	11-20	Loam, gravelly loam.	CL, GC, GM-GC, SC	A-4, A-6	0	0-1	65-95	60-90	55-80	45-75	25-35	7-15
	20-33	Gravelly loam, very gravelly loam, extremely gravelly loam.	GC, GM-GC	A-2-4, A-2-6	0	1-5	40-60	30-45	25-40	20-30	25-35	7-15
	33-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	50-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
DoE*, DoF*, DoG*:												
Dorothea----	0-6	Clay loam-----	CL, CH	A-7	5-15	5-10	100	100	90-100	70-80	46-54	25-31
	6-19	Clay, clay loam, gravelly clay loam.	CH	A-7	0	0	100	100	90-100	75-95	56-66	33-41
	19-30	Clay loam, gravelly clay loam, loam.	CL, ML, MH, CH	A-7	0	0	100	100	90-100	70-80	42-56	17-25
	30-60	Stony clay loam, gravelly loam, clay loam.	CL, CH	A-7	0-10	5-20	75-85	70-80	65-80	50-65	42-56	17-30

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
DoE*, DoF*, DoG*:												
Susannaberg-	0-2	Clay loam-----	CL, CH, GC, SC	A-7	5-30	1-5	65-85	60-80	50-60	45-55	46-66	25-41
	2-9	Clay, clay loam, gravelly clay.	CL, CH	A-7-6	0	0-1	80-90	70-80	60-70	50-60	40-56	20-33
	9-15	Very gravelly clay, very gravelly clay loam, gravelly clay loam.	GC, CL, CH	A-7-6	0	0-2	60-70	50-70	45-60	40-55	40-56	20-33
	15-21	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	21-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
FsD*, FsE*, FsF*, FsG*:												
Fredriksdal-	0-7	Very gravelly clay loam.	GC, CH, SC	A-7	5-30	1-5	65-85	60-70	50-60	45-55	46-66	25-41
	7-12	Very gravelly clay loam, very gravelly clay.	CH, GC	A-7-6	0	0-2	60-70	50-70	45-60	40-55	40-56	20-33
	12-16	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	16-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Susannaberg-	0-2	Clay loam-----	CL, CH, GC, SC	A-7	5-30	1-5	65-85	60-80	50-60	45-55	46-66	25-41
	2-9	Clay, clay loam, gravelly clay.	CL, CH	A-7-6	0	0-1	80-90	70-80	60-70	50-60	40-56	20-33
	9-15	Very gravelly clay, very gravelly clay loam, gravelly clay loam.	GC, CL, CH	A-7-6	0	0-2	60-70	50-70	45-60	40-55	40-56	20-33
	15-21	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	21-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
GyA, GyB, GyC-Glynn	0-4	Gravelly loam	CL, SC	A-7-6, A-6	0	0-1	75-95	65-95	50-75	40-60	30-48	11-25
	4-17	Gravelly loam, gravelly clay loam, very gravelly clay.	CL, SC	A-7-6, A-6	0	0-1	75-85	60-85	45-75	40-60	30-48	11-25
	17-27	Very gravelly loam, very gravelly clay loam, very gravelly clay.	CL, CH, GC, SC	A-7-6, A-6, A-2-6	0	0-1	65-95	45-95	30-80	20-65	30-53	11-29
	27-32	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly clay.	CL, SC	A-7-6, A-6	0	0-1	65-85	60-90	50-80	40-75	30-48	11-25
	32-41	Very gravelly clay loam, very gravelly clay.	CL, GC, SC	A-7-6, A-6	0	0-1	70-85	60-85	45-65	40-60	30-48	11-25
	41-60	Very gravelly clay loam, very gravelly clay, very gravelly sandy clay loam.	GC, SC	A-7-6, A-6, A-2-6	0	0-1	65-85	55-65	40-60	25-50	30-48	11-25
HeA, HeB, HeC-Hesselberg	0-12	Clay----------	CH, CL	A-7-6	0	0	90-100	90-100	85-95	70-95	48-75	25-46
	12-17	Clay, gravelly clay.	CH, CL, GC, SC	A-7-6	0-1	0-2	50-90	50-90	40-85	40-85	48-75	25-46
	17-24	Cemented------	---	---	---	---	---	---	---	---	---	---
	24-60	Gravelly sandy loam, loam, gravelly loam.	CL	A-4, A-6	0-1	0-1	90-100	90-100	80-90	60-70	26-34	8-14
HgA, HgB, HgC-Hogensborg	0-13	Clay loam-----	CH, CL	A-7	0	0	95-100	95-100	90-95	75-85	46-76	25-49
	13-31	Clay loam, clay.	CH, CL	A-7	0	0	95-100	95-100	95-100	85-90	46-76	25-49
	31-62	Clay loam, clay.	CH, CL	A-7	0	0	90-95	85-90	80-90	65-75	46-76	25-49
	62-88	Clay loam, clay, gravelly clay loam.	CH, GC, SC, CL	A-7, A-6	0	0-1	70-95	65-90	55-90	40-75	36-76	17-49

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
JaB---------- Jaucas	0-6 6-60	Sand---------- Sand----------	SP-SM, SM SP-SM, SM	A-2, A-3 A-2, A-3	0 0	0 0	100 100	100 100	50-70 50-70	5-15 5-15	--- ---	NP NP
JsD*, JsE*, JsF*: Jealousy----	0-9	Gravelly clay loam.	SC, CL	A-2-7	0	0-1	75-85	75-85	70-80	15-20	40-50	20-28
	9-15	Clay loam, gravelly clay loam, gravelly clay.	CL	A-7-6	0	0-1	75-100	75-100	70-95	55-65	40-50	20-28
	15-26	Clay loam, gravelly clay loam, gravelly clay.	CL	A-7-6	0	0-1	75-100	75-100	70-95	55-65	40-50	20-28
	26-38	Clay loam, gravelly clay loam, gravelly sandy clay loam.	CL	A-6	0	0-1	75-100	75-100	70-95	55-65	30-39	11-18
	38-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
Southgate--- 	0-5 5-10	Gravelly loam Very gravelly loam, very gravelly clay loam.	GC, GM-GC, SC, CL GC, GM-GC	A-4, A-6 A-2-4, A-2-6	1-5 0	1-5 0-2	65-85 40-45	60-80 30-35	55-80 25-35	40-75 20-25	25-35 25-35	7-15 7-15
	10-17	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	17-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
LmC---------- Lameshur	0-6	Gravelly sandy loam.	GM, GC, GM-GC	A-1-b, A-2-4, A-2-6	5-30	5-10	50-55	40-45	25-40	20-35	10-25	NP-15
	6-18	Extremely gravelly sandy loam, extremely gravelly loamy sand, very gravelly loamy sand.	GM, GC, GM-GC	A-4, A-2-4, A-2-6, A-6	0-5	1-5	50-65	40-50	30-40	25-40	10-25	NP-15
	18-35	Extremely stony sandy clay loam, very stony loamy sand, extremely stony sandy loam, extremely stony sandy clay loam.	GM, GC, GP-GM, GM-GC	A-1, A-2-4	5-30	5-10	30-55	25-40	15-35	10-30	10-25	NP-10
	35-60	Extremely stony loamy sand, very stony sandy loam, extremely stony loam, extremely stony sandy clay loam.	GM, GC, GP-GM, GM-GC	A-1, A-2-4	5-30	5-15	30-55	25-40	15-35	10-30	10-25	NP-10
PaB, PaC------ Parasol	0-13	Clay loam-----	CL	A-7-6	0	0	100	100	90-100	70-80	40-50	20-28
	13-24	Clay loam, clay.	CH	A-7-6	0	0	100	100	85-95	75-95	50-60	28-36
	24-40	Clay loam, sandy clay loam, sandy loam.	CL	A-7-6	0	0	100	100	85-95	70-80	40-46	20-25
	40-80	Sandy loam, loamy sand, sandy clay loam.	SC, CL	A-6	0	0	100	100	35-60	35-60	30-39	11-18
Pt*---------- Pits	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
RdB---------- Redhook	0-7	Extremely stony sand.	GP-GM, SP-SM	A-1-a, A-1-b	3-25	1-5	20-55	10-50	5-35	5-10	---	NP
	7-10	Very stony sand, very cobbly sand, extremely gravelly sand.	GP-GM, SP-SM	A-1-a, A-1-b	1-10	1-5	20-55	10-50	5-35	5-10	---	NP
	10-60	Very gravelly sand, gravelly sand, very cobbly sand.	GP-GM, SP-SM	A-1-a, A-1-b	0-2	1-5	25-55	10-50	5-35	5-10	---	NP
SaA*---------- Salt flats	0-6	Silty clay loam.	CL, CH, MH	A-7	0	0	100	100	100	90-100	45-75	20-40
	6-60	Stratified clay to silt loam.	CL, ML, MH	A-7	0	0	100	100	100	90-100	40-65	15-30
SBA*:												
Sandy Point--	0-6	Sandy clay loam.	CL, CL-ML	A-7, A-4, A-6	0	0	100	100	90-100	75-95	21-48	4-25
	6-33	Clay loam, loam, sandy clay loam, gravelly sandy clay loam.	CL, CL-ML	A-7, A-4, A-6	0	0	90-100	90-100	80-100	75-95	21-48	4-25
	33-45	Muck----------	PT	A-8	0	0	---	---	---	---	---	NP
	45-60	Mucky clay loam, mucky loam.	OL, CL, CL-ML	A-4, A-6	0	0	90-100	90-100	90-100	90-100	21-35	4-15
Sugar Beach--	0-4	Muck----------	PT	A-8	0	0	---	---	---	---	---	NP
	4-8	Mucky clay loam.	OL, CL, CL-ML	A-4, A-6	0	0	90-100	90-100	80-100	75-95	21-35	4-15
	8-60	Muck----------	PT	A-8	0	0	---	---	---	---	---	NP
SiA, SiB------ Sion	0-12	Clay----------	CH	A-7-6	0	0-1	90-95	85-90	75-85	60-70	55-57	30-32
	12-16	Clay loam, clay, gravelly clay.	CH	A-7-6	0	0-1	90-95	85-90	75-90	60-70	53-57	29-32
	16-32	Gravelly sandy clay loam, gravelly sandy loam, gravelly loam.	CL, SC, GC	A-7-6, A-2-7	0	0-1	55-95	40-90	35-90	25-90	43-46	21-23
	32-60	Loam, silt loam, gravelly sandy loam.	CL	A-4, A-6	0	0-1	90-100	90-100	80-90	60-70	26-34	8-14

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
SoA---------- Solitude	0-6	Gravelly fine sandy loam.	SC, GC, GM-GC, SC-SM	A-6, A-2-4, A-2-6, A-4	0	0	70-85	60-75	50-70	30-50	21-35	4-15
	6-28	Gravelly fine sandy loam, gravelly loam.	SC, SC-SM	A-6, A-2-4, A-2-6, A-4	0	0	70-90	65-85	50-70	30-40	21-30	4-11
	28-61	Gravelly fine sandy loam, gravelly loam.	SC, GC, GP-GC, SP-SC	A-6, A-2-4, A-2-6, A-4	0	0	40-90	15-75	15-65	5-50	25-35	7-15
SrD*, SrE*, SrF*, SrG*: Southgate---	0-5	Very gravelly loam.	GC, GM-GC, SC, CL	A-4, A-6, A-7-6	5-30	1-5	65-85	60-80	55-80	40-75	25-35	7-15
	5-10	Very gravelly loam, very gravelly clay loam.	GC, GM-GC	A-2-4, A-2-6	0	0-2	40-45	30-35	25-35	20-25	25-35	7-15
	10-17	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	17-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
UbD*---------- Urban land	0-60	Variable------	---	---	---	---	---	---	---	---	---	---
UcC*: Urban land---	0-60	Variable------	---	---	---	---	---	---	---	---	---	---
Cinnamon Bay-	0-11	Loam----------	CL, CL-ML	A-7-6, A-6, A-4	0	0-1	90-100	90-95	75-85	55-65	21-48	4-25
	11-21	Loam, clay loam, gravelly clay loam.	CL, CL-ML, SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-95	75-90	60-80	45-60	21-48	4-25
	21-60	Sandy clay loam, sandy loam, gravelly sandy clay loam.	SC, SC-SM	A-7-6, A-6, A-4	0	0-1	80-100	75-95	55-75	25-50	21-48	4-25
UgC*: Urban land---	0-60	Variable------	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
UgC*:												
Glynn--------	0-4	Gravelly loam	CL, SC	A-7-6, A-6	0	0-1	75-95	65-95	50-75	40-60	30-48	11-25
	4-17	Gravelly loam, gravelly clay loam, very gravelly clay.	CL, SC	A-7-6, A-6	0	0-1	75-85	60-85	45-75	40-60	30-48	11-25
	17-27	Very gravelly loam, very gravelly clay loam, very gravelly clay.	CL, CH, GC, SC	A-7-6, A-6, A-2-6	0	0-1	65-95	45-95	30-90	20-65	30-53	11-29
	27-32	Very gravelly clay loam, very gravelly sandy clay loam, very gravelly clay.	CL, SC	A-7-6, A-6	0	0-1	65-85	60-90	50-80	40-75	30-48	11-25
	32-41	Very gravelly clay loam, very gravelly clay.	CL, GC, SC	A-7-6, A-6	0	0-1	70-85	60-85	45-65	40-60	30-48	11-25
	41-60	Very gravelly clay loam, very gravelly clay, very gravelly sandy clay loam.	GC, SC	A-7-6, A-6, A-2-6	0	0-1	65-85	55-65	40-60	25-50	30-48	11-25
Us---------- Ustorthents	0-60	Variable------	---	---	---	---	---	---	---	---	---	---
VsC*, VsD*, VsE*, VsF*:												
Victory-----	0-11	Loam----------	GC, GM-GC, SC, CL	A-4, A-6	1-5	1-5	65-95	60-90	55-80	45-75	25-35	7-15
	11-20	Loam, gravelly loam.	CL, GC, GM-GC, SC	A-4, A-6	0	0-1	65-95	60-90	55-80	45-75	25-35	7-15
	20-33	Gravelly loam, very gravelly loam, extremely gravelly loam.	GC, GM-GC	A-2-4, A-2-6	0	1-5	40-60	30-45	25-40	20-30	25-35	7-15
	33-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	50-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 13.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
VsC*, VsD*, VsE*, VsF*:												
Southgate---	0-5	Gravelly loam	GC, GM-GC, SC, CL	A-4, A-6	1-5	1-5	65-85	60-80	55-80	40-75	25-35	7-15
	5-10	Very gravelly loam, very gravelly clay loam.	GC, GM-GC	A-2-4, A-2-6	0	0-2	40-45	30-35	25-35	20-25	25-35	7-15
	10-17	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
	17-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.--Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm		K	T		Pct
AcD*, AcE*, AcF*, AcG*:												
Annaberg	0-5	10-35	1.30-1.50	2.0-6.0	0.04-0.15	5.1-7.3	0-2	Moderate	0.05	1	8	4-6
	5-10	10-35	1.30-1.60	0.6-2.0	0.05-0.15	4.5-6.5	0-2	Moderate	0.05			
	10-13	---	---	0.00-0.2	0.0-0.01	---	---	----------	----			
	13-60	---	---	0.00-0.06	0.0-0.01	---	---	----------	----			
Cramer	0-9	30-40	1.15-1.20	0.6-2.0	0.09-0.15	6.1-7.3	0-2	High------	0.05	2	8	4-10
	9-19	40-60	1.30-1.40	0.6-2.0	0.10-0.18	5.6-6.5	0-2	High------	0.10			
	19-32	---	---	0.00-0.2	0.0-0.02	---	---	----------	----			
	32-60	---	---	0.00-0.06	0.0-0.01	---	---	----------	----			
AmD*, AmE*, AmF*, AmG*:												
Annaberg	0-5	10-35	1.30-1.50	2.0-6.0	0.04-0.15	5.1-7.3	0-2	Moderate	0.05	1	8	4-6
	5-10	10-35	1.30-1.60	0.6-2.0	0.05-0.15	4.5-6.5	0-2	Moderate	0.05			
	10-13	---	---	0.00-0.2	0.0-0.01	---	---	----------	----			
	13-60	---	---	0.00-0.06	0.0-0.01	---	---	----------	----			
Maho Bay	0-7	20-30	1.40-1.70	0.6-2.0	0.04-0.07	5.1-7.3	0-2	Moderate	0.17	2	8	4-11
	7-11	15-30	1.50-1.80	0.6-2.0	0.05-0.21	4.5-6.5	0-2	Moderate	0.15			
	11-22	---	---	0.00-0.2	0.0-0.02	---	---	----------	----			
	22-60	---	---	0.00-0.06	0.0-0.01	---	---	----------	----			
AqA	0-60	10-60	---	---	---	---	16-32	----------	----	5	---	0-6
Aquents												
ArB, ArC, ArD, ArE, ArF	0-6	20-35	1.30-1.40	2.0-6.0	0.05-0.14	7.9-8.4	0-2	Moderate	0.05	2	4L	2-5
Arawak	6-11	20-35	1.20-1.30	0.6-2.0	0.05-0.14	7.9-8.4	0-2	Moderate	0.05			
	11-14	20-35	1.20-1.30	0.6-2.0	0.05-0.14	7.9-8.4	0-2	Low-------	0.05			
	14-60	---	---	0.00-0.6	0.0-0.01	---	---	----------	----			
BrB*	0-60	---	---	---	---	---	0-2	----------	----	---	8	---
Beaches												
BsB*	0-6	0-1	1.35-1.85	>6.0	0.03-0.05	5.1-7.8	4-16	Low-------	0.05	5	1	<.1
Beaches	6-60	0-1	1.35-1.85	>6.0	0.03-0.05	5.1-7.8	4-16	Low-------	0.05			
BtB*	0-6	0-1	---	>6.0	0.01-0.03	---	4-16	Low-------	0.02	5	8	<.1
Beaches	6-60	0-1	---	>6.0	0.01-0.03	---	4-16	Low-------	0.02			
CaA	0-8	25-40	1.00-1.60	0.2-0.6	0.12-0.17	6.6-7.8	0-2	Moderate	0.32	5	4	4-6
Carib	8-32	25-40	1.00-1.60	0.2-0.6	0.12-0.17	6.6-7.8	0-2	Moderate	0.32			
	32-52	18-40	1.00-1.60	0.2-0.6	0.12-0.21	6.6-7.8	2-4	Moderate	0.32			
	52-60	18-40	1.00-1.60	0.2-0.6	0.13-0.21	6.6-7.8	2-4	Moderate	0.32			
CbB	0-11	10-40	1.35-1.65	0.6-2.0	0.14-0.21	5.6-6.5	0-2	Low-------	0.17	5	6	2-4
Cinnamon Bay	11-21	10-40	1.35-1.65	0.6-2.0	0.12-0.25	6.6-7.8	0-2	Low-------	0.24			
	21-60	10-35	1.35-1.80	0.6-2.0	0.10-0.18	7.4-7.8	0-2	Low-------	0.20			
CgC	0-11	10-40	1.35-1.65	0.6-2.0	0.10-0.18	5.6-6.5	0-2	Low-------	0.15	5	6	2-4
Cinnamon Bay	11-21	10-40	1.35-1.65	0.6-2.0	0.12-0.25	6.6-7.8	0-2	Low-------	0.24			
	21-60	10-35	1.35-1.80	0.6-2.0	0.10-0.18	7.4-7.8	0-2	Low-------	0.20			

See footnote at end of table.

Table 14.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
CvC*, CvD*, CvE*, CvF*:												
Cramer	0-9	30-60	1.15-1.20	0.6-2.0	0.09-0.18	6.1-7.3	0-2	High	0.05	2	4	4-10
	9-19	40-60	1.30-1.40	0.6-2.0	0.10-0.18	5.6-6.5	0-2	High	0.10			
	19-32	---	---	0.00-0.2	0.0-0.02	---	---	---	---			
	32-60	---	---	0.00-0.06	0.0-0.01	---	---	---	---			
Victory	0-11	12-25	1.40-1.70	2.0-6.0	0.05-0.15	6.1-7.3	0-2	Low	0.20	3	6	1-5
	11-20	12-25	1.45-1.75	0.6-2.0	0.10-0.18	6.1-7.3	0-2	Low	0.20			
	20-33	12-25	1.45-1.75	0.6-2.0	0.04-0.15	6.1-7.3	0-2	Low	0.10			
	33-50	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	50-60	---	---	0.00-0.06	0.0-0.0	---	---	---	---			
DoE*, DoF*, DoG*:												
Dorothea	0-6	30-38	1.20-1.30	0.6-2.0	0.15-0.20	6.1-7.3	0-2	Moderate	0.15	5	4	2-5
	6-19	35-50	1.15-1.30	0.06-0.2	0.12-0.18	6.1-7.3	0-2	High	0.15			
	19-30	25-40	1.25-1.40	0.06-0.2	0.13-0.18	6.1-7.3	0-2	Moderate	0.15			
	30-60	25-40	1.45-1.65	0.06-0.2	0.11-0.14	6.1-7.3	0-2	Moderate	0.15			
Susannaberg	0-2	30-45	1.30-1.50	0.6-2.0	0.11-0.17	6.1-7.3	0-2	Moderate	0.10	2	4	4-7
	2-9	30-45	1.30-1.60	0.06-0.2	0.12-0.22	6.1-7.3	0-2	High	0.15			
	9-15	35-55	1.30-1.60	0.06-0.2	0.11-0.17	6.1-7.3	0-2	High	0.10			
	15-21	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	21-60	---	---	0.00-0.06	0.0-0.01	---	---	---	---			
FsD*, FsE*, FsF*, FsG*:												
Fredriksdal	0-7	30-50	1.30-1.50	0.6-2.0	0.12-0.22	6.1-7.3	0-2	High	0.10	1	8	4-7
	7-12	35-55	1.30-1.60	0.06-0.2	0.11-0.17	6.1-7.3	0-2	High	0.10			
	12-16	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	16-60	---	---	0.00-0.06	0.0-0.01	---	---	---	---			
Susannaberg	0-2	30-45	1.30-1.50	0.6-2.0	0.11-0.17	6.1-7.3	0-2	Moderate	0.10	2	4	4-7
	2-9	30-45	1.30-1.60	0.06-0.2	0.12-0.22	6.1-7.3	0-2	High	0.15			
	9-15	35-55	1.30-1.60	0.06-0.2	0.11-0.17	6.1-7.3	0-2	High	0.10			
	15-21	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	21-60	---	---	0.00-0.06	0.0-0.01	---	---	---	---			
GyA, GyB, GyC	0-4	20-40	1.35-1.45	0.6-2.0	0.05-0.12	6.6-7.3	0-2	Moderate	0.17	5	6	1-6
Glynn	4-17	25-40	1.35-1.45	0.6-2.0	0.09-0.15	6.6-7.8	0-2	Moderate	0.10			
	17-27	30-45	1.35-1.45	0.2-0.6	0.05-0.12	7.4-8.4	0-2	Moderate	0.10			
	27-32	30-40	1.35-1.60	0.2-0.6	0.05-0.14	7.4-9.0	2-4	Moderate	0.05			
	32-41	30-40	1.35-1.60	0.2-0.6	0.05-0.14	7.4-9.0	2-4	Moderate	0.05			
	41-60	30-40	1.35-1.60	0.6-2.0	0.05-0.14	7.4-9.0	2-4	Moderate	0.10			
HeA, HeB, HeC	0-12	40-70	1.00-1.10	0.2-6.0	0.12-0.18	7.4-8.4	0-2	High	0.05	2	4	2-6
Hesselberg	12-17	40-70	1.00-1.10	0.2-0.6	0.10-0.18	7.4-8.4	0-2	High	0.15			
	17-24	---	---	0.00-0.06	0.0-0.0	---	---	---	---			
	24-60	16-25	1.20-1.30	0.05-0.2	0.05-0.10	7.9-9.0	0-2	Low	0.24			
HgA, HgB, HgC	0-13	30-60	1.20-1.25	<0.06	0.12-0.21	6.1-7.8	0-2	Very high	0.28	5	4	2-8
Hogensborg	13-31	30-60	1.20-1.25	<0.06	0.12-0.21	7.4-8.4	0-8	Very high	0.37			
	31-62	30-60	1.20-1.25	<0.06	0.12-0.21	7.4-8.4	0-8	Very high	0.28			
	62-88	30-60	1.20-1.40	<0.06	0.09-0.18	7.4-8.4	0-8	Very high	0.28			
JaB	0-6	0-2	1.55-1.60	20-40	0.03-0.05	7.9-8.4	8-16	Low	0.10	5	1	.5-1
Jaucas	6-60	0-2	1.55-1.60	20-40	0.03-0.05	7.9-8.4	8-16	Low	0.10			

See footnote at end of table.

Table 14.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm		K	T		Pct
JsD*, JsE*, JsF*:												
Jealousy	0-9	30-40	1.35-1.55	2.0-6.0	0.09-0.18	5.6-7.3	0-2	High	0.10	3	4	2-5
	9-15	30-50	1.35-1.55	2.0-6.0	0.12-0.21	6.6-7.8	0-2	High	0.10			
	15-26	30-50	1.35-1.55	0.6-2.0	0.12-0.21	6.6-7.8	0-2	High	0.05			
	26-38	20-40	1.35-1.55	0.6-2.0	0.09-0.18	6.6-7.8	0-2	Low	0.05			
	38-60	---	---	0.01-0.06	0.0-0.01	---	---	---	---			
Southgate	0-5	12-25	1.40-1.70	2.0-6.0	0.04-0.15	5.1-7.3	0-2	Low	0.15	1	8	1-4
	5-10	12-25	1.45-1.70	0.6-2.0	0.05-0.15	4.5-6.5	0-2	Low	0.05			
	10-17	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	17-60	---	---	0.00-0.06	0.0-0.0	---	---	---	---			
LmC	0-6	5-20	1.25-1.50	2.0-6.0	0.05-0.10	5.6-7.3	0-2	Low	0.02	5	8	2-4
Lameshur	6-18	5-20	1.25-1.55	2.0-6.0	0.06-0.10	6.1-7.3	0-2	Low	0.05			
	18-35	5-25	1.25-1.55	2.0-6.0	0.06-0.10	6.1-7.3	0-2	Low	0.02			
	35-60	5-20	1.25-1.55	2.0-6.0	0.06-0.10	6.1-7.3	0-2	Low	0.02			
PaB, PaC	0-13	25-35	1.40-1.50	2.0-6.0	0.12-0.18	5.1-7.3	0-2	Moderate	0.15	5	6	2-5
Parasol	13-24	35-50	1.35-1.45	0.6-2.0	0.12-0.18	6.1-7.3	0-2	Moderate	0.17			
	24-40	25-35	1.45-1.55	0.6-2.0	0.12-0.18	6.6-7.3	0-2	Moderate	0.20			
	62-80	4-20	1.45-1.60	2.0-20	0.05-0.13	6.6-7.8	0-2	Low	0.15			
Pt*	0-60	---	---	---	---	---	0-2	---	---	---	8	---
Pits												
RdB	0-7	0-5	1.50-1.60	20-40	0.02-0.06	7.9-8.4	8-16	Low	0.02	5	8	.5-1
Redhook	7-10	0-5	1.40-1.60	20-40	0.03-0.07	7.9-8.4	8-16	Low	0.02			
	10-60	0-5	1.40-1.60	20-40	0.03-0.08	7.9-8.4	8-16	Low	0.05			
SaA*	0-6	35-70	---	<0.06	0.02-0.04	>6.5	>16	High	0.37	5	5	<.1
Salt flats	6-60	35-60	---	<0.06	0.02-0.04	>6.5	>16	Moderate	0.37			
SBA*:												
Sandy Point	0-6	10-40	1.15-1.60	0.06-0.2	0.18-0.22	6.1-7.3	16-32	Moderate	0.20	5	8	3-6
	6-33	10-40	1.15-1.60	0.06-0.2	0.18-0.22	6.1-7.3	16-32	Moderate	0.20			
	33-45	---	0.06-0.20	0.06-0.2	0.20-0.25	6.1-7.3	16-32	Low	---			
	45-60	10-40	1.15-1.60	0.06-0.2	0.18-0.22	6.1-7.3	16-32	Low	0.20			
Sugar Beach	0-4	---	0.06-0.20	0.06-0.2	0.15-0.20	6.1-7.3	16-32	Low	---	3	8	60-80
	4-8	10-40	1.15-1.60	0.06-0.2	0.18-0.22	6.1-7.3	16-32	Low	0.20			
	8-60	---	0.06-0.20	0.06-0.2	0.15-0.20	6.1-7.3	16-32	Low	---			
SiA, SiB	0-12	40-51	1.15-1.25	2.0-6.0	0.14-0.20	7.4-8.4	0-2	Moderate	0.05	3	4	2-6
Sion	12-16	47-51	1.10-1.15	0.6-2.0	0.10-0.20	7.9-8.4	0-2	Moderate	0.05			
	16-32	20-35	1.20-1.30	0.2-0.6	0.08-0.20	7.9-8.4	0-2	Moderate	0.20			
	32-60	16-25	1.20-1.30	0.2-0.6	0.10-0.19	7.9-8.4	0-2	Low	0.28			
SoA	0-6	10-25	1.15-1.55	0.6-2.0	0.08-0.15	6.1-7.3	4-24	Low	0.17	5	3	2-4
Solitude	6-28	10-20	1.20-1.75	0.06-0.2	0.04-0.15	6.1-7.3	8-24	Low	0.15			
	28-61	15-25	1.45-1.75	0.06-0.2	0.04-0.15	6.1-7.3	8-24	Low	0.15			
SrD*, SrE*, SrF*, SrG*:												
Southgate	0-5	12-35	1.40-1.70	2.0-6.0	0.04-0.15	5.1-7.3	0-2	Low	0.10	1	8	1-4
	5-10	12-25	1.45-1.70	0.6-2.0	0.05-0.15	4.5-6.5	0-2	Low	0.05			
	10-17	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	17-60	---	---	0.00-0.06	0.0-0.0	---	---	---	---			
Rock outcrop	0-60	---	---	---	---	---	0-2	---	---	---	8	---

See footnote at end of table.

Table 14.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
UbD* Urban land	0-60	---	---	---	---	---	0-2	---	---	---	---	---
UcC*: Urban land	0-60	---	---	---	---	---	0-2	---	---	---	---	---
Cinnamon Bay	0-11	10-40	1.35-1.65	0.6-2.0	0.14-0.21	5.6-6.5	0-2	Low	0.17	5	6	2-4
	11-21	10-40	1.35-1.65	0.6-2.0	0.12-0.25	6.6-7.8	0-2	Low	0.24			
	21-60	10-35	1.35-1.80	0.6-2.0	0.10-0.18	7.4-7.8	0-2	Low	0.20			
UgC*: Urban land	0-60	---	---	---	---	---	0-2	---	---	---	---	---
Glynn	0-4	20-40	1.35-1.45	0.6-2.0	0.05-0.12	6.6-7.3	0-2	Moderate	0.17	5	6	1-6
	4-17	25-40	1.35-1.45	0.6-2.0	0.09-0.15	6.6-7.8	0-2	Moderate	0.10			
	17-27	30-45	1.35-1.45	0.2-0.6	0.05-0.12	7.4-8.4	0-2	Moderate	0.10			
	27-32	30-40	1.35-1.60	0.2-0.6	0.05-0.14	7.4-9.0	2-4	Moderate	0.05			
	32-41	30-40	1.35-1.60	0.2-0.6	0.05-0.14	7.4-9.0	2-4	Moderate	0.05			
	41-60	30-40	1.35-1.60	0.6-2.0	0.05-0.14	7.4-9.0	2-4	Moderate	0.10			
Us Ustorthents	0-60	---	---	---	---	---	---	---	---	---	---	---
VsC*, VsD*, VsE*, VsF*: Victory	0-11	12-25	1.40-1.70	2.0-6.0	0.05-0.15	6.1-7.3	0-2	Low	0.20	3	6	1-5
	11-20	12-25	1.45-1.75	0.6-2.0	0.10-0.18	6.1-7.3	0-2	Low	0.20			
	20-33	12-25	1.45-1.75	0.6-2.0	0.04-0.15	6.1-7.3	0-2	Low	0.10			
	33-50	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	50-60	---	---	0.00-0.06	0.0-0.0	---	---	---	---			
Southgate	0-5	12-25	1.40-1.70	2.0-6.0	0.04-0.15	5.1-7.3	0-2	Low	0.15	1	8	1-4
	5-10	12-25	1.45-1.70	0.6-2.0	0.05-0.15	4.5-6.5	0-2	Low	0.05			
	10-17	---	---	0.00-0.2	0.0-0.01	---	---	---	---			
	17-60	---	---	0.00-0.06	0.0-0.0	---	---	---	---			

*** See description of the map unit for composition and behavior characteristics of the map unit.**

Table 15.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
AcD*, AcE*, AcF*, AcG*:													
Annaberg	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Cramer	C	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
AmD*, AmE*, AmF*, AmG*:													
Annaberg	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Maho Bay	D	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
AqA. Aquents	D	Frequent	Very long	Jan-Dec	+1.-1.0	Apparent	Jan-Dec	>60	---	---	---	---	---
ArB, ArC, ArD, ArE, ArF. Arawak	B	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Low.
BrB*. Beaches	D	Frequent	Very brief to long.	Jan-Dec	>6.0	---	---	0	Hard	---	---	---	---
BsB*. Beaches	D	Frequent	Very brief to long.	Jan-Dec	0-6.0	Apparent	Jan-Dec	>60	---	---	---	High	High.
BtB*. Beaches	D	Frequent	Very brief to long.	Jan-Dec	0-6.0	Apparent	Jan-Dec	>60	---	---	---	---	---
CaA. Carib	D	Frequent	Brief	Apr-Dec	1.5-3.0	Apparent	Apr-Dec	>60	---	---	---	High	Low.
CbB, CgC. Cinnamon Bay	B	Occasional	Very brief	Apr-Dec	>6.0	---	---	>60	---	---	---	Moderate	Low.
CvC*, CvD*, CvE*, CvF*:													
Cramer	C	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
Victory	B	None	---	---	>6.0	---	---	20-40	Soft	---	---	Low	Low.

See footnote at end of table.

Table 15.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
DoE*, DoF*, DoG*:													
Dorothea	C	None	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Susannaberg	D	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
FsD*, FsE*, FsF*, FsG*:													
Fredriksdal	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Susannaberg	D	None	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
GyA, GyB, GyC----- Glynn	C	Rare	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
HeA, HeB, HeC----- Hesselberg	D	None	---	---	>6.0	---	---	>60	---	15-20	Thin	Moderate	Low.
HgA, HgB, HgC----- Hogensborg	D	Rare	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
JaB Jaucas	A	Rare	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
JsD*, JsE*, JsF*:													
Jealousy	C	None	---	---	>6.0	---	---	24-40	Soft	---	---	High-----	Low.
Southgate	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
LmC Lameshur	A	Occasional	Brief-----	Apr-Dec	>6.0	---	---	>60	---	---	---	Moderate	Low.
PaB, PaC Parasol	B	None	---	---	>6.0	---	---	>60	---	---	---	Low------	Low.
Pt* Pits	---	None	---	---	>6.0	---	---	0	Hard	---	---	---	---
RdB Redhook	A	Rare	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
SaA* Salt flats	D	Frequent----	Very long	Jan-Dec	+1-1.0	Apparent	Feb-Sep	>60	---	---	---	High-----	High.

See footnote at end of table.

Table 15.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
SBA*:													
Sandy Point	D	Frequent	Very long	Apr-Dec	+1-0.5	Apparent	Apr-Dec	>60	---	---	---	High	Moderate.
Sugar Beach	D	Frequent	Very long	Apr-Dec	+1-0.5	Apparent	Apr-Dec	>60	---	---	---	High	Moderate.
SiA, SiB---------- Sion	B	Rare	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
SoA---------- Solitude	D	Frequent	Brief	Apr-Dec	1.0-2.5	Apparent	Apr-Dec	>60	---	---	---	High	Low.
SrD*, SrE*, SrF*, SrG*:													
Southgate	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Rock outcrop	D	None	---	---	>6.0	---	---	0	Hard	---	---	---	---
UbD*---------- Urban land	---	None	---	---	>2.0	---	---	>10	---	---	---	---	---
UcC*:													
Urban land	---	Occasional	Very brief	Apr-Dec	>2.0	---	---	>10	---	---	---	---	---
Cinnamon Bay	B	Occasional	Very brief	Apr-Dec	>6.0	---	---	>60	---	---	---	Moderate	Low.
UgC*:													
Urban land	---	Rare	---	---	>2.0	---	---	>10	---	---	---	---	---
Glynn	C	Rare	---	---	>6.0	---	---	>60	---	---	---	High	Low.
Us---------- Ustorthents	---	Variable	---	---	---	---	---	---	---	---	---	---	---
VsC*, VsD*, VsE*, VsF*:													
Victory	B	None	---	---	>6.0	---	---	20-40	Soft	---	---	Low	Low.
Southgate	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Physical Analyses of Selected Soils

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In				
Arawak:[1,6]					
(S92VI-010-8)	0-6	A1	46.8	29.6	23.6
	6-11	A2	44.9	31.3	23.8
	11-14	C	47.6	28.9	23.5
	14-23	Cr1	---	---	---
	23-30	Cr2	43.3	35.6	21.1
	30-60	Cr3	---	---	---
Cinnamon Bay:[1,6]					
(S91VI-020-2)	0-3	A1	45.9	32.8	21.3
	3-11	A2	37.9	36.0	26.1
	11-21	Bw	39.6	31.7	28.7
	21-31	C1	60.8	21.2	18.0
	31-47	C2	52.5	24.0	23.5
	47-57	C3	55.7	22.5	21.8
	57-60	C4	56.8	22.5	20.7
Cramer:[1,6]					
(S64VI-10-6)	0-9	A	28.3	34.5	37.2
	9-14	Bw1	23.2	31.3	45.5
	14-19	Bw2	21.2	21.0	57.8
	19-32	Cr	34.1	26.7	39.2
	32-60	R	---	---	---
Dorothea:[1,6]					
(S64VI-30-1)	0-6	A	29.7	32.3	38.0
	6-11	Bt1	29.8	30.9	39.3
	11-19	Bt2	27.0	26.1	46.9
	19-30	B/C	---	---	---
	30-60	C	---	---	---
Glynn:[1,6]					
(S92VI-10-10)	0-4	A1	44.6	29.1	26.3
	4-10	A2	40.2	31.1	28.7
	10-17	Bt	36.7	20.6	42.7
	17-27	BC	39.2	27.9	32.9
	27-32	C	50.0	20.5	29.5
	32-41	2C	35.0	20.1	44.9
	41-60	3C	59.7	14.2	26.1
Hesselberg:[1,6]					
(S64VI-10-4)	0-7	A1	7.0	22.6	70.4
	7-12	A2	7.7	34.7	57.6
	12-17	Bk	5.7	27.1	67.2
	17-18	Bkm1	---	---	---
	18-24	Bkm2	---	---	---
	24-60	2C	---	---	---
Hogensborg:[1,6]					
(S64VI-010-2)	0-6	A	26.3	39.7	34.0
	6-13	AB	26.5	40.0	33.5
	13-23	Bss1	17.1	36.9	46.0
	23-31	Bss2	14.2	37.2	48.6
	31-43	Bkss1	12.9	35.7	51.4
	43-62	Bkss2	13.9	35.6	50.5
	62-76	2C	46.7	25.8	27.5
	76-88	3C	30.6	38.6	30.8

See footnotes at end of table.

Table 16.--Physical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In				
Maho Bay:[1,6]					
(S91VI-20-11)	0-7	A	26.5	47.4	26.1
	7-11	Bw	30.1	49.5	20.4
	11-22	Cr	23.1	57.1	9.8
	22-60	R	---	---	---
Maho Bay:[2,6]					
(S91VI-20-12)	0-4	A	30.7	42.3	27.0
	4-8	Bw	34.2	41.0	24.8
	8-16	Cr	33.4	45.6	21.0
	16-80	R	---	---	---
Parasol:[1,6]					
(S64VI-10-3)	0-7	A1	43.5	24.6	31.9
	7-13	A2	44.7	23.8	31.5
	13-24	Bw	45.1	20.9	34.0
	24-40	BC	51.6	24.1	24.3
	40-52	C1	64.2	23.0	12.8
	52-62	C2	64.8	21.9	13.3
	62-80	C3	77.4	12.8	9.8
Sion:[1,5,6]					
(S92VI-10-2)	0-6	A1	26.3	23.3	50.4
	6-12	A2	27.6	21.1	51.3
	12-16	Bk	32.0	20.2	47.8
	16-24	CBk	46.5	19.9	33.6
	24-32	C1	54.1	29.7	16.2
	32-60	C2	36.4	47.4	16.2
Sion:[3,5,6]					
(S91VI-010-1)	0-8	Ap	33.3	27.2	39.5
	8-13	B	30.3	28.5	41.2
	13-50	Ck	29.0	31.9	39.1
	50-80	Cr	---	---	---
Solitude:[1,6]					
(S91VI-20-5)	0-6	A2	61.0	25.4	13.6
	6-10	Bw	56.1	27.9	16.0
	10-17	Bg1	54.7	27.9	17.4
	17-28	Bg2	52.7	27.4	19.9
	28-57	Bg3	43.6	31.8	24.6
	57-61	Bg4	52.8	28.7	18.5
Sugar Beach:[1,6]					
(S92VI-10-12)	0-4	Oa	---	---	---
	4-8	Cg	---	---	---
	8-24	Oa1	---	---	---
	24-60	Oa2	---	---	---
Susannaberg:[1,6]					
(S91VI-20-8)	0-2	A	32.3	31.2	36.5
	2-9	Bw	29.0	29.7	41.3
	9-15	BC	30.5	34.8	34.7
	15-21	Cr	26.0	40.1	33.9
	21-60	R	---	---	---
Susannaberg:[4,6]					
(S91VI-20-14)	0-4	A	26.0	28.2	45.8
	4-14	Bt	19.4	28.9	51.7
	14-36	Cr	---	---	---

See footnotes at end of table.

Table 16.--Physical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	In				
Victory:[1,6] (S92VI-10-5)	0-6	A	37.7	41.0	21.3
	6-11	AB	41.5	39.4	19.1
	11-14	Bw1	50.2	33.8	16.0
	14-20	Bw2	51.8	30.8	17.4
	20-33	C	49.4	31.1	19.5
	33-50	Cr	55.4	28.8	15.8
	50-60	R	---	---	---

1 This is the typical pedon for the series. For the description and location of the pedon, see the section "Soil Series and Their Morphology."

2 This pedon is located on St. John Island, in the Maho Bay watershed, about 100 feet upslope from the location of sample number S91VI-20-11.

3 This pedon is located on St. Croix Island, about 0.2 mile northeast of the intersection of Routes 70 and 62, about 150 feet in a church play yard.

4 This pedon is located on St. John Island, in the Cinnamon Bay watershed, about 150 feet upslope from the location of sample number S91VI-20-13.

5 Includes carbonate clay.

6 Analyses by the National Soil Survey Laboratory, Natural Resources Conservation Service.

Table 17.--Chemical Analyses of Selected Soils

(Dashes indicate that analyses were not made. TR means trace.)

Soil name and sample number	Depth	Horizon	Extractable bases				Ex-tractable acidity	$CaCO_3$	Base saturation	Organic carbon	Reaction	Cation-exchange capacity
			Ca	Mg	Na	K						
	In		Meq/100g					Pct		Pct	pH	Meq/100g
Arawak:[1,5]	0-6	A1	---	2.4	0.3	0.4	---	36	100	2.47	7.9	---
(S92VI-10-8)	6-11	A2	---	1.8	0.5	0.2	---	37	100	2.14	8.1	---
	11-14	C	---	1.7	0.7	0.2	---	47	100	1.59	8.2	---
	14-23	Cr1	---	---	---	---	---	78	---	---	---	---
	23-30	Cr2	---	1.1	0.3	TR	---	60	100	0.65	8.2	---
	30-60	Cr3	---	---	---	---	---	76	---	---	---	---
Cinnamon Bay:[1,5]	0-3	A1	10.3	5.2	0.3	0.6	2.8	---	99	2.28	5.8	16.6
(S91VI-20-2)	3-11	A2	9.9	5.0	0.4	0.4	2.1	---	93	1.28	6.4	16.9
	11-21	Bw	8.9	5.5	0.5	0.3	1.4	---	96	0.49	7.1	15.8
	21-31	C1	6.3	4.0	0.6	0.3	0.9	---	98	0.13	7.3	11.4
	31-47	C2	7.0	2.9	1.0	0.4	1.0	---	86	0.10	7.5	13.2
	47-57	C3	6.3	5.7	1.5	0.3	0.3	TR	100	0.06	7.6	13.3
	57-60	C4	5.6	7.1	1.8	0.3	0.3	TR	100	0.06	7.5	12.4
Cramer:[1,5]	0-9	A	24.7	7.6	0.6	0.6	6.6	---	100	5.06	6.8	30.3
(S64-VI-10-6)	9-14	Bw1	14.2	5.9	0.7	0.3	7.4	---	96	1.34	6.2	21.9
	14-19	Bw2	16.0	6.0	1.1	0.4	8.4	---	96	0.93	5.8	24.5
	19-32	Cr	13.8	3.9	1.0	0.3	6.6	---	97	0.72	6.1	25.6
	32-60	R	---	---	---	---	---	---	---	---	---	---
Dorothea:[1,5]	0-6	A	17.4	12.2	0.7	0.5	11.7	---	100	3.68	6.1	29.1
(S64VI-30-1)	6-11	Bt1	15.9	13.2	0.8	0.2	10.1	---	100	1.70	6.1	30.1
	11-19	Bt2	17.8	16.6	1.1	0.3	9.1	---	100	0.77	6.1	31.0
	19-30	B/C	---	---	---	---	---	---	---	---	---	---
	30-60	C	---	---	---	---	---	---	---	---	---	---
Glynn:[1,5]	0-4	A1	11.8	7.0	0.6	1.2	4.9	---	98	2.52	7.0	21.1
(S92VI-10-10)	4-10	A2	12.7	6.4	0.6	0.7	4.0	---	96	1.36	6.9	21.2
	10-17	Bt	16.1	9.1	1.0	0.5	4.0	---	100	0.42	7.4	25.9
	17-27	BC	---	9.4	1.3	0.4	0.6	1	100	0.24	8.2	21.0
	27-32	C	---	10.3	2.2	0.4	---	1	100	0.09	8.5	19.0
	32-41	2C	---	18.3	4.2	0.3	---	9	100	0.12	8.7	25.1
	41-60	3C	---	15.9	4.6	0.3	---	13	100	0.07	8.9	17.1
Hesselberg:[1,5]	0-7	A1	---	4.2	0.4	2.2	5.9	2	100	3.99	7.4	46.1
(S64VI-10-4)	7-12	A2	---	4.1	0.6	1.5	5.2	2	100	2.81	7.4	41.7
	12-17	Bk	---	4.5	0.4	1.5	---	1	100	1.21	7.6	42.8
	17-18	Bkm1	---	---	---	---	---	---	---	0.30	---	8.9
	18-24	Bkm2	---	---	---	---	---	---	---	0.30	---	---
	24-60	2C	---	---	---	---	---	---	---	---	---	---
Hogensborg:[1,5]	0-6	A	---	7.1	0.5	0.8	---	3	100	1.03	7.8	22.8
(S64VI-10-2)	6-13	AB	---	8.0	1.2	0.6	---	3	100	1.10	7.8	23.2
	13-23	Bss1	---	13.7	5.7	0.6	---	9	100	0.25	8.2	25.4
	23-31	Bss2	---	15.7	10.4	0.6	---	6	100	0.16	8.3	25.8
	31-43	Bkss1	---	15.9	12.9	0.6	---	8	100	0.09	8.4	27.9
	43-62	Bkss2	---	15.9	11.4	0.6	---	8	100	0.08	8.4	29.2
	62-76	2C	10.9	9.6	5.8	0.4	1.2	TR	100	0.01	8.3	23.5
	76-88	3C	---	9.1	3.1	0.4	---	2	100	0.02	8.2	25.0

See footnotes at end of table.

Table 17.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Extractable bases				Ex-tract-able acid-ity	$CaCO_3$	Base satura-tion	Organic carbon	Reaction	Cation-exchange capacity
			Ca	Mg	Na	K						
	In		Meq/100g					Pct		Pct	pH	-Meq/100g-
Maho Bay:[1,5]	0-7	A	18.2	9.5	0.7	0.2	7.3	---	98	5.68	6.2	29.0
(S91VI-20-11)	7-11	Bw	3.2	5.5	0.7	0.2	11.4	---	60	2.32	5.0	16.0
	11-22	Cr	0.4	4.5	0.5	0.1	8.7	---	50	0.83	4.9	11.0
	22-60	R	---	---	---	---	---	---	---	---	---	---
Maho Bay:[2,5]	0-4	A	18.9	10.6	1.1	0.3	12.4	---	73	6.63	6.2	31.3
(S91VI-20-12)	4-8	Bw	5.2	9.2	1.0	0.2	10.8	---	63	3.35	5.0	24.8
	8-16	Cr	2.9	12.8	2.5	0.1	11.2	---	66	0.72	4.9	27.6
	16-60	R	---	---	---	---	---	---	---	---	---	---
Parasol:[1,5]	0-7	A1	21.6	8.2	0.2	0.4	11.2	---	100	1.76	5.3	29.5
(S64VI-10-3)	7-13	A2	24.4	8.3	0.3	0.4	8.2	---	100	1.42	6.0	29.5
	13-24	Bw	30.4	10.7	0.5	0.4	7.7	---	100	0.78	6.5	36.0
	24-40	BC	30.7	10.6	0.6	0.4	5.7	---	100	0.39	7.0	37.3
	40-52	C1	25.2	8.6	0.5	0.2	4.3	---	100	0.11	7.0	28.8
	52-62	C2	25.2	8.6	0.6	0.2	4.4	TR	100	0.12	7.3	29.1
	62-80	C3	25.4	8.7	0.4	0.1	3.7	---	100	0.06	---	29.3
Sion:[1,5]	0-6	A1	---	4.2	0.4	1.3	---	39	100	3.14	7.9	38.6
(S92VI-10-2)	6-12	A2	---	3.3	0.4	0.7	---	42	100	2.02	8.0	34.6
	12-16	Bk	---	2.3	0.4	0.6	---	53	100	1.56	8.1	25.3
	16-24	CBk	---	1.0	0.3	0.2	---	89	100	0.81	8.1	6.4
	24-32	C1	---	1.3	0.2	0.1	---	91	100	0.31	8.2	2.8
	32-60	C2	---	1.8	0.4	0.1	---	93	100	0.26	8.2	3.5
Sion:[3,5]	0-8	Ap	---	---	---	---	---	37	---	1.87	7.6	---
(S92VI-10-1)	8-13	B	---	---	---	---	---	35	---	1.69	8.2	---
	13-50	Ck	---	---	---	---	---	72	---	0.46	7.8	---
	50-80	Cr	---	---	---	---	---	---	---	---	---	---
Solitude:[1,5]	0-1	A1	3.8	5.3	2.1	0.2	2.9	---	100	1.22	5.2	10.2
(S91VI-20-5)	1-6	A2	3.7	6.3	3.5	0.1	2.0	---	100	0.79	6.0	11.3
	6-10	Bw1	4.0	6.8	4.0	0.2	2.0	---	100	0.45	7.0	11.5
	10-17	Bw2	4.1	7.2	4.3	0.2	0.3	---	100	0.35	7.3	11.6
	17-28	Bw3	4.1	7.9	5.0	0.2	0.5	TR	100	0.21	7.4	12.3
	28-57	Bg1	4.4	8.9	6.4	0.2	0.7	TR	100	0.21	7.4	14.2
	57-61	Bg2	4.8	9.7	8.6	0.2	---	---	100	0.44	7.2	12.3
Sugar Beach:[1,5]	0-4	Oa	40.4	65.8	143.0	4.3	14.2	---	100	42.2	6.8	103.8
(S92VI-10-12)	4-8	Cg	---	48.8	105.4	3.4	9.6	1	100	21.3	7.1	82.9
	8-24	Oa1	34.8	52.5	110.3	2.8	15.6	---	100	35.9	7.1	65.3
	24-60	Oa2	32.4	52.0	109.2	2.2	20.6	---	100	23.7	6.6	56.0
Susannaberg:[1,5]	0-2	A	28.5	10.6	0.5	0.6	6.9	---	96	3.75	7.2	41.7
(S91VI-20-8)	2-9	Bw	25.6	10.7	0.5	0.5	7.4	---	94	2.70	6.8	39.6
	9-15	BC	29.9	13.3	0.8	0.3	6.5	---	94	0.90	6.8	46.9
	15-21	Cr	31.2	16.0	0.9	0.4	6.6	---	96	0.63	6.5	50.5
	21-60	R	---	---	---	---	---	---	---	---	---	---
Susannaberg:[4,5]	1-0	Oi	---	---	---	---	---	---	---	---	---	---
(S91VI-20-14)	0-4	A	31.4	10.0	0.7	0.5	10.7	---	88	4.47	6.4	48.2
	4-14	Bt	26.1	11.1	0.7	0.4	11.4	---	82	2.48	6.1	38.3
	14-36	Cr	---	---	---	---	---	---	---	---	---	---

See footnotes at end of table.

Table 17.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Extractable bases				Ex-tract-able acid-ity	$CaCO_3$	Base satura-tion	Organic carbon	Reaction	Cation-exchange capacity
			Ca	Mg	Na	K						
	In		Meq/100g					Pct		Pct	pH	-Meq/100g-
Victory:[1,5] (S92VI-10-5)	0-6	A	14.9	6.7	0.4	0.1	5.9	---	89	2.60	6.7	24.9
	6-11	AB	14.7	5.4	0.6	0.1	5.6	---	90	1.13	6.3	23.2
	11-14	Bw1	18.4	6.7	0.6	0.1	5.2	---	93	0.56	6.4	27.8
	14-20	Bw2	18.6	7.3	0.6	0.3	5.2	---	94	0.44	6.2	28.5
	20-33	C/B	17.6	9.2	0.6	TR	4.8	---	95	0.21	6.5	28.7
	33-50	Cr	17.6	10.9	0.9	0.1	4.4	---	98	0.11	6.8	30.0
	50-60	R	---	---	---	---	---	---	---	---	---	---

1 This is the typical pedon for the series. For the description and location of the pedon, see the section "Soil Series and Their Morphology."

2 This pedon is located on St. John Island, in the Maho Bay watershed, about 100 feet upslope from the location of sample number S91VI-20-11.

3 This pedon is located on St. Croix Island, about 0.2 mile northeast of the intersection of Routes 70 and 62, about 150 feet in a church play yard.

4 This pedon is located on St. John Island, in the Cinnamon Bay watershed, about 150 feet upslope from the location of sample number S91VI-20-13.

5 Analyses by the National Soil Survey Laboratory, Natural Resources Conservation Service.

Table 18.--Classification of the Soils

Soil name	Family or higher taxonomic class
Annaberg	Loamy-skeletal, mixed, superactive, isohyperthermic Lithic Haplustolls
Aquents	Aquents
Arawak	Loamy-skeletal, carbonatic, isohyperthermic, shallow Typic Haplustolls
Carib	Fine-loamy, mixed, superactive, nonacid, isohyperthermic Mollic Endoaquepts
Cinnamon Bay	Fine-loamy, mixed, active, isohyperthermic Typic Haplustolls
Cramer	Clayey, mixed, active, isohyperthermic, shallow Typic Haplustolls
Dorothea	Fine, vermiculitic, isohyperthermic Typic Haplustalfs
Fredriksdal	Clayey-skeletal, vermiculitic, isohyperthermic Lithic Haplustolls
Glynn	Clayey-skeletal, mixed, superactive, isohyperthermic Typic Argiustolls
Hesselberg	Clayey, mixed, superactive, isohyperthermic, shallow Petrocalcic Paleustolls
Hogensborg	Fine, smectitic, isohyperthermic Sodic Haplusterts
Jaucas	Carbonatic, isohyperthermic Typic Ustipsamments
Jealousy	Fine, smectitic, isohyperthermic Typic Haplustolls
Lameshur	Loamy-skeletal, mixed, active, nonacid, isohyperthermic Typic Ustorthents
Maho Bay	Loamy, mixed, superactive, isohyperthermic, shallow Typic Haplustolls
Parasol	Fine, smectitic, isohyperthermic Typic Argiustolls
Redhook	Sandy-skeletal, carbonatic, isohyperthermic Typic Ustorthents
Sandy Point	Fine-loamy, mixed, superactive, nonacid, isohyperthermic Thapto-Histic Tropic Fluvaquents
Sion	Coarse-loamy, carbonatic, isohyperthermic Typic Calciustolls
Solitude	Fine-loamy, mixed, superactive, nonacid, isohyperthermic Aeric Tropaquepts
Southgate	Loamy-skeletal, mixed, active, isohyperthermic Lithic Ustropepts
Sugar Beach	Euic, isohyperthermic Fluvaquentic Troposaprists
Susannaberg	Clayey, vermiculitic, isohyperthermic, shallow Typic Haplustolls
Victory	Loamy-skeletal, mixed, superactive, isohyperthermic Typic Ustropepts