United States Department of Agriculture

Natural Resources Conservation Service

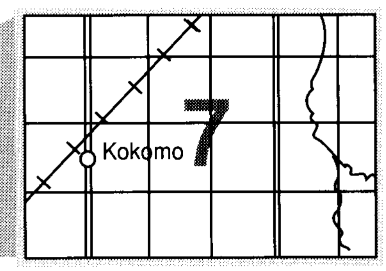
In cooperation with Cornell University Agricultural Experiment Station and the St. Regis Mohawk Tribe

Soil Survey of Akwesasne Territory: St. Regis Mohawk Reservation

How To Use This Soil Survey

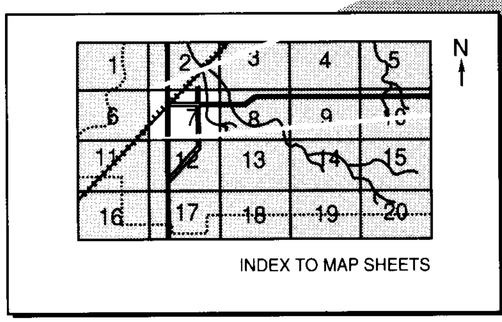
The detailed soil maps can be useful in planning the use and management of small areas.

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



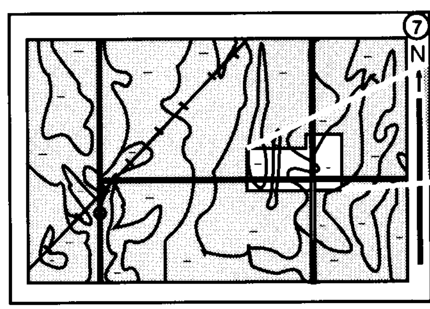
MAP SHEET

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

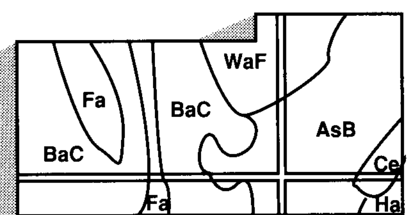


INDEX TO MAP SHEETS

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.



MAP SHEET



AREA OF INTEREST

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

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture, other federal agencies, the St. Regis Mohawk Tribe, state agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources 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 1997. 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 Cornell University Agricultural Experiment Station. It is part of the technical assistance furnished to the St. Regis Mohawk Tribe and the Franklin County Soil and Water Conservation District. Partial funding for this survey was provided through grants obtained by the St. Regis Mohawk Tribe.

Cover: John Thomas, an artist at Akwesasne, drew this map turtle. It illustrates the soil and underground aquifer below, supporting the mountains, grass, partridge and other creatures.

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Issued 2005

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 on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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

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

Joseph R. DelVecchio
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Akwesasne Territory: St. Regis Mohawk Reservation

By Theodore D. Trevail, Natural Resources Conservation Service

Fieldwork by Theodore D. Trevail, Soil Scientist, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Cornell University Agricultural Experiment Station and St. Regis Mohawk Tribe

The area of Akwesasne relative to this survey is on the south side of the St. Lawrence River at the confluence with the Raquette and St. Regis Rivers in the northern part of New York State. It is approximately 20 miles northwest of Malone, and about 8 miles east of the city of Massena. The Provinces of Ontario and Quebec, Canada are to the north, Franklin County is to the east, and St. Lawrence County is to the west (fig.1).

The shape of the reservation on the United States side is irregular. It has a length of about 7 miles from west to east, and a width of approximately 3 miles from north to south. The total area of Akwesasne south of the international line is 13,400 acres including 1,243 acres of census water.

An earlier soil survey of Franklin County, New York, which included the St. Regis Mohawk Reservation, was published by the United States Department of Agriculture, Soil Conservation Service, in cooperation with Cornell University Agricultural Experiment Station in May 1958 (U.S. Department of Agriculture, Soil Conservation Service, 1958). This survey updates the 1958 survey, provides additional interpretative information, and typically shows the delineation of soils in greater detail on aerial photographs.

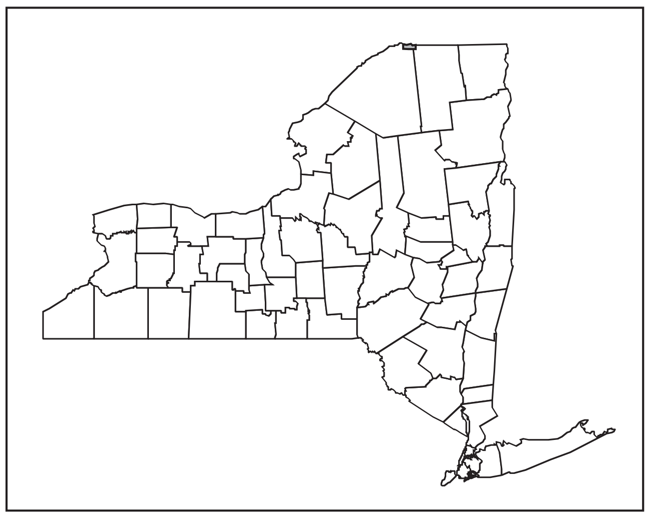

Figure 1.—Location of Akwesasne Territory: St. Regis Mohawk Reservation.

General Nature of Akwesasne

This section was written by Sally Benedict, Cultural Historian at Akwesasne.

Akwesasne is a Mohawk word that means: “Place where the Partridge live.”

Some say that Akwesasne was named for its historical abundance of wild partridge. Some say that the name comes from a sound made by the water moving under the ice-frozen St. Lawrence River, which mimics the sound that partridge make.

Akwesasronen means: “People who dwell in the place of the partridge.”

Introduction: The Mohawk territory at Akwesasne is traditional ancient homeland. It is the legacy that has been given to us by our ancestors and predecessors, and has been used and occupied by our people since time immemorial. Archaeological evidence shows aboriginal presence from at least 7,000 B.C., after the retreat of the ice sheet. Numerous islands and mainland within Akwesasne still hold this valuable historic information.

A Brief History of Akwesasne: The territory that is known as Akwesasne is aboriginal territory that has been used by Mohawk ancestors and predecessors since at least 7,000 B.C. Mohawk people inhabiting central villages in the Mohawk valley from about 1,000 B.C. utilized this territory along the St. Lawrence for hunting, fishing, and trading.

The more contemporary Mohawk community at Akwesasne was established in the early 1700s, within Mohawk territory. The community government was entrenched by the community charter known to us as the Okwaho Kaionwi ne Akwesasne or Akwesasne Wolf Belt.

The Mohawks and their ancestors have had an intimate relationship with the environment at Akwesasne for millennia. Our people developed a very self-sufficient lifestyle within this territory utilizing the resources of the lands and waters, and developing environmentally sustainable and culturally appropriate agricultural practices.

Community Location: The Mohawk community of Akwesasne is situated along the 45th parallel, within the beautiful St. Lawrence River Valley and is composed of mainland territories and numerous scenic islands within the *Kaniatarowanenneh* (St. Lawrence River). The aboriginal territory known as Akwesasne was quite expansive, taking in a great deal of the St. Lawrence River Valley between Gananoque, Ontario, and Valleyfield, Quebec. The contemporary land base has been seriously diminished from its original expanse, leaving the reserved land base at approximately 26,000 acres (this does not include our Aboriginal waters and waterways or Aboriginal lands in dispute).

Today the Akwesasne community is located less than 72 miles west of Montreal and only 62 miles from Ottawa. Akwesasne is composed of four residential districts on islands and mainland including: *Kanatakon, Tsi Snaihne, Kawehnoke,* and *Tekaswenkarorens*.

International Border: Despite Akwesasne protests, the Treaty of Paris of 1783 enabled the U.S.-Canada border to be placed directly through this Mohawk Community along the 45th parallel. Even though the Mohawks of Akwesasne consider themselves to be one community, the impact of the international boundary has been damaging to the integrity of the community structure. As a further complication, the inter-provincial boundary between the provinces of Ontario and Quebec, further dissected the northern sector of Akwesasne.

The border acted as an encumbrance to our people for the last two centuries. It is only the recent Canadian Federal Court of Appeal decision in Mitchell vs. the Minister of National Revenue, 1998, that has aided to reconcile our use of our Aboriginal Border Crossing Rights in modern terms.

Akwesasne Today: The population of this community numbers around 13,000 people, who reside in the districts of Kawenoke, Kanatakon, Tsi Snaihne, and Tekaswenkarorens, as well as several of our islands. The territory is accessed by a system of international bridges, highways and waterways that cross the St. Lawrence River, and connect the mainlands and several islands.

Our people are very community centered, and many of our talented people find work within Akwesasne, in a great variety of fields. Our community services utilize our cultural ideals and principles as their foundation and provide programs and services, which are culturally appropriate and supportive of our beliefs, values, and practices.

Utilizing our cultural principles and foundations, Akwesasne has its own elementary school principals, teachers and support staff; doctors, nurses and a myriad of health care service providers; community infrastructure technicians for the numerous roads, waterlines, and buildings; police officers, lawyers, judges and various judicial technicians; researchers, environmentalists, biologists and conservation officers; management, administration, support staff and professional personnel.

Sacred Trust Responsibility

The People and the Land are One: The aboriginal territory of Akwesasne was quite expansive. Some of the very familiar contemporary towns and villages that we know so well today, find their origin within the aboriginal territory of Akwesasne. Some of them included Massena, Waddington, Hogansburg, Bombay, Moira, and Fort Covington, New York. On the Canadian side of the international border, it included places like Sommerstown, Williamstown, Lancaster, Cornwall and Morrisburg, Ontario. In Quebec it included places like Dundee, St. Anicet, and Cazaville.

Mohawks and their ancestors and predecessors utilized the special aspects, and features of this territory, benefiting from the great variety of animal, fish, bird and plant life for our diets and utilizing the trees, plant medicines, and waters of the area for the treatment of our ailments.

Our aboriginal territory is the land base that takes care of us from the time we were born to the time that we were returned to the earth in a grave. Our people refer to the Earth as our Mother. We are dependent on her for nourishment, sustenance, and the natural resources that are derived from her and provided for the people.

Mohawk people naturalized to the area over time and understood the intricate sciences and phenomenon of the area. The knowledge system built on this region is passed from generation to successive generation. We are dependent on this knowledge for our survival.

Climate

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate Tables are created from climate station Massena FAA AP, New York.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Burlington, Vermont.

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

In winter, the average temperature is 17.0 degrees F and the average daily minimum temperature is 7.5 degrees. The lowest temperature on record, which occurred at Massena on January 15, 1957, was -44 degrees. In summer, the average temperature is 66.5 degrees and the average daily maximum temperature is 77.8 degrees. The highest temperature, which occurred at Massena on August 1, 1975, was 100 degrees.

Growing degree days are shown in Table 1. They are equivalent to “heat units”. During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 34.11 inches. Of this, about 16.0 inches, or 47 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.97 inches at Massena on September 14, 1979. Thunderstorms occur on about 23 days each year, and most occur in June, July, or August.

The average seasonal snowfall is 70 inches. The greatest snow depth at any one time during the period of record was 44 inches recorded on March 9, 1971. On an average, 100 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 17.0 inches recorded on April 22, 1993.

The average relative humidity in mid-afternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 77 percent. The sun shines 62 percent of the time in summer and 40 percent in winter. The prevailing wind is from the southwest. Average wind speed is highest, around 10 miles per hour, from November to April.

Geology and Physiography

Prepared by David Sullivan, Geologist, USDA, Natural Resources Conservation Service

The St. Regis Mohawk Reservation is part of the St. Lawrence-Champlain Lowlands Physiographic Province. The province is the northern-most physiographic province in New York, and includes the St. Lawrence Valley northeast of the Thousand Islands, the low hills south of the river valley, and the Lake Champlain Valley.

The St. Lawrence valley plain has a maximum elevation of about 1,300 feet where it merges with the Adirondack Mountains to the south. Its slope is long and gentle as it extends north and west, and the elevation at its lowest point near the St. Lawrence River is about 160 feet above mean sea level (m.s.l).

Elevation on the St. Regis Reservation ranges from a low of about 160 feet above m.s.l. in the northeast, to a high of 230 feet near Raquette Point Light, and at several other ridge locations.

The bedrock geology in the Franklin County area of New York consists of igneous and metamorphic rocks in the southern and middle sections, and sedimentary rocks in the north. The igneous and metamorphic rocks are associated with the Adirondack Mountains, and are part of a broad belt of rocks called the Grenville Province. The province extends southward along the west side of the Appalachian Mountains from Labrador to Mexico, and was formed during the Precambrian Era of geologic time (approximately 1 billion years ago). Rocks of the Grenville Province are the oldest in the county, and are also the basement rocks for all of New York state.

In the St. Lawrence Valley, sedimentary bedrock dominates. It is undeformed to very gently folded and dips northward at an angle of less than 5 degrees. The rocks become younger in a northward direction as they grade from Cambrian age sandstone (500 to 550 million years old) north of the Adirondacks, to Ordovician age dolostone (430 to 500 million years old) near the St. Lawrence River. All of the rocks were deposited on top of the older Grenville basement rocks.

At the St. Regis Reservation, the underlying bedrock is Ogdensburg dolostone of the Beekmantown Group (Obk). It is exposed in a few places, such as in channels of large streams, and on a few low ridge slopes, but for the most part is deeply buried under glacial drift.

Glacial Geology

The St. Regis Mohawk Reservation was completely covered by ice during the Pleistocene Epoch of geologic time. The epoch began approximately 1.6 million years ago when an ice sheet, located in the Laurentian Mountain region of Quebec and Labrador, moved south and southwestward into New York state. As the glacial ice advanced, it covered all of New York State except for a small section of Allegany State Park in Cattaraugus County.

The ice sheet was several thousand feet thick in some places, and flowed across New York in connected streams called lobes. The Erie Lobe flowed southeastward out of the Erie Basin. The Hudson-Champlain Lobe moved through the Champlain and Hudson Lowlands and eventually reached Long Island. Parts of this lobe also spread into the Adirondack, Catskill and Taconic Mountains, as well as into the Mohawk Valley. The Ontario Lobe flowed southwest across the St. Lawrence and Ontario Lowlands, then moved south and southeast into the Appalachian and Tug Hill Uplands. As the ice advanced it stripped away tons of soil and rounded off resistant rock ridges and hills. Eroded materials ranging in size from clay particles to giant boulders were transported along with the ice mass and deposited whenever the sediment load became excessive.

Although there have been four major advances and retreats of the Laurentide Ice Sheet documented in the United States, only the last stage is evident in New York state. All previous stages appear to have been obliterated by the Wisconsin Stage, which advanced to its maximum location just south of Long Island. This last advance began a final retreat northward about 10,000 years ago as the Pleistocene Epoch came to a close.

Prior to its retreat, ice had covered northern Akwesasne like a thick blanket. The great thickness of ice caused the underlying earth's crust to sag. As the ice retreated northward, and the great weight was gradually removed, the crust began to rebound, but at a slower rate than the retreating ice. As a result, ocean water flooded into the northern part of the Champlain and St. Lawrence Valleys, and for a short time created the ancient Champlain Sea. Evidence for this event can be seen in the marine shells that have been found in the soils of the region.

Soils on the St. Regis Reservation reflect this saltwater intrusion. Most soils are laminated to massive marine and lacustrine silts and clays. They were deposited in a brackish to salt water environment, and their thickness varies from 1 to 50 meters. Some of the soils may even include fossil shells. The Muskellunge and Adjidaumo soils are examples of these deposits.

In addition to the marine soils, the other major deposit is glacial till. Ridges of till material are scattered from east to west across the reservation. The ridges generally trend in a northeast to southwest direction, and are the result of deposition beneath the glacial ice. These loamy soils include the Grenville and Hogansburg series.

The remaining soils consist of recent deposits of fine sand to gravel (alluvium and outwash) in association with stream channels of the St. Regis and Raquette rivers (USDA, Soil Conservation Service, 1958).

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

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

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

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

The section “Survey Procedures” explains specific procedures used to make this survey.

Survey Procedures

The general procedures followed in making this soil survey are described in the National Soils Handbook of the Natural Resources Conservation Service and the Soil Survey Manual. The Soil Scientist utilized existing soil information from the 1958 Soil Survey of Franklin County, New York prior to the start of the project.

Before field work began, preliminary boundaries of slopes and landforms were plotted stereoscopically on aerial photographs taken in 1982. The map scale used for the survey was 1:24,000. Color infrared aerial photographs were also used to aid mapping. The soil scientist also studied U.S. Geological Survey topographic maps, at a scale of 1:24,000, to relate landform, slope, and image features to the area of survey. Commonly, a reconnaissance was made by vehicle to examine road cuts and surface features before the landscape was traversed on foot.

Sample areas were selected to represent the major landscapes in Akwesasne. These areas were investigated to determine soil-landform relationships, diversity of soil types within landforms, and other data related to land use interpretations. Field notes and profile descriptions were taken to document soil series and map units. As mapping progressed, these preliminary notes were used to define map unit composition. In most areas with complex soil patterns, traverses were about 100 yards apart.

As the traverses were made, the soil scientist divided the landscape into landforms or landform segments based on use and management of the soils. For example, a hill would be separated from a depression, and a gently sloping summit from a back slope of a ridge. In most areas, soil examinations along the traverses were made 100 to 300 yards apart, depending on the landscape and soil pattern.

Observations of such items as landform, blown-down trees, vegetation, road-cuts, animal burrows, stoniness, and bedrock outcrops were made without regard to spacing. Soil boundaries were determined on the basis of soil examinations, observations, and photo interpretation. Soil material was examined with the aid of a hand auger and a spade to a depth of 4 to 6 feet, or to bedrock within a depth of 6 feet. The pedons described as typical were observed and studied in pits that were dug with shovels or backhoes within Major Land Resource Area (MLRA) 142.

Samples for chemical and physical analyses and for analyses of engineering properties were taken from representative sites of several of the soils near the survey area within MLRA 142. Most of this sampling occurred between 1980 and 1986. The chemical and physical analyses were made by the Soil Characterization Laboratory, Department of Soil, Crop, and Atmospheric Sciences at Cornell University, Ithaca, New York; and by the National Soil Survey Laboratory, Natural Resources Conservation Service, Lincoln, Nebraska. The results of the analyses are stored in computerized data files at the respective laboratories. The analyses for engineering properties were made by the New York State Department of Transportation, Soil Mechanics Bureau. A description of the laboratory procedures can be obtained on request from the respective laboratories. The results of the studies can be obtained from Cornell University, the New York State Department of Transportation, and the state office of the Natural Resources Conservation Service.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in 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.

A map unit delineation on a soil 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. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils 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 minor components that belong to taxonomic classes other than those of the major soils.

Most minor 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, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. 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 contrasting components are mentioned in the map unit descriptions. A few areas of minor components 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 minor components 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. If intensive use of small areas is planned, however, 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, Adams loamy sand, 0 to 3 percent slopes is a phase of the Adams series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, 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. The map unit, 94B Neckrock–Summerville complex, gently sloping, rocky 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. The map unit 110 Borosaprists and Fluvaquents, 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. The map unit 105 Udorthents, smoothed is an example.

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

2—Lovewell very fine sandy loam, stratified substratum

This soil is very deep, nearly level and moderately well drained. It is on floodplains of large perennial streams that occasionally flood for brief periods. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 11 inches, dark brown very fine sandy loam

Subsoil:
11 to 20 inches, yellowish brown very fine sandy loam
20 to 30 inches, yellowish brown very fine sandy loam with common mottles

Substratum:
30 to 50 inches, light brownish gray very fine sandy loam with many mottles
50 to 56 inches, grayish brown fine sand with many mottles
56 to 75 inches, gray fine sand with many mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Cornish soils and very poorly drained Medomak soils in slightly concave areas and near tributaries. Also included are soils that are similar to Adams, Croghan, or Colton soils on slightly higher positions that rarely flood. Some areas of the St. Regis River floodplains have higher sand and rock fragment content than typical of Lovewell soils. About 5 percent of this map unit is well drained loamy soil on more convex positions. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, subsoil, and upper substratum, and rapid in the lower substratum below 50 inches
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 18 to 36 inches deep at some time from November through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are idle or in hay. This soil meets the requirements for prime farmland.

This soil is well suited to growing cultivated crops and hay. The seasonal high water table may delay planting during early spring or after heavy rainfall. Installing a drainage system, especially in somewhat poorly drained inclusions, will increase the efficiency of farm operations. Conservation tillage systems and crop rotations are good management practices.

This soil is well suited to pasture. The seasonal high water table during early spring can cause muddy barn yards and less forage density in some areas of this soil. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing eastern white pine on this soil is very high. Although there are no major management limitations, brush control is important to subdue plant competition around seedlings. Also, there is a moderate windthrow hazard because of root restriction above the seasonal high water table.

The main limitations if this soil is used as a site for dwellings with basements are the seasonal high water table and its common flooding potential. A better suited site should be considered, such as soils on a higher nearby area.

Flooding and potential frost action are the main limitations if this soil is used for local roads and streets. Roads should be routed around these flood prone areas where possible. Coarse-grain fill material protected by riprap or other structures may reduce flood damage and frost action.

The main limitations of this soil for septic tank absorption fields are the seasonal high water table, the potential for flooding, and the poor filter in the lower, sandier substratum. A better suited site should be considered for this use, such as a higher nearby area not prone to flooding.

The main limitations of this soil for shallow excavations are the seasonal high water table and the soil's tendency to cave in. Digging operations may be restricted to drier periods of the year. Sloughing of soil in the excavated area may also occur because of wetness. The banks of the excavation should be mechanically supported to avoid the possibility of soil caving in on workers or other possible victims.

The capability subclass is 2w.

5—Fluvaquents-Udifluvents complex, frequently flooded

This unit consists of very deep sediments deposited by rivers and streams on floodplains. Frequent flooding from nearby rivers and streams generally results in the erosion and redeposition of soil material from one place to another within this unit. Fluvaquents occur on slightly concave positions such as abandoned stream channels and stagnant-water areas. Udifluvents occur on slightly convex positions such as low benches and small islands near active stream channels. This unit consists of about 30 percent poorly drained and 20 percent somewhat poorly drained Fluvaquents, 40 percent well drained Udifluvents, and 10 percent other soil types. Fluvaquents and Udifluvents are so intermingled on the landscape that it was not practical to map them separately. Slopes range from 0 to 3 percent.

The sequence, depth, and composition of a pedon of Fluvaquents is variable, but the general range of the soil characteristics are as follows—

Surface:
0 to 8 inches; black to very dark grayish brown sandy loam to mucky silt loam with variable amounts of gravel and cobbles

Substratum:
8 to 72 inches; very dark gray to pale olive sandy loam to silty clay loam with variable amounts of gravel and cobbles. It commonly has mottles.

The sequence, depth, and composition of a pedon of Udifluvents is also variable, but the general range of the soil characteristics are as follows—

Surface:
0 to 4 inches; very dark brown to light yellowish brown loamy sand to loam with variable amounts of gravel and cobbles

Substratum:
4 to 72 inches; dark brown to olive stratified layers of deposits from sand to silty clay loam with variable amounts of gravel and cobbles

Included with this unit in mapping are about 5 percent moderately well drained Lovewell soils and somewhat poorly drained Cornish soils on slightly higher areas near large streams where soil textures are more uniform. Small areas of poorly drained Rumney and very poorly drained Medomak soils occur in slight depressions away from the active stream channel. Small areas of very poorly drained Wonsqueak soils occur in bog-like areas at the margin of flood plains. Also included are small areas of well drained soils similar to Adams or Colton. Included areas make up about 10 percent of this unit and range up to 5 acres each.

Soil Properties

Fluvaquents

Permeability: ranges from slow to rapid; onsite investigation needed
Available water capacity (average for 40-inch profile): ranges from very low to high; onsite investigation needed
Depth to seasonal high water table: 6 inches above the surface to 18 inches deep at some time from October to June
Root zone: mainly to 12 inches deep
Shrink-swell potential: low; onsite investigation needed
Depth to bedrock: greater than 60 inches

Udifluvents

Permeability: ranges from slow to rapid; onsite investigation needed
Available water capacity (average for 40-inch profile): ranges from very low to high; onsite investigation needed
Depth to seasonal high water table: 24 to 72 inches deep at some time from November to May
Root zone: mainly to 20 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this unit are in brush or woodland.

The variability of its characteristics and frequent flooding are major limitations for most uses of this unit other than wetland wildlife habitat.

The capability subclass is 5w.

6—Redwater fine sandy loam

This mapping unit consists of deep, somewhat poorly drained soils that have formed in recent alluvium. It is on flood plains along streams where the stream gradient is controlled by bedrock. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 7 inches, very dark grayish brown fine sandy loam

Subsoil:
7 to 30 inches, dark brown fine sandy loam
30 to 38 inches, very dark grayish brown and dark brown fine sandy loam

Substratum:
38 to 50 inches, grayish brown and light brownish gray fine sandy loam
50 inches, hard limestone bedrock

Included with this unit in mapping are about 10 percent Fluvaquents, Udifluvents, and Borosaprists where frequent flooding occurs at the edge of streams or in slack water areas. Cornish soils are included in places where the alluvium is dominated by silt and very fine sand. Included areas range up to 5 acres and make up about 20 percent of this unit.

Soil Properties

Permeability: moderate in the surface and subsoil, and moderately rapid in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 6 to 18 inches from November through May
Root zone: mainly in the upper 20 inches
Shrink-swell potential: low
Depth to bedrock: 40 to 60 inches

Much of this unit is used as hayland. Other areas are in woodland or brush.

This unit is moderately suited to growing cultivated crops and hay. Planting is frequently delayed because of wet soil conditions or flooding. The seasonal high water table limits the root growth of some legumes. Installing subsurface drainage and selecting shallow-rooted, water-tolerant grasses and legumes are ways to enhance the productivity of pasture on this unit. In places, fields may suffer detrimental deposition from stranded stones and trash left by ice. Cover crops or sod crops in the cropping system protect the surface of the soil from scouring during flooding. Tree borders and riparian strips can help to stabilize stream banks.

This soil is moderately suited to pasture management. Grazing these soils when wet can lead to punching and compaction of the surface layer. Keeping stock off of pastures during early spring and other wet periods will help prevent excessive compaction and help to maintain good soil tilth. Protecting stream banks with fences and tree borders will help to limit stream bank erosion.

The potential productivity for red maple on this unit is moderate. Flooding and the seasonal high water table can impede heavy equipment use during spring and other wet periods.

This soil is unsuited for dwellings with basements. Flooding and soil wetness are severe limitations to the use of this unit as a site for dwellings with basements. The best solution is to select a better suited soil on a higher landscape position.

Soil wetness, flooding, and potential frost action are the main limitations if this soil is used as a site for local roads and streets. Constructing roads on raised fill material and installing a drainage system are methods of compensating for soil wetness and flooding. Providing coarser grained subgrade material to frost depth will help prevent pavement damage.

This soil is poorly suited as a site for septic tank absorption fields because of flooding, wetness, and the moderately rapid permeability in the substratum. Generally the best alternative is to place the septic field on a better suited soil higher on the landscape.

The main limitations of this soil for shallow excavations are the depth to bedrock and the seasonal high water table. Digging may be impeded by bedrock contact making blasting necessary in some areas. Also, construction and installation may be restricted to drier periods of the year unless drainage is enhanced.

The capability subclass is 3w.

15B—Waddington gravelly loam, 3 to 8 percent slopes

This soil is very deep, gently sloping and somewhat excessively drained. It occurs on very gravelly, glacial outwash plains and beach ridges.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown gravelly loam

Subsoil:
9 to 17 inches, strong brown very gravelly fine sandy loam
17 to 26 inches, brown very gravelly loam
26 to 31 inches, dark brown very gravelly loamy sand

Substratum:
31 to 72 inches, mixed dark grayish brown, brown, and dark yellowish brown extremely gravelly coarse sand

Included with this soil in mapping are about 5 percent moderately well drained Fahey soils in slightly concave and nearly level areas. About 5 percent of this unit includes soils similar to Colton and Trout River where conditions are more acid or sandier.

About 5 percent of this unit includes small areas of moderately well drained Hogansburg soils adjacent to loamy glacial till. Also included are small areas having sand over loamy deposits, nearly level areas, and shallow deposits of gravel over loamy till. In some areas, the surface was cobbly loam or very gravelly loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, moderately rapid in the upper part of the subsoil, and rapid in the lower part of the subsoil and substratum.
Available water capacity (average for 40-inch profile): low or moderate
Depth to seasonal high water table: greater than 72 inches deep
Root zone: generally unrestricted
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hayland or brushland.

This soil is well suited to growing cultivated crops and hay. During dry periods, droughtiness can significantly reduce yields and increase weed competition. On long cultivated slopes, erosion may be serious enough to lower crop production if not protected from water movement. Because of the rapid permeability in the substratum, the potential for pesticide and nutrient loss from leaching in this soil is high. Conservation tillage systems, crop rotations, manure application at a level to meet crop needs, and the use of cover crops are good management practices.

This soil is well suited to pasture. Mild droughtiness during the summer may threaten optimum forage production on this soil. Overgrazing should be avoided. Rotational grazing, proper stocking rates, and yearly mowing are good management practices.

The potential productivity for growing sugar maple on this soil is moderate. Tree species tolerant to short periods of droughtiness should be encouraged.

There are no major limitations if this soil is used for dwellings with or without basements.

A moderate limitation of this soil for local roads and streets is frost action. Construction plans should specify sandier subgrade material. Adequate surface drainage in critical areas will also control potential frost action.

The main limitation of this soil for septic tank absorption fields is its rapid permeability in the substratum. Because of rapid permeability in the substratum, there is a possibility of ground water contamination.

The main limitations if this unit is used for shallow excavations is the soils tendency to cave in. Trench walls should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 3s.

18A—Adams loamy sand, 0 to 3 percent slopes

This soil is very deep, nearly level, and somewhat excessively drained. It occurs on nearly level sandy glacial outwash plains and terraces.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, very dark grayish brown loamy sand

Subsurface:
7 to 9 inches, pinkish gray sand

Subsoil:
9 to 11 inches, dark reddish brown loamy sand
11 to 13 inches, dark brown loamy sand
13 to 27 inches, strong brown sand

Substratum:
27 to 35 inches, yellowish brown fine sand
35 to 72 inches, brown sand

Included with this soil in mapping are about 5 percent moderately well drained Croghan soils in slight depressions and along shallow drainageways. About 5 percent are included areas with high gravel content similar to Colton or Waddington soils. Also included are similar soils having thin layers of very fine sand or silt in the substratum as well as soils lacking stratification in the substrata. In some areas the surface texture is sand, fine sand, or loamy fine sand. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the surface and subsoil, and very rapid in the substratum.
Available water capacity (average for 40-inch profile): very low or low
Depth to seasonal high water table: greater than 72 inches deep
Root zone: generally unrestricted
Shrink-swell potential: low
Depth to bedrock: greater than 72 inches

Most areas of this soil are used as woodland. The majority of areas that were once farmed have since reverted to brush and woodland.

This soil is moderately suited to growing cultivated crops and hay. Droughtiness can limit productivity of this soil because of its very low available water capacity. Amendments of organic matter will improve the soils moisture holding ability and structure. Because of the rapid permeability in this soil, the potential for pesticide loss from leaching in this soil is high. Conservation tillage systems, crop rotation, the proper application of manure and soil amendments are good management practices on this soil.

This soil is moderately suited to pasture. Droughtiness can affect the quantity and quality of forage. Rotational grazing and proper stocking rates are good management practices on this soil.

The potential productivity for growing eastern white pine on this soil is very high. Because of the very low available water capacity, droughty conditions can severely affect seedling mortality. Included areas of Croghan soils may have higher seedling survival rates.

There are no major limitations for dwellings with or without basements on this soil.

There are no major limitations for local roads and streets on this soil.

The main limitation if this soil is used for septic tank absorption fields is its poor ability to filter effluent properly. There is a possibility of ground water contamination because of the soil's rapid permeability. A better suited site should be considered for this use such as a moderately rapid, permeable soil on a nearby landform.

The main limitation if this soil is used for shallow excavations is the danger of cut banks caving in. Precautions can be taken to protect workers and other possible victims.

The capability subclass is 3s.

18B—Adams loamy sand, 3 to 8 percent slopes

This soil is very deep, gently sloping, and somewhat excessively drained. It occurs on sandy glacial outwash plains and terraces.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, very dark grayish brown loamy sand

Subsurface:
7 to 9 inches, pinkish gray sand

Subsoil:
9 to 11 inches, dark reddish brown loamy sand
11 to 13 inches, dark brown loamy sand
13 to 27 inches, strong brown sand

Substratum:
27 to 35 inches, yellowish brown fine sand
35 to 72 inches, brown sand

Included with this soil in mapping are about 5 percent moderately well drained Croghan soils in slight depressions and along shallow drainageways. About 5 percent of this unit includes soils similar to Colton and Waddington having high gravel content. Also included are similar soils having thin layers of very fine sand or silt in the substratum as well as soils lacking stratification in the substrata. Narrow inclusions of more sloping areas are included. In some areas the surface texture is sand, fine sand, or loamy fine sand. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the surface and subsoil, and very rapid in the substratum
Available water capacity (average for 40-inch profile): very low or low
Depth to seasonal high water table: greater than 72 inches deep
Root zone: generally unrestricted
Shrink-swell potential: low
Depth to bedrock: greater than 72 inches

Most areas of this soil are in woodland. The majority of areas that were once farmed have since reverted to brushland or woodland.

This soil is moderately suited to growing cultivated crops and hay. Droughtiness can limit soil productivity because of very low available water capacity of this soil. Amendments of organic matter will improve the moisture holding ability and structure of the soil. Erosion may also be a management problem on long slopes resulting in reduced crop yields. Because of the rapid permeability in this soil, the potential for pesticide loss from leaching in this soil is high. Conservation tillage systems, crop rotation, the use of cover crops and manure, and the proper application of soil amendments are good management practices on this soil.

This soil is moderately suited to pasture. Droughtiness can negatively affect the quantity and quality of forage. Rotational grazing and proper stocking rates are good management practices on this soil.

The potential productivity for growing eastern white pine on this soil is very high. Because of the very low available water capacity, droughty conditions can severely affect seedling mortality. Included areas of Croghan soils may have higher seedling survival rates.

There are no major limitations for dwellings with or without basements on this soil.

There are no major limitations for local roads and streets on this soil.

The main limitation if this soil is used for septic tank absorption fields is its poor ability to filter effluent properly. There is a possibility of ground water contamination because of the soil's rapid permeability. A better suited site should be considered for this use such as a moderately rapid, permeable soil on a nearby landform.

The main limitation if this soil is used for shallow excavations is the danger of cut banks caving in. Precautions should be taken to protect workers and other possible victims.

The capability subclass is 3s.

20A—Croghan loamy fine sand, 0 to 3 percent slopes

This soil is very deep, nearly level, and moderately well drained. It formed in low lime, sandy deposits on outwash plains, terraces, deltas, and lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:

1 inch thick layer of roots and sphagnum moss
0 to 1 inch, black moderately decomposed organic material
1 to 3 inches, black loamy fine sand

Subsoil:

3 to 9 inches, pinkish gray fine sand
9 to 11 inches, dark reddish brown fine sand
11 to 16 inches, reddish brown and dark reddish brown fine sand
16 to 33 inches, brown fine sand with common mottles

Substratum:

33 to 72 inches, pinkish gray fine sand with many mottles

Included with this soil in mapping are about 5 percent Adams soils on higher areas of the unit. About 5 percent of this unit includes somewhat poorly drained Wainola soils and poorly drained Deinache soils along drainageways and in slight depressions. Included in mapping are small areas of Flackville and Swanton soils where silt and clay deposits are within 40 inches of the surface. Also included are small areas of Occur soils where loamy material is within 40 inches of the surface. In some areas the surface texture is loamy sand. Inclusions make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the surface and very rapid in the subsoil and substratum
Available water capacity (average for 40-inch profile): very low to low
Depth to seasonal high water table: 18 to 24 inches deep at some time from November through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in hayland or woodland. Some areas are in pastureland.

This soil is well suited to growing cultivated crops and hay. The seasonal high water table may delay farming operations following periods of heavy precipitation. Surface and subsurface drainage systems will help to improve the efficiency of farm operations and increase crop yield, especially in areas of somewhat poorly drained inclusions. Because of the very low available water capacity, this sandy soil may be droughty during part of the growing season. Applications of organic matter will help improve the water holding capacity of this soil. Conservation tillage systems, crop rotation, establishing a cover crop, maintenance of waterways, and the addition of manure and other supplements are good management practices.

This soil is well suited to pasture. Soil wetness during the early part of the growing season may retard forage growth, especially in included areas of Wainola and Deinache soils. Droughtiness during the late summer may also diminish the potential forage on this soil. Excessive grazing should be avoided so as to sustain desirable pasture plant species. Rotational grazing, proper stocking rates, and yearly mowing are good management practices.

The potential productivity for growing eastern white pine on this soil is high. Seedling mortality can be a moderate management problem with some tree species because of low available water capacity. Drought-tolerant seedlings that are planted during moist soil conditions promote seedling survival.

The main limitation of this soil for dwellings is the seasonal high water table. Nearby units of Adams soils are better suited to this use. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitations of this soil for local roads and streets are a moderate potential for frost action and the seasonal high water table. Road designs can specify using a coarser grained subgrade material to alleviate frost action. Adequate surface and subsurface drainage in critical areas will also decrease the potential for frost action and seasonal wetness.

The main limitations of this soil for septic tank absorption fields are its poor filtering ability and the seasonal high water table. If this soil is used, higher spots within the map unit would likely perform better for this use. Conventional septic system designs may perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered. Because of very rapid permeability, there is a possibility of ground water contamination by septic effluent.

The main limitations of this soil for shallow excavations are the tendency for cutbanks to cave in and the seasonal high water table. Digging operations may be restricted after periods of heavy rainfall unless drainage is installed. Mechanically supporting the banks of the excavation will help prevent the possibility of soil caving in on workers or other victims.

The capability subclass is 2w.

33—Wainola loamy fine sand

This soil is very deep, nearly level, and somewhat poorly drained. It formed in sandy deposits on relatively low and slightly concave areas of glacial outwash plains and lake plains. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 1 inch, black slightly decomposed roots and leaves
1 to 4 inches, black loamy fine sand

Subsurface:
4 to 7 inches, reddish gray and pinkish gray fine sand

Subsoil:
7 to 10 inches, dark reddish brown loamy fine sand with common mottles
10 to 12 inches, reddish brown fine sand with common mottles
12 to 22 inches, strong brown fine sand with many mottles
22 to 34 inches, brown fine sand with common mottles

Substratum:
34 to 72 inches, light brownish gray fine sand with few mottles

Included with this soil in mapping are about 5 percent moderately well drained Croghan soils on slightly higher positions. About 5 percent of this map unit consists of poorly drained Deinache soils near depressions and drainageways. Small areas of Coveytown soils are included where a loamy substratum occurs. Small areas of Swanton and Stockholm soils are included where a clayey substratum is within 40 inches. Also on similar landforms are inclusions of Sciota soils which are less reddish brown in the subsoil. Inclusions make up about 20 percent of this map unit and range up to 5 acres each.

Soil Properties

Permeability: rapid throughout
Available water capacity (average for 40-inch profile): low or moderate
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hayland. Some areas are used as brush or woodland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage will help to improve farm operation efficiency and increase crop yields. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table may limit forage production. Excessive grazing on this soil may result in compaction, muddy conditions, soil erosion, and loss of key forage species. Rotational grazing, deferred grazing, proper stocking rates, maintenance of drainageways, and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. Heavy equipment may bog down in wet soil causing severe erosion. Limited rooting depth over the seasonal high water table may moderately increase seedling mortality and severely increase windthrow in some areas. Selecting species that are tolerant to wet soil conditions will help improve seedling survival. Minimal thinning will also diminish windthrow potential.

The main limitation of this soil for dwellings is the seasonal high water table. Better suited sites on higher nearby areas should be considered. If this soil is used, foundation drains and protective coatings on basement walls will alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The seasonal high water table and frost action are moderate limitations if this soil is used for local roads and streets. Constructing roads on a raised coarser grained subgrade, and installing adequate drainage in critical areas will alleviate wetness and frost action.

The seasonal high water table and a poor filtering capacity limit the use of this unit as a site for septic tank absorption fields. A better suited site should be considered. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered. Because of the rapid permeability, there is a possibility of ground water contamination.

The main limitation if this soil is used for shallow excavations is the seasonal high water table and the soil's tendency to cave in. Digging operations may be restricted to drier periods of the year unless a drainage system is installed. Sloughing of soil in the excavated area may also occur because of wetness. Trench walls should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 3w.

39A—Churchville silty clay loam, 0 to 3 percent slopes

This soil is very deep, nearly level and somewhat poorly drained. It occurs on swales and smooth areas on glacial till plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:

0 to 7 inches, very dark grayish brown silty clay loam

Subsoil:

7 to 11 inches, brown silty clay loam with common mottles

11 to 19 inches, grayish brown silty clay with common mottles

19 to 22 inches, gray silty clay and silt loam with common mottles

Substratum:

22 to 25 inches, yellowish brown cobbly loam with many mottles

25 to 38 inches, brown gravelly loam with common mottles

38 to 72 inches, light olive brown gravelly fine sandy loam with common mottles

Included with this soil in mapping are about 5 percent Malone and Hogansburg soils in areas having subsoil with more gravel and on somewhat higher positions. About 5 percent of this unit is poorly drained Adjidaumo soils in depressions and along drainageways. Small areas of soils similar to Hailesboro, Roundabout, and Mino soils are included where there is less clay in the subsoil. Some areas of this unit have a shorter growing season than is typical of Churchville soils. In some areas, the surface texture is silty clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the mineral surface, and slow in the subsoil and substratum

Available water capacity (average for 40-inch profile): moderate to high

Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May

Root zone: mainly to 18 inches deep

Shrink-swell potential: moderate in the subsoil

Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hay or pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest operations in the fall. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yield. Because of moderately slow permeability in the surface layer, the potential for pesticide and nutrient loss from runoff on this soil is high. Conservation tillage systems, crop rotation and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage, and yearly mowing are good management practices.

The potential productivity for growing sugar maple on this soil is moderate. Because of the seasonal high water table, heavy harvesting equipment may bog down in the spring and cause deep ruts. Also, windthrow may be a severe management problem particularly in poorly drained spots where tree roots are restricted by seasonal wetness.

The seasonal high water table is the main limitation if this soil is used as a site for dwellings. A better suited site should be considered such as on a higher inclusion within the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water flowing from higher areas by carrying it away from the dwelling.

The main limitations if this soil is used for local roads and streets are frost action and low soil strength. Plans for new road construction should call for providing coarse grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action.

The main limitations if this soil is used for septic tank absorption fields are the seasonal high water table and the slow permeability. A better suited site should be considered for this use. Higher spots within the map unit will likely be better sites. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

39B—Churchville silty clay loam, 3 to 8 percent slopes

This soil is very deep, gently sloping and somewhat poorly drained. It occurs on toeslopes, and on undulating areas of glacial till plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, very dark grayish brown silty clay loam

Subsoil:
7 to 11 inches, brown silty clay loam with common mottles
11 to 19 inches, grayish brown silty clay with common mottles
19 to 22 inches, gray silty clay and silt loam with common mottles

Substratum:
22 to 25 inches, yellowish brown cobbly loam with many mottles
25 to 38 inches, brown gravelly loam with common mottles
38 to 72 inches, light olive brown gravelly fine sandy loam with common mottles

Included with this soil in mapping are about 5 percent Malone and Hogansburg soils in areas having subsoil with more gravel and on somewhat more convex positions. About 5 percent of this unit is poorly drained Adjidaumo soils in depressions and along drainageways. Small areas of soil similar to Hailesboro, Roundabout, and Mino soils are included where there is less clay. Some areas of this unit have a shorter growing season than is typical of Churchville soils. In some areas, the surface texture is silty clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the mineral surface, and slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): moderate to high
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: moderate in the subsoil
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay or pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest operations in the fall. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yield. Soil erosion may become a management problem on long slopes left unprotected by vegetative cover. Because of slope and moderately slow permeability in the surface layer, the potential for pesticide and nutrient loss from runoff on this soil is high. Conservation tillage systems, crop rotation and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage, and yearly mowing are good management practices.

The potential productivity for growing sugar maple on this soil is moderate. Because of the seasonal high water table, heavy harvesting equipment may bog down in the spring resulting in deep ruts. Windthrow can also be a severe management problem particularly in poorly drained spots where tree roots are restricted by seasonal wetness.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as on a higher area within the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitations if this soil is used as a site for local roads and streets are frost action and low soil strength. Construction plans should call for providing coarse grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow permeability. A better suited site should be considered for this use. Higher spots within the map unit will likely be better sites. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

40B—Heuvelton silty clay loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and moderately well drained. It is on slightly convex areas and low ridges of lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

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

Subsoil:
6 to 10 inches, brown silty clay loam
10 to 18 inches, brown silty clay
18 to 22 inches, brown silty clay with common mottles
22 to 32 inches, grayish brown silty clay with many mottles
32 to 39 inches, dark grayish brown clay with many mottles

Substratum:
39 to 72 inches, dark gray clay with few mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Muskellunge soils in nearly level areas and slightly concave areas. About 5 percent of this unit are poorly drained Adjidaumo soils and soils similar to Hogansburg soils with a higher clay content. Adjidaumo soils are in depressions and near drainageways. Some areas of this unit are well drained, or have bedrock less than 60 inches deep. Also, in some areas, the surface texture is silt loam or clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate or moderately slow in the surface and subsoil, and slow or very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 18 to 24 inches deep at some time from November through April
Root zone: mainly to 24 inches deep
Shrink-swell potential: moderate
Depth to bedrock: more than 60 inches

Most areas of this soil are used for hay. This soil meets the requirements of prime farmland.

This soil is well suited to growing cultivated crops and hay. Erosion can significantly reduce soil productivity especially on long slopes planted to row crops. Care should be taken by cultivating with the contour of the land. Residue management through conservation tillage systems, crop rotation, and the use of cover crops are good management practices.

This soil is well suited to pasture. Erosion can be a management problem particularly on long slopes subject to heavy grazing. Overgrazing should be avoided. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing northern red oak on this soil is moderately high. There are no major management limitations on this soil.

The main limitation if this soil is used as a site for dwellings with basements is the seasonal high water table. Foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water from higher elevations by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is the low soil strength and potential frost action. Good road design accounts for special construction techniques to provide adequate support for pavement and traffic. Coarse grained subgrade material will diminish frost action if adequate drainage is installed.

The main limitations of this soil for septic tank absorption fields are the seasonal high water table and very slow permeability. A better suited site should be considered for this use. Well drained inclusions within this unit will likely perform better. Conventional septic system designs may perform poorly on this soil. Alternative designs that augment the filtering capacity of this soil should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness, unless mechanical support or other precautions are taken.

The capability subclass is 2e.

40C—Heuvelton silty clay loam, 8 to 15 percent slopes

This soil is very deep, strongly sloping, and moderately well drained. It is on convex areas, stream side slopes, and low ridges of lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

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

Subsoil:
6 to 10 inches, brown silty clay loam
10 to 18 inches, brown silty clay
18 to 22 inches, brown silty clay with common mottles
22 to 32 inches, grayish brown silty clay with many mottles
32 to 39 inches, dark grayish brown clay with many mottles

Substratum:
39 to 72 inches, dark gray clay with few mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Muskellunge and Hailesboro soils on gently sloping and slightly concave areas. About 5 percent of this unit includes soils similar to Hogansburg and Nicholville soils having less clay in the profile. Adjidaumo soils are included in depressions and toeslopes near drainageways. Some areas of this unit are well drained, or have bedrock less than 60 inches deep. Also, in some areas, the surface texture is silt loam or clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate or moderately slow in the surface and subsoil, and slow or very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 18 to 24 inches deep at some time from November through April
Root zone: mainly to 24 inches deep
Shrink-swell potential: moderate
Depth to bedrock: more than 60 inches

Most areas of this soil are used for hay or pasture.

This soil is moderately well suited to growing cultivated crops and hay. Erosion can significantly reduce soil productivity on areas planted to row crops unless adequate conservation practices like stripcropping are used to control water runoff. All cultivating should follow the contour of the land where possible to avoid gully erosion. Conservation tillage systems, crop rotation, and the use of cover crops are good management practices.

This soil is moderately well suited to pasture. Erosion can be a significant problem on heavily grazed slopes. Overgrazing should be avoided. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing northern red oak on this soil is moderately high. There are no major management limitations on this soil. However, soil erosion can be a moderate concern on improperly maintained skid roads and landing sites.

The main limitation if this soil is used as a site for dwellings with basements is the seasonal high water table. Foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can help carry away surface water originating from higher elevations.

The main limitations if this soil is used as a site for local roads and streets are low soil strength and potential frost action. Good road design will call for adequate support for pavement and traffic. Coarse grained subgrade material will diminish frost action if adequate drainage is installed.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and very slow permeability. A better suited site should be considered for this use. Well drained inclusions within this unit will likely perform better. Conventional septic system designs will generally perform poorly on this soil. Alternative designs that augment the filtering capacity of this soil should be considered.

The main limitation if this soil is used as site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness, unless mechanical support or other precautions are taken.

The capability subclass is 3e.

41A—Muskellunge silty clay loam, 0 to 3 percent slopes

This soil is very deep, nearly level and somewhat poorly drained. It occurs on swales and smooth areas on glacial lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, dark brown silty clay loam

Subsoil:
9 to 16 inches, dark grayish brown silty clay with many mottles
16 to 38 inches, brown silty clay with common mottles

Substratum:
38 to 45 inches, brown silty clay with many mottles
45 to 72 inches, dark yellowish brown clay with common mottles

Included with this soil in mapping are about 5 percent moderately well drained Heuvelton soils on slightly convex positions, and on areas adjacent to dissected streams. About 5 percent of this unit is poorly drained Adjidaumo soils in slight depressions and along drainageways. Small areas of somewhat poorly drained Hailesboro, Roundabout, and Mino soils are included where there is less clay. Also small areas of somewhat poorly drained Swanton soils are included where the surface and subsoil are loamier. In some areas, the surface texture is silty clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow in the surface layer and slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: moderate
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest operations in the fall. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yield. Because of moderately slow permeability in the surface layer, the potential for pesticide and nutrient loss from runoff on this soil is high. Conservation tillage systems, crop rotation, and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture, especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage and yearly mowing are good management practices.

The potential productivity for growing sugar maple on this soil is moderate. Because of the seasonal high water table, heavy harvesting equipment can bog down in the spring and cause deep ruts. Dry soil conditions or frozen periods should be used for operating equipment on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as on a higher inclusion within the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water flowing from higher areas by carrying it away from the dwelling.

The main limitations if this soil is used as site for local roads and streets are frost action and low soil strength. Plans for new road construction should call for providing coarse grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action.

The main limitations if this soil is used as site for septic tank absorption fields are the seasonal high water table and the slow permeability. A better suited site such as higher spots within the map unit, should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

41B—Muskellunge silty clay loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and somewhat poorly drained. It occurs on toeslopes, and on slightly dissected or undulating areas of glacial lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, dark brown silty clay loam

Subsoil:
9 to 16 inches, dark grayish brown silty clay with many mottles
16 to 38 inches, brown silty clay with common mottles

Substratum:
38 to 45 inches, brown silty clay with many mottles
45 to 72 inches, dark yellowish brown clay with common mottles

Included with this soil in mapping are about 5 percent moderately well drained Heuvelton soils on knolls and slightly convex positions. About 5 percent of this unit includes poorly drained Adjidaumo soils in slight depressions and along drainageways. Small areas of somewhat poorly drained Hailesboro, Roundabout and Mino soils are included where there is less clay. Also small areas of somewhat poorly drained Swanton soils are included where the surface and subsoil are loamier. In some areas, the surface texture is silty clay. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow in the surface layer and slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: moderate
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay or pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest operations in the fall. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yields. Soil erosion may become a management problem on long slopes left unprotected by vegetative cover. Because of moderately slow permeability and slope, the potential for pesticide and nutrient loss from runoff on this soil is high. Conservation tillage systems, crop rotation, and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture, especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage, and yearly mowing are good management practices.

The potential productivity for growing sugar maple on this soil is moderate. Because of the seasonal high water table, heavy harvesting equipment may bog down in the spring resulting in deep ruts. Operating equipment on this soil should be limited to periods when the soil is dry or frozen.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as on a higher area within the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitations if this soil is used as a site for local roads and streets are frost action and low soil strength. Construction plans should call for providing coarse grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow permeability. A better suited site, such as a higher spot on the map unit, should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

42—Adjidaumo silty clay

This soil is very deep, nearly level and poorly drained. It occurs on slightly depressional areas of glacial lake plains. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, black silty clay

Subsoil:
7 to 10 inches, dark gray silty clay
10 to 36 inches, dark gray silty clay

Substratum:
36 to 72 inches, grayish brown silty clay

Included with this soil in mapping are about 10 percent very poorly drained Adjidaumo soils near ponded areas and along drainageways. About 5 percent of this unit is somewhat poorly drained Muskellunge soils on slightly higher landscape positions. Small areas of very poorly drained Pinconning soils and somewhat poorly drained Swanton soils are included where sandy or loamy deposits occur over the clayey substratum. Also included are small areas of soils with less silt and sand in the subsoil. In some areas, the surface texture is clay or silty clay loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow in the surface, slow in the subsoil, and slow or very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: at the surface to 6 inches below the surface at some time from November through June
Root zone: generally to 10 inches deep
Shrink-swell potential: moderate
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for woodland or brush.

This soil is poorly suited to growing cultivated crops and hay because of the seasonal high water table. The surface is saturated during the early growing season. Drainage systems may be expensive to install and maintain because their outlets can be difficult to establish without draining fragile wetland.

This soil is poorly suited to pasture. The seasonal high water table is near the surface during spring and early summer. Areas of this soil may not support typical pasture plant species because of wetness. Ground conditions are generally soft and susceptible to compaction from livestock. Drier areas should be considered for this use. Deferred grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, ground conditions are very soft in late fall and spring. These conditions limit the efficient use of harvesting equipment to mainly summer or winter. Since root growth is restricted by the seasonal high water table, seedling mortality and windthrow will likely be severe for areas of this unit unless wetness-tolerant species are managed.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher position within this map unit.

The main limitations if this soil is used as a site for local roads and streets are low soil strength, frost action, and the seasonal high water table. Design of roads can integrate special techniques to provide adequate road surface support such as, designing a subgrade having an adequate thickness of coarse grain material. Adequate drainage can also be installed to lower the water table and lessen frost heave potential.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow permeability. A better suited site such as a nearby higher position on the landscape should be considered for these uses.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless significant drainage is installed. Sloughing of soil may occur because of wetness.

The capability subclass is 4w.

43—Adjidaumo mucky silty clay

This soil is very deep, nearly level and very poorly drained. It occurs in basin-like areas on glacial lake plains. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, black mucky silty clay

Subsoil:
7 to 10 inches, dark gray silty clay
10 to 36 inches, dark gray silty clay

Substratum:
36 to 72 inches, grayish brown silty clay

Included with this soil in mapping are about 5 percent poorly drained Adjidaumo soils along the perimeter of basin-like positions. About 5 percent of this unit is somewhat poorly drained Muskellunge soils on higher positions. Small areas of very poorly drained Pinconning soils are included where sandy deposits occur over the clayey substratum. Also included are small areas of very poorly drained Wonsqueak or Dorval soils where thicker organic surface deposits occur. There are also small areas of soils with less silt and sand in the subsoil. In some areas, the surface texture is mucky clay or mucky silty clay loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow in the surface, slow in the subsoil, and slow or very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 inches above the surface to 6 inches below the surface from November through June
Root zone: generally up to 10 inches deep
Shrink-swell potential: moderate
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland or brush.

This soil is poorly suited to growing cultivated crops and hay because of the seasonal high water table. Drainage systems may be expensive to install and maintain because their outlets can be very difficult to establish without draining fragile wetland.

This soil is poorly suited to pasture. The seasonal high water table is near the surface or covers the surface during the early growing season. Areas of this soil will not support most typical forage species. Ground conditions are generally soft and susceptible to compaction from livestock. Drier areas should be considered for this use.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, ground conditions are very soft, particularly during late fall and spring. These conditions limit the efficient use of harvesting equipment mainly to summer or winter. Since root growth is restricted by the seasonal high water table, seedling mortality and windthrow will likely be severe on this unit unless wetness-tolerant species are managed.

The main limitation if this soil is used as a site for dwellings is ponding or the existence of a seasonal high water table. A better suited site should be considered such as a higher position near this map unit.

The main limitations if this soil is used as a site for local roads and streets are low soil strength, frost action, and ponding. Road designs can integrate special techniques to provide adequate road surface support such as, designing a subgrade having an adequate thickness of coarse grain material. Additional drainage may be necessary to lower the water table and lessen frost heave potential.

The main limitations if this soil is used as a site for septic tank absorption fields are ponding and slow permeability. A better suited site should be considered for this use.

The main limitation if this soil is used as a site for shallow excavations is ponding. Digging operations will be restricted to dry periods of the year unless significant drainage is installed. Sloughing of soil may occur because of wetness.

The capability subclass is 5w.

44—Mino loam

This soil is very deep, nearly level, and somewhat poorly drained. It is in slightly concave areas on lake plains. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown loam

Subsoil:
9 to 12 inches, brown very fine sandy loam with common mottles
12 to 16 inches, pale brown loamy very fine sand with many mottles
16 to 24 inches, brown very fine sandy loam with many mottles

Substratum:
24 to 37 inches, light gray very fine sandy loam with many mottles
37 to 78 inches, gray very fine sandy loam with common mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Roundabout, Hailesboro, and Muskellunge soils in scattered areas where there are less sand and more silt or clay. About 5 percent of this map unit consists of soils similar to Sciota in deep sands from glacial lake beach deposits.

Also included are about 5 percent somewhat poorly drained Swanton soils and moderately well drained Flackville soils where clay occurs within 40 inches. Small areas of very poorly drained Pinconning soils are in depressions. In some areas, the surface texture is sandy loam or very fine sandy loam. Included areas make up about 20 percent of this map unit and range up to 5 acres each.

Soil Properties

Permeability: moderate throughout
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 20 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay. A few areas are in pasture or woodland. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest operations in the fall. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yield. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table may limit the growth of forage plants in the spring. Excessive grazing during wet periods increases compaction of the surface layer and subsequent loss of desired plant species. Rotational grazing, deferred grazing, proper stocking rates, maintenance of drainageways, and yearly mowing are good management practices.

The potential productivity for growing white ash on this soil is moderate. Heavy equipment may bog down and cause deep ruts during wet periods. Wood harvest during winter or summer months may work best. Rooting depth is moderately limited by the seasonal high water table which may restrict seedling survival. Shallow root systems within this soil are commonly subject to moderate windthrow. Selecting species that are tolerant of wet soil conditions will help increase seedling survival and reduce windthrow.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. Foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also help control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Constructing roads on a raised bed of coarser grained material and providing adequate drainage will decrease the potential damage from frost action and wetness.

The main limitation if this soil is used as a site for septic tank absorption fields is the seasonal high water table. A more convex area may be better suited as a site for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be limited to the drier periods of the year unless drainage is installed.

The capability subclass is 3w.

45—Sciota fine sand

This soil is very deep, nearly level, and somewhat poorly drained. It is on smooth plains and on toeslopes of narrow ridges. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown fine sand

Subsoil:
9 to 19 inches, pale brown and light olive brown fine sand with common mottles
19 to 24 inches, pale brown and light yellowish brown fine sand with many mottles
24 to 37 inches, light brownish gray and pale brown fine sand with common mottles

Substratum:
37 to 50 inches, dark grayish brown loamy fine sand with common mottles
50 to 57 inches, dark gray fine sand with few organic stains
57 to 72 inches, dark gray sand

Included with this soil in mapping are about 5 percent moderately well drained Croghan soils on slightly convex areas of the unit. About 5 percent of this unit consists of poorly drained Deinache soils along drainageways and in depressions. About 5 percent of this unit includes Wainola soils having a more reddish brown subsoil. Also included are small areas of Swanton and Pinconning soils having a clay substratum within 40 inches deep. Small areas of Occur and Coveytown soils are included where loamy till substrata are within 40 inches of the surface. In some areas, the surface texture is fine sandy loam or loamy fine sand. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid throughout
Available water capacity (average for 40-inch profile): low to moderate
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hayland. Some undrained areas are in brush or pasture.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage will help to improve farm operation efficiency and increase crop yield. Conservation tillage systems, crop rotation, and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture especially in the spring. Forage growth may be stunted during the early growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, heavy equipment may bog down under soft ground conditions in the spring. Harvesting in the summer or during frozen ground conditions will increase equipment efficiency. Seedling mortality and windthrow are also moderate management problems because of root growth limited by wetness and low available water capacity in some areas of this unit.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered on a higher area within the map unit or nearby. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

A moderate limitation if this soil is used as a site for local roads and streets is the seasonal high water table. Roads constructed on coarse grained fill material with adequate drainage will generally be more durable.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the soil's sandy texture being a potentially poor filter. A better suited site should be considered for this use. If this soil is used, higher spots within the map unit will likely perform better. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered. Because of the rapid permeability of the soil, there is a possibility of ground water contamination.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and the risk of the soil caving in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness. Trench walls should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 3w.

46—Deinache fine sand

This soil is very deep, nearly level, and poorly drained. It occurs in basin-like areas on sandy lake plains. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark brown fine sand

Substratum:
9 to 19 inches, grayish brown fine sand with common mottles
19 to 35 inches, light brownish gray fine sand with common mottles
35 to 44 inches, dark gray loamy fine sand with few mottles
44 to 48 inches, very dark gray loamy very fine sand with few mottles
48 to 64 inches, dark gray very fine sandy loam
64 to 72 inches, dark gray silt loam

Included with this soil in mapping are about 5 percent very poorly drained Pinconning soils in areas having clayey substrata. About 5 percent of this unit includes somewhat poorly drained Sciota and Wainola soils on slightly higher positions. In some landscape depressions, very poorly drained Markey and

Wonsqueak soils are included where thicker organic deposits have accumulated. Also included are soils similar to Deinache, but very poorly drained, and sandy soils with loamy substrata similar to Cook and Coveytown soils. In some areas, the surface texture is loamy fine sand or fine sandy loam. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the solum and upper substratum, and moderate or moderately rapid in the lower substratum
Available water capacity (average for 40-inch profile): low to moderate
Depth to seasonal high water table: at the surface to 12 inches deep at some time during November through May
Root zone: dominantly in the upper 12 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for brush or woodland. Some areas are being used for hay.

This soil is poorly suited to growing cultivated crops and hay because of the seasonal high water table. The surface is saturated by water during the early part of the growing season. Drainage can be expensive to install and maintain, since this soil typically occupies one of the lowest positions on the landscape. Outlets may be very difficult to establish without draining important wetland. Applying conservation tillage systems, using cover crops, and maintaining existing drainageways are good practices on this soil.

This soil is poorly suited to pasture. The seasonal high water table is near the surface during part of the grazing season. Drier areas should be considered for this use. Very poorly drained inclusions will not support good forage for livestock. Ground conditions are typically too soft for livestock traffic during the spring and may cause serious erosion. Deferred grazing, rotational grazing, and proper stocking rates are good management practices on this soil.

The potential productivity for red maple on this soil is moderate. Saturated soil conditions in the spring cause soft ground for heavy equipment on this soil. Harvesting operations would be more efficient in the summer or during frozen ground conditions. Because of the seasonal high water table, seedling mortality is severe for most hardwood species. Windthrow hazard is also severe because of restricted root growth. Species tolerant to wet soil should be considered for woodland management. Thinning should be kept to a minimum to reduce windthrow.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area on the landscape. If this soil is used, foundation drains and other forms of subsurface drainage, as well as protective coatings on basement walls will be needed to control wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is the seasonal high water table. Roads should be constructed on raised coarse grained fill material and adequate drainage systems installed. Construction costs may be significantly less if new roads are routed around this soil.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, and the soil's poor ability to filter effluent properly. A better suited site should be considered for this use. Higher spots within the map unit may perform better for this use. Conventional septic system designs will perform poorly on this soil. Because of rapid permeability, there is significant risk of ground water contamination.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and the soil's tendency to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area will also occur because of wetness. The excavation trench should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 4w undrained, 3w drained.

47B—Elmwood fine sandy loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and moderately well drained. It is on marine or lake plains where glacial streams, rivers, or wind deposited mantles of fine sand and silt over lacustrine or marine clayey materials.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 6 inches, brown fine sandy loam

Subsoil:
6 to 9 inches, brown to dark brown fine sandy loam
9 to 17 inches, yellowish brown fine sandy loam
17 to 22 inches, brown fine sandy loam with common mottles
22 to 25 inches, yellowish brown fine sandy loam with few mottles

Substratum:
25 to 72 inches, dark brown silty clay with common mottles

Included with this soil in mapping are about 10 percent somewhat poorly drained Swanton soils in slightly concave or seep areas. About 5 percent of this unit includes moderately well drained Heuvelton soils where the loamy mantle over the clay is very thin or non-existent. Flackville soils are included where the overlying mantle is sandier than in Elmwood soils. Mino soils are included where the underlying clayey substratum is deeper than 40 inches. In some places, the stony, loamy Hogansburg soils are on small slightly higher areas. These included areas range up to 5 acres and make up about 20 percent of this unit.

Soil Properties

Permeability: moderately rapid in the surface and subsoil, and very slow or slow in the clayey substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 18 to 36 inches deep from November through May
Root zone: generally down to the clayey substratum
Shrink-swell potential: low in the surface and subsoil, and moderate in the substratum
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hayland or pasture. This soil meets the criteria for prime farmland.

This soil is well suited for cultivated crops and hay. The soil is easily tilled when moist. Some seasonal wetness during early spring and late fall may hinder planting and harvesting operations, particularly in included wetter areas. Subsurface drainage can help alleviate wetness problems. On longer slopes erosion can be a soil management concern. Conservation measures such as stripcropping, conservation tillage and the use of crop rotations that emphasize sod crops can reduce soil loss.

This soil is well suited to pasture. The seasonal high water table and clayey substratum may restrict the root growth of some legumes. Grazing when the soil is wet will compact the surface and may lead to loss of pasture seeding. Overgrazing reduces the quantity and quality of forage. Deferred and rotational grazing, proper stocking rates, harvesting at the proper stage of plant growth, and weed and brush control are practices that help to increase the quantity and quality of forage.

The potential productivity for eastern white pine on this soil is high. The seasonal high water table and the clayey substratum may cause a moderate windthrow hazard by restricting root growth in areas of this unit. By keeping thinning to a minimum, the woodland manager can reduce the chance of windthrow. Seedlings survive and grow well if competing vegetation is controlled.

The seasonal high water table is the main limitation if this soil is used as a site for dwellings with basements. Installing foundation drains and applying protective coatings on basement walls will help prevent wet basements.

Potential frost action and low soil strength are the main limitations if this soil is used as a site for local roads and streets. Providing coarser grained subgrade material to frost depth will help prevent damage due to frost action. Providing suitable subgrade materials or using special construction methods for adequate support are ways to compensate for the low soil strength of this map unit.

Slow permeability in the substratum and the seasonal high water table are the main limitations if this soil is used as a site for septic tank absorption fields. Specially designed septic systems are sometimes needed to overcome these limitations. Enlarging the absorption field may compensate for the slow permeability. Installing a drainage system around the filter field will help overcome wetness problems.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be delayed in the early spring because of wetness. Sloughing of trench walls may occur because of wetness and necessitate mechanical support to prevent the soil from caving in.

The capability subclass is 2w.

48—Swanton very fine sandy loam

This soil is very deep, nearly level, and somewhat poorly drained. It is on broad lake plains in the lowlands and on slight upland depressions. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown very fine sandy loam

Subsoil:
9 to 17 inches, brown fine sandy loam with many mottles
17 to 24 inches, brown fine sandy loam with common mottles
24 to 31 inches, grayish brown fine sandy loam with many mottles

Substratum:
31 to 50 inches, grayish brown silty clay with many mottles
50 to 72 inches, dark gray clay with few mottles

Included with this soil in mapping are about 5 percent Hailesboro and Muskellunge soils occupying similar positions in the landscape but lacking a loamy mantle. About 5 percent of this map unit includes moderately well drained Flackville soils on slightly convex areas. Also included are about 5 percent very poorly drained Pinconning soils near drainageways and ponded areas. Small areas of Roundabout and Mino soils are included where loamy deposits are greater than 40 inches deep. Included in this unit are similar soils having sand and loamy sand surface or subsoil layers. Some areas of this soil have a loam or fine sandy loam surface. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately rapid in the surface and subsoil, and slow or very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: perched 12 to 18 inches deep at some time from November through May
Root zone: mainly to 20 inches deep
Shrink-swell potential: low in the surface and subsoil, and moderate in the substratum
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay. Some areas are in woodland or pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage can significantly increase crop production and improve farm operation efficiency. Because of its nearly level topography, this soil may be difficult to drain without adversely affecting important wetland nearby. Conservation tillage systems, crop rotation, and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. In heavily traveled areas of the pasture, the seasonal high water table can lead to muddy conditions, soil compaction, and loss of forage plants. Forage growth may be stunted during the early growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, maintenance of existing drainageways, and yearly mowing are good management practices.

The potential productivity for growing eastern white pine on this soil is very high. The seasonal high water table and depth to the clayey substratum are the major limitations. Wet soil conditions can increase seedling mortality and restrict the use of heavy equipment. Root growth may be limited by both the seasonal high water table and the clayey substratum. Therefore, some trees may be uprooted during windy periods. Minimal thinning of standing timber helps to reduce potential windthrow. Harvesting during the summer or during frozen ground conditions can alleviate equipment limitations. Species that are tolerant to wet soil conditions should be considered. Seedlings tend to survive best if competing vegetation is controlled.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited soil on a higher part of the landscape should be considered for this use. If this soil is used, foundation drains and protective coatings on basement walls will alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Constructing on raised beds of coarse grained subgrade material will help reduce potential damage from frost action. Adequate drainage in critical areas will also decrease frost action as well as wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow percolation rate in the clayey substratum. A better suited soil on a higher position of the landscape should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to drier periods of the year unless drainage is installed. Sloughing of trench walls may also occur because of wetness.

The capability subclass is 3w.

49—Munuscong mucky fine sandy loam

This map unit consists of very deep, nearly level, very poorly drained soils formed in a loamy mantle over clayey sediments. It is on low positions within lake or marine plains and in uplands. Slopes are smooth and range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, black mucky fine sandy loam

Subsoil:
8 to 22 inches, light gray fine sandy loam
22 to 26 inches, grayish brown fine sandy loam

Substratum:
26 to 38 inches, grayish brown silty clay
38 to 48 inches, gray silty clay loam
48 to 98 inches, dark gray silty clay

Included with this unit in mapping are 10 percent somewhat poorly drained Swanton soils on low hummocks. About 5 percent of this unit are small areas of somewhat poorly drained Mino soils on slightly more convex places lacking a clayey substratum. Moderately well drained Elmwood soils are included on slightly convex areas of the map unit. Also included are small knolls having loamy Hogansburg soils. Included in some places are small areas of Deinache and Pinconning soils having sand in the subsoil. Also included are small areas of Adjidaumo soils that have more clay in the surface and subsoil. The included areas make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderately rapid in the surface layer and subsoil, and slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 inches above the surface to a depth of 12 inches between November and May
Root zone: mainly in the upper 12 inches
Shrink-swell potential: low in the surface and subsoil, and moderate in the substratum
Depth to bedrock: greater than 60 inches

Most areas of this unit are wooded. Some areas that were cleared of trees are now idle and reverting to brush.

This unit is poorly suited to cultivated crops and hay because of wetness. The seasonal high water table delays planting in the spring and interferes with harvesting in the fall. This soil is difficult to drain adequately for most crops grown in the region. The low topographical position of this soil adds to the difficulty of constructing an adequate drainage outlet. Drainage of this soil may adversely affect important wetland areas.

This soil is poorly suited to pasture. The seasonal high water table is the main problem restricting the rooting depth of most grasses. In addition, pasturing animals on this soil under typical wet conditions causes compaction of the subsoil, loss of tilth in the surface soil, and damage to forage because of the punching effect of the animal's hooves. Draining the soil with open ditches or tile and selecting shallow-rooted grasses tolerant of wetter soil conditions will improve productivity. However, drainage may adversely affect important wetland areas. Restricting grazing during wet periods, applying proper stocking rates, and yearly mowing will enhance the quality and quantity of feed and forage.

The potential productivity for quaking aspen on this soil is moderate. Wet soil conditions depress growth rates and limit the number of adaptable species. Wetness also hinders heavy equipment use in the spring and during other wet periods. Logging during drier periods or in winter, when the ground is frozen, will help overcome this limitation. The rate of seedling mortality can be excessive because of wetness. Seedling mortality may be decreased by timely planting when the soil is moist, but not wet, and by the selection of adaptable species. There is a severe windthrow hazard because the water table limits the development of an anchoring root system. By keeping thinning to a minimum, and planting shallow rooted species, the manager can minimize windthrow.

Ponding and the seasonal high water table severely restrict the use of this unit as a site for dwellings with basements. One strategy to overcome this limitation is to site the building on included better drained soils. Elwood and Hogansburg soils are examples of a better suited soil for this use.

The seasonal high water table, potential frost action, and low soil strength are the main limitations if this unit is used as a site for local roads and streets. Constructing on raised fill material and installing adequate culverts and roadside drainage ditches are means of overcoming the wetness limitation. Providing coarser grained subgrade material to frost depth will help prevent damage due to frost action. Providing suitable base and subgrade material can also compensate for the low strength of this soil.

The seasonal high water table and the slow permeability in the clayey substratum are severe limitations if this soil is used as a site for septic tank absorption fields. Conventional septic systems will not function properly in most areas of this map unit. A better site should be considered for this use.

The main limitations if this soil is used as a site for shallow excavations are ponding and the tendency for cutbanks to cave in. Wetness will delay most digging operations to drier periods of the year unless adequate drainage is installed. Because of wetness, trench walls tend to lack stability and may need mechanical support to prevent caving in on workers or other potential victims.

The capability subclass is 5w (undrained).

50—Hailesboro silt loam

This soil is very deep, nearly level, and somewhat poorly drained. It occurs on broad glacial lake plains and slightly concave areas on upland glacial till plains. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, dark brown silt loam

Subsoil:
9 to 15 inches, brown silt loam with few mottles
15 to 30 inches, dark grayish brown silty clay loam with common mottles

Substratum:
30 to 38 inches, gray silt loam with common mottles
38 to 72 inches, dark grayish brown silty clay loam

Included with this soil in mapping are about 5 percent somewhat poorly drained Muskellunge and Swanton soils. The Muskellunge soils contain more clay, and Swanton soils have a loamy surface and subsoil overlying a clayey substratum. About 5 percent of this unit includes poorly drained Adjidaumo soils in basin-like areas. Small areas of this unit contain somewhat poorly drained Roundabout and Mino soils. Roundabout soils are included in areas with less clay, and Mino soils contain more sand. In some areas the surface texture is very fine sandy loam. Inclusions make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderate in the surface, and moderately slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 to 18 inches deep at some time during October through June
Root zone: dominantly to 20 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in pasture and hayland. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring. Surface and subsurface drainage will help to improve the efficiency of farm operations and increase crop yield. Conservation tillage systems, crop rotation and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in heavily traveled areas of the pasture especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Deferred grazing, rotational grazing, proper stocking rates, and yearly mowing are good management practices.

The potential productivity for growing white ash on this soil is high. Because of the seasonal high water table, soil wetness during spring will cause soft ground conditions for heavy equipment. Also, wetness is a limiting factor in root growth for some species and may cause severe windthrow. Harvesting during the summer or during frozen ground conditions can increase efficient use of equipment. Managing wetness-tolerant species and minimizing thinning are good management practices.

The main limitation if this soil is used as site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area nearby. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Construction designs can specify providing coarse grained subgrade material to minimize frost action. Adequate drainage in critical areas will also decrease the potential for frost action as well as diminish wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and its moderately slow permeability in the substratum. A better suited site should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

51—Wegatchie silt loam

This map unit consists of very deep, nearly level, poorly drained soils that formed in clayey sediments. It is in low-lying basins or along streams. Slopes are smooth and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 8 inches, very dark gray silt loam

Subsoil:
8 to 13 inches, gray clay loam
13 to 19 inches, dark gray silty clay loam
19 to 40 inches, dark gray silt loam

Substratum:
40 to 72 inches, yellowish brown silt loam

Included with this map unit are about 10 percent soils similar to Dorval muck in depressions where organic matter accumulates on the surface. Moderately well drained Heuvelton soils are included on slightly convex areas. The similar somewhat poorly drained Hailesboro soils and the loamy over clayey Swanton soils are included on slightly higher places within the map unit. In places, small areas of finer-textured Adjidaumo soils are included. Also included are small areas of loamy Grenville, Hogansburg, and Malone soils on small knolls. Included areas make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderate in the surface and moderately slow in the subsoil and substatum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 0 to 12 inches between November and June
Rooting zone: mainly in the upper 12 inches
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Much of this unit is wooded. Some areas that were cleared are now idle and reverting to brush.

This unit is poorly suited to growing cultivated crops and hay because of seasonal wetness. Artificial drainage is difficult to establish in places because of a lack of suitable outlets. Conservation tillage, crop residue on and in the soil, and cover crops improve tilth.

This soil is poorly suited to pasture. The seasonal high water table restricts the rooting depth of some plants, especially legumes. Grazing the soil when wet results in soil compaction and loss of tilth. Artificial drainage and the selection of shallow-rooted, water tolerant plant varieties will improve productivity. Restricting grazing during wet periods, proper stocking rates, and yearly mowing are practices that will limit compaction, preserve tilth and enhance the quality and quantity of feed and forage.

The potential productivity for red maple on this soil is moderate. Wet soil conditions can hinder heavy equipment use, especially in the spring and other wet periods. Logging during drier periods or in winter when the ground is frozen will help overcome this limitation. Planting seedlings when the soil is moist, but not wet, will optimize the rate of seedling survival. Because the seasonal high water table limits development of an anchoring root system, there is a severe windthrow hazard. Keeping thinning to a minimum and planting shallow-rooted varieties are ways to reduce windthrow.

Seasonal wetness is the main limitation if this unit is used as a site for dwellings with basements. The best alternative is to place dwellings on included or nearby soils that are on higher landscape positions. Heuvelton and Hogansburg soils are more suitable as a site for buildings.

The seasonal high water table, low soil strength, and potential frost action are the main limitations if this unit is used as a site for local roads and streets. Constructing on raised fill material and installing a drainage system are means of overcoming the wetness limitation. Providing coarser grained subgrade material to frost depth will help support the surface and prevent frost damage.

The seasonal high water table and slow permeability are severe limitations for septic tank absorption fields. Conventional septic systems will perform poorly in these soils. Special designs to improve the site's filtering capacity as well as controlling the seasonal wetness are necessary in this area. The best alternative is to select a site with more favorable conditions such as Grenville soils.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the driest part of the year unless significant drainage is installed. Sloughing of soil in the excavated area may also occur because of wet trench walls.

The capability subclass is 4w.

53B—Nicholville very fine sandy loam, 3 to 8 percent slopes

This soil is very deep, gently sloping and moderately well drained. It occurs on smooth, slightly convex areas of glacial lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown very fine sandy loam

Subsoil:
9 to 12 inches, dark brown very fine sandy loam
12 to 20 inches, brown very fine sandy loam with few mottles

Substratum:
20 to 30 inches, brown loamy very fine sand with common mottles
30 to 34 inches, dark brown loamy fine sand with few mottles
34 to 72 inches, grayish brown, loamy very fine sand with many mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Roundabout soils on footslopes, concave areas, and near drainageways. About 5 percent of this unit includes moderately well drained Hogansburg soils having loamy material with rock fragments in areas near glacial till landscapes. Small areas of somewhat poorly drained Wainola and Hailesboro soils are in concave areas and near drainageways. Small areas of nearly level and strongly sloping topography are included. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate throughout
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 18 to 24 inches deep at some time from November through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hayland.

This soil is well suited to growing cultivated crops and hay. Erosion can be a serious management problem on long slopes causing lower crop yields. Care should be taken when cultivating by working along the contour of the landscape. Conservation tillage systems, crop rotation, contour farming, and the use of cover crops are good management practices.

This soil is well suited to pasture. Erosion can be a management problem particularly on long slopes subject to heavy grazing. Overgrazing should be avoided. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. There are no major management limitations for this use.

The main limitation if this soil is used as a site for dwellings with basements is the seasonal high water table. Foundation drains and protective coatings on basement walls will help alleviate wetness in basements. Diversion ditches and other drainage systems can also control surface water by carrying it away from foundations.

The main limitation if this soil is used as a site for local roads and streets is frost action. Construction plans should call for providing coarser grained subgrade material. Adequate surface and subsurface drainage in critical areas will also decrease the potential for frost action.

The main limitation if this soil is used as a site for septic tank absorption fields is the seasonal high water table. A better suited site on higher spots within the map unit should be considered for this use. A specially designed system such as the installation of a drainage system around an absorption field may remediate this limitation.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted during periods of high precipitation unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 2e.

60C—Grenville loam, 8 to 15 percent slopes

This soil is very deep, strongly sloping, and well drained. It is on shoulder and backslope positions of elongated hills and other convex slopes on glacial till lowlands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, dark brown loam

Subsoil:
9 to 12 inches, brown loam
12 to 17 inches, dark yellowish brown loam

Substratum:
17 to 35 inches, brown gravelly fine sandy loam
35 to 72 inches, brown gravelly fine sandy loam with common mottles

Included with this soil in mapping are about 5 percent moderately well drained Hogansburg soils on footslopes and gently sloping areas. About 5 percent of this unit is comprised of moderately deep Neckrock soils, and very deep, somewhat poorly drained Malone soils. Neckrock soils are associated with limestone rock outcrop and are usually in the highest positions on the landscape. Malone soils are on footslopes and other slightly concave positions. Also in this unit are small areas of moderately steep hillsides, and small areas that are very stony. In some areas, the surface texture is fine sandy loam or very fine sandy loam. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, subsoil, and upper substratum, and moderately slow in the lower substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: greater than 72 inches deep
Root zone: 24 inches deep or more
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in hay or other sod cover
This soil is moderately well suited to growing cultivated crops and hay. Erosion is commonly a management problem on long slopes planted to row crops. Future crop productivity may be reduced by loss of valuable topsoil. Cultivating along the contour of the landscape will help minimize soil erosion. Conservation tillage systems, crop rotation, stripcropping, and the use of cover crops are good management practices.

This soil is moderately well suited to pasture. Erosion can be a significant management problem on heavily grazed areas of this soil. Overgrazing should be avoided to reduce soil erosion and encourage key plant species. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. No major limitations exist for woodland management. However, windthrow can be a problem in included areas where seepage and less rooting depth occurs.

There are no major limitations if this soil is used as a site for dwellings with basements. However, there is a moderate limitation because of slope influence on landscape costs. Some seepage may also occur over the dense substratum during brief periods.

The main limitations if this soil is used as a site for local roads and streets are frost action and moderate slope conditions. Providing coarse grained subgrade material to frost depth will reduce the potential for heaving and buckling of pavement. Adequate surface and subsurface drainage in areas of somewhat poorly drained inclusions and also decreases the potential for frost action. Roads built along the slope contour will generally save construction and maintenance costs.

The main limitation if this soil is used as a site for septic tank absorption fields is the moderately slow permeability in the substratum. An alternate system or specially designed septic tank absorption field needs to be considered for this soil to avoid seepage problems and prolong the system use.

The main limitations if this soil is used as a site for shallow excavations are the dense substratum and moderate slope conditions. Excavation of soil material may be slower and somewhat more expensive than in soils with more friable or loose layers in the substratum.

The capability subclass is 3e.

61B—Hogansburg loam, 3 to 8 percent slopes

This soil is very deep, gently sloping, and moderately well drained. It occurs on undulating glacial till lowlands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 10 inches, very dark grayish brown loam

Subsoil:
10 to 15 inches, brown loam
15 to 19 inches, dark yellowish brown fine sandy loam with few mottles

Substratum:
19 to 35 inches, brown gravelly loam with many mottles
35 to 72 inches, brown gravelly loam with few mottles

Included with this soil in mapping are about 5 percent well drained Grenville soils on slightly more convex positions and areas near steeper slopes. About 5 percent of this unit includes somewhat poorly drained Malone soils on slightly concave or nearly level areas. Also included are soils similar to Neckrock soils with bedrock less than 60 inches deep. Small inclusions of similar soils occur in areas being slightly more acid in the subsoil and substratum. Small areas of very stony surface conditions occur near pastures and woodlots. In some areas, the surface texture is fine sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, subsoil, and upper substratum, and moderately slow in the lower substratum
Available water capacity (average for 40-inch profile): moderate

Depth to seasonal high water table: perched 18 to 24 inches deep at some time during March through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as hayland. This soil qualifies as prime farmland.

This soil is well suited to growing cultivated crops and hay. Erosion can be a serious management problem on long slopes that have been planted to row crops eventually reducing productivity. Care should be taken when cultivating by proceeding along the contour of the land. Conservation tillage systems, crop rotation, and the use of cover crops are good management practices.

This soil is well suited to pasture. Erosion can be a management problem on long slopes subject to heavy grazing. Overgrazing should be avoided. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. There are no major limitations for woodland management on this soil. However, windthrow can be a problem in included areas where seepage and less rooting depth occurs.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as inclusions of Grenville soils or a higher, nearby area. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Designing new roads with coarser grained subgrade material will help alleviate potential frost damage. Adequate surface and subsurface drainage in critical somewhat poorly drained areas will also decrease the potential for frost action.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability rate. A better suited site should be considered for this use. If this soil is used, higher spots within the map unit would likely perform better for this use. Conventional septic system designs may perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 2e.

62A—Malone gravelly loam, 0 to 3 percent slopes

This soil is very deep, nearly level, and somewhat poorly drained. It occurs on smooth and slightly concave glacial till plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown gravelly loam

Subsoil:
9 to 30 inches, brown gravelly fine sandy loam with many mottles

Substratum:
30 to 72 inches, grayish brown very gravelly sandy loam with few mottles

Included with this soil in mapping are about 5 percent moderately well drained Hogansburg soils on slightly higher positions and on undulating areas. About 5 percent of this unit includes very poorly drained Runeberg and Cook soils along drainageways and in landscape depressions. About 5 percent of this unit includes the somewhat poorly drained Coveytown soils where sandy surface and subsoil textures occur and the somewhat poorly drained Muskellunge soils in slight depressions where clayey textures dominate. Also there are small inclusions with very stony surfaces and areas moderately deep to bedrock. In some areas, the surface texture is fine sandy loam or sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, and moderately slow or slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hayland and pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage can improve farm operation efficiency and increase crop yield. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness in barn yards and heavily traveled areas of the pasture. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, maintenance of drainageways and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. The seasonal high water table may cause soft ground conditions for heavy equipment, especially in the spring. Wetness may adversely affect root growth and seedling survival. There is a moderate windthrow hazard because of limited rooting depth. Harvesting during drier periods or during frozen ground conditions will increase equipment use efficiency. Managing species that are wetness-tolerant and minimizing thinning are good practices on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Construction plans should specify providing coarser grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action and seasonal wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability of the soil. A better suited site should be considered for this use such as a more moderately permeable soil. Conventional septic system designs will perform poorly on this soil. Alternative systems that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

62B—Malone gravelly loam, 3 to 8 percent slopes

This soil is very deep, gently sloping and somewhat poorly drained. It occurs on slightly concave or undulating glacial till plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown gravelly loam

Subsoil:
9 to 30 inches, brown gravelly fine sandy loam with many mottles

Substratum:
30 to 72 inches, grayish brown very gravelly sandy loam with few mottles

Included with this soil in mapping are about 5 percent moderately well drained Hogansburg soils on slightly higher positions. About 5 percent of this unit includes very poorly drained Runeberg and Cook soils along drainageways and in depressions. About 5 percent of this unit includes the somewhat poorly drained Coveytown soils where sandy surface and subsoil textures occur and Muskellunge soils in slight depressions where clayey textures dominate. Also there are small inclusions of moderately deep Ogdensburg soils, and soils with a very stony surface. In some areas, the surface texture is fine sandy loam or sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, and moderately slow or slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hayland and pasture. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage will help improve efficiency of farm operations and increase crop yield. Conservation tillage systems, crop rotation, and maintenance of waterways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness in barn yards and heavily traveled areas of the pasture. Forage may show stunted growth during the early part of the growing season as a result of wetness. Rotational grazing, deferred grazing, proper stocking rates, surface drainage and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. The seasonal high water table may cause soft ground conditions for heavy equipment, especially in the spring. Wetness may adversely affect root growth and seedling survival. There is a moderate windthrow hazard because of the limited rooting depth. Harvesting during drier periods or during frozen ground conditions will increase equipment use efficiency. Managing species that are wetness-tolerant and minimizing thinning are good practices on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Construction plans should specify providing coarser grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action and seasonal wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability of the soil. A better suited site should be considered for this use such as a soil with moderately rapid permeability. Conventional septic system designs will perform poorly on this soil. Alternative systems that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 3w.

64—Runeberg mucky loam

This soil is very deep, nearly level, and very poorly drained. It is in low positions on glacial till plains. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, black mucky loam

Subsoil:
9 to 17 inches, brown cobbly loam with many mottles
17 to 22 inches, dark grayish brown sandy loam with common mottles

Substratum:
22 to 42 inches, grayish brown fine sandy loam with many mottles
42 to 72 inches, grayish brown gravelly fine sandy loam with few mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Malone and Peasleeville soils on slightly higher areas of the unit. About 5 percent of this unit consists of very poorly drained Wonsqueak soils in small depressions where organic matter is thick. Small areas of clayey Adjidaumo soils are included near lake plains where the soil is more clayey. Small areas of very poorly drained Cook soils are included where a sandy surface and subsoil is present. In some areas, the substratum is very gravelly or very cobbly. Included areas make up about 15 percent of this unit and range up to 5 acres each

Soil Properties

Permeability: moderate in the surface, moderately slow in the subsoil, and slow or moderately slow in the substratum.
Available water capacity (average for 40-inch profile): moderate to high
Depth to seasonal high water table: at the surface to 12 inches deep at some time from November through July
Root zone: mainly to 12 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland or brush.

This soil is poorly suited to growing cultivated crops and hay. Without adequate drainage measures, the seasonal high water table frequently delays planting in the spring and harvest in the fall. Surface and subsurface drainage can significantly improve the efficiency of farm operations and increase productivity. Because of the low position and nearly level topography, establishing a drainage outlet for this soil without adversely affecting important wetland can be difficult. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is poorly suited to pasture. The seasonal high water table causes the soil to be wet during most of the spring and fall. Selecting forage plants which are tolerant of wet soil conditions will help sustain productivity. Excessive grazing on this soil during the spring causes compaction and loss of forage cover. Rotational grazing, deferred grazing, proper stocking rates, maintenance of drainageways, and yearly mowing are good management practices.

The potential productivity for growing northern white cedar on this soil is moderately high. Because of the seasonal high water table, heavy equipment will commonly cause deep ruts and harvesting inefficiency. Harvesting operations tend to run smoother during dry or frozen periods on this soil. Wet soil conditions can retard root growth and seedling survival, and may cause severe windthrow in areas of this soil. Selecting species that are wetness-tolerant will help increase seedling survival and reduce windthrow. Minimizing thinning practices can also decrease windthrow.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. Better drained nearby soils should be considered for this use.

The main limitations if this soil is used as a site for local roads and streets are frost action and the seasonal high water table. New roads should be routed around this unit if possible. Roads placed on a raised bed of coarse grained material with adequate drainage will reduce frost action and water problems.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow percolation rate in the substratum. There is a risk of groundwater pollution or effluent seepage to the ground surface if this soil is used. A better suited site on a higher landscape position should be considered for this use. Conventional septic system designs will perform very poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations will be limited to the drier periods of the year unless drainage is installed. Sloughing trench walls may also occur because of wetness.

The capability subclass is 5w undrained and 4w drained.

66—Matoon silty clay loam, 0 to 2 percent slopes

This soil is moderately deep, nearly level, and somewhat poorly drained. It is mostly on broad basins or plains where clayey marine sediments are moderately deep over bedrock.

The typical sequence, depth, and composition of the layers of this soil are as follows—

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

Subsoil:
8 to 12 inches, dark gray and gray silty clay loam with many mottles
12 to 16 inches, gray silty clay with many mottles
16 to 27 inches, dark grayish brown clay with few mottles
27 inches, sandstone bedrock

Included with this soil in mapping are about 10 percent poorly drained Guff soils in depressions. About 5 percent of this unit includes Muskellunge soils where bedrock is deeper than 60 inches. On ridges or other slope changes, the well drained, loamy Summerville and Neckrock soils are included. Also included are areas where somewhat poorly drained soils are less than 20 inches deep to bedrock. Rock outcrops are often included in association with these areas. Included areas make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderately slow in the surface and upper subsoil, and slow in the lower subsoil
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 6 to 18 inches deep between November and May
Root zone: mainly in the upper 20 inches
Shrink-swell potential: moderate
Depth to bedrock: 20 to 40 inches

Many areas of this soil have been cleared, and are now in brush or reverting to woodland. Only drained areas of this soil are considered prime farmland.

This soil is moderately suited to growing cultivated crops. The seasonal high water table delays plowing and planting in the spring. Adequate drainage is needed to grow productive crops on this soil; but because of the moderately deep bedrock, subsurface drainage systems are not always practical. Interceptor drains that divert runoff from higher topographic areas may be effective in lowering the water table and increasing productivity. Adequate drainage outlets sometimes are difficult to construct because of the bedrock and because of the flatness of the terrain. Conservation tillage systems and maintaining a cover crop are good management practices.

This soil is moderately suited to pasture. The seasonal high water table restricts root growth of some plants, especially legumes. The soil is suited to shallow rooted legumes and grasses. This soil is particularly susceptible to compaction. Animals should be kept off when the soil is wet to avoid excessive compaction. Rotational grazing, proper stocking rates and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, heavy harvesting equipment can bog down in the spring and cause deep ruts. Dry soil conditions or frozen periods should be used for operating equipment on this soil. Wetness also causes limited root growth and a moderate windthrow hazard. Managing wetness-tolerant species and minimizing thinning are good practices on this soil.

The main limitations if this soil is used as a site for dwellings with basements are depth to bedrock and the seasonal high water table. Deeper nearby areas may be better suited for this use. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can help control surface water flow in some areas. The area can be landscaped with additional fill to compensate for the moderate depth to bedrock.

The low soil strength, seasonal high water table, and potential frost action are the main limitations if this soil is used as a site for local roads and streets. Providing suitable subgrade material and using special construction methods for adequate support are means of compensating for low soil strength and potential frost action. Constructing roads on raised fill material and installing a drainage system are ways to overcome the wetness limitation.

The main limitations if this soil is used as a site for septic tank absorption fields are the depth to bedrock, seasonal high water table, and slow permeability. Because conventional septic systems function poorly on this soil, a better suited site should be considered for this use. A specially designed treatment system to increase the filtering capacity of the soil is needed to avoid possible pollution of groundwater.

The main limitations for shallow excavations are the depth to bedrock and the seasonal high water table. Digging will be difficult because of hard limestone bedrock, and will necessitate blasting in most areas. Selecting deeper soils for excavations may significantly reduce costs. Digging operations may be restricted to the drier periods of the year unless drainage is installed.

The capability subclass is 3w.

68B—Fahey gravelly fine sandy loam, 3 to 8 percent slopes, loamy substratum

This soil is very deep and moderately well drained. It occurs on footslopes of gravelly beach ridges and on slightly concave areas of undulating outwash plains

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown gravelly fine sandy loam

Subsoil:
9 to 18 inches, brown very gravelly loamy fine sand
18 to 27 inches, dark yellowish brown very gravelly loamy fine sand with common mottles in the lower part

Substratum:
27 to 45 inches, brown very gravelly sand with common mottles
45 to 72 inches, light olive brown very gravelly silt loam with many mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Coveytown and Wainola soils in swales and shallow drainageways. About 5 percent of this unit consists of moderately well drained Occur and Croghan soils having less gravel in the surface and subsoil. Small areas of moderately well drained Hogansburg soils are included on knolls where texture is dominantly loam without a sandy mantle. Small areas of excessively drained Trout River soils are included on slightly higher, convex positions. Also included are small areas of very stony Fahey soils. In some areas, the surface texture is gravelly loamy fine sand or gravelly loamy sand. Included areas make up about 25 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the surface, subsoil and upper substratum, and moderate or moderately slow in the underlying glacial till
Available water capacity (average for 40-inch profile): very low
Depth to seasonal high water table: 18 to 24 inches deep at some time during March through May
Root zone: mainly to 24 inches deep

Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in pasture or woodland.

This soil is well suited to growing cultivated crops and hay. The seasonal high water table may delay planting in the early spring. Surface and subsurface drainage, especially in areas of somewhat poorly drained inclusions, will improve efficiency of farm operations and increase crop yields. Droughtiness may also occur in mid-summer because of very low available water capacity. Because of the high gravel and sand content, the potential for pesticide and nutrient loss from leaching in this soil is high. Conservation tillage systems, crop rotation, maintenance of waterways, and the addition of manure and other supplements in proper amounts are good management practices.

This soil is well suited to pasture. The seasonal high water table may cause some wetness problems in barn yards and heavily traveled areas of the pasture, especially in the spring. Forage plants may show stunted growth during the early part of the growing season as a result of wetness. Droughtiness may also affect forage production in mid-summer because of very low available water capacity. Rotational grazing, proper stocking rates, surface drainage, and yearly mowing are good management practices.

The potential productivity for growing eastern white pine on this soil is high. There are no major limitations for timber growth and management on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

A moderate limitation if this soil is used as a site for local roads and streets is the seasonal high water table. Adequate drainage in critical areas of this unit can increase road surface durability.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the soil's poor ability to filter effluent properly. A better suited site should be considered for this use. Conventional septic system designs may perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered. Because of the soil's rapid permeability, there is a possibility of ground water contamination from septic effluent.

The main limitations if this soil is used as a site for shallow excavations are the soil's tendency to cave in and the seasonal high water table. The banks of the excavation should be mechanically supported to avoid the possibility of soil caving in on workers or other victims. Seasonal wetness may delay digging operations during part of the year unless drainage is installed.

The capability subclass is 2w.

69A—Coveytown loamy sand, 0 to 3 percent slopes

This soil is very deep, nearly level, and somewhat poorly drained. It occurs at the base of ridges and in concave areas of glacial till deposits that have been modified by both wave action and deposition of sands.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 8 inches, very dark grayish brown loamy sand

Subsoil:
8 to 10 inches, yellowish brown and very dark grayish brown sand
10 to 17 inches, light yellowish brown sand with common mottles
17 to 28 inches, light brownish gray and pale brown sand with common mottles

Substratum:
28 to 48 inches, dark grayish brown gravelly fine sandy loam with many mottles
48 to 72 inches, grayish brown gravelly sandy loam with common mottles

Included with this soil in mapping are about 5 percent very poorly drained Cook and Runeberg soils in lower areas of depressions. About 5 percent moderately well drained Occur and Fahey soils are included on slightly more convex areas of the landscape. About 5 percent somewhat poorly drained Malone and Peasleeville soils are in areas where the sandy mantle is thin or absent. Also included are small areas of somewhat poorly drained Sciota and Wainola soils in places where the sandy mantle is thicker than 40 inches, and small areas of similar soil having a more clayey substratum. In some areas the surface texture is loamy fine sand or cobbly loamy fine sand. Included areas make up about 25 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately rapid or rapid in the surface and subsoil, and moderate or moderately slow in the substratum
Available water capacity (average for 40-inch profile): very low to low

Depth to seasonal high water table: 12 to 18 inches below the surface at some time during November through May
Root zone: mainly to 16 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in pasture or hayland.

This soil is moderately suited to growing cultivated crops and hay. The seasonal high water table can delay planting in the spring. Surface and subsurface drainage systems can help improve efficiency of farm operations and also increase crop yields. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture especially in the spring. Forage plants may show stunted growth during the early part of the growing season as a result of wetness. Deferred grazing, rotational grazing, proper stocking rates, maintaining drainage structures, and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, soft ground conditions may limit the use of heavy harvesting equipment to drier periods of the year. Seedling mortality and windthrow are considered moderate management concerns on this soil because of restricted root growth, especially in areas of poorly drained inclusions. Managing wetness-tolerant species and minimizing thinning are good practices on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area within the map unit or on a nearby landform. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

Moderate limitations of this soil for local roads and streets are the seasonal high water table and frost action. Roads constructed on raised coarse grained fill material with adequate drainage installed will generally require less maintenance costs in the long-term.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, the moderately slow permeability in the substratum, and the soil's poor ability to filter effluent properly in the upper part of the soil. A better suited site should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and the soil's tendency to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness. The banks of the excavation should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 3w.

70—Guff silty clay loam

This soil is moderately deep, nearly level, and poorly drained. It is on low-lying areas where clayey marine sediments are moderately deep over bedrock. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark gray silty clay loam

Subsoil:
9 to 20 inches, dark gray clay with many mottles
20 to 39 inches grayish brown silty clay with common mottles
39 inches, weathered limestone bedrock

Included with this soil in mapping are about 10 percent Dorval muck occurring in pockets where organic matter accumulates on the surface. About 5 percent are Adjidaumo soils included where bedrock is greater than 40 inches deep. Somewhat poorly drained Matoon soils are included on slightly convex areas within the map unit. Small areas of bedrock outcrop are included in a few places. Included areas make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderately slow in the surface and slow or very slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: at the soil surface to a depth of 6 inches from November through June
Root zone: mainly in the upper 12 inches
Shrink-swell potential: moderate
Depth to bedrock: 20 to 40 inches

Most of this soil is in woodland or brush. A few areas are used as unimproved pasture.

This soil is poorly suited to cultivated crops. The clayey texture and wetness of the soil surface makes it difficult to achieve worthwhile yields. The seasonal high water table can severely hinder planting and harvesting operations. Because of the heavy texture, moderate depth to bedrock, and low-lying position of this soil, this map unit is very difficult to drain.

The soil has poor suitability for pasture or hayland because of wetness. To preserve tilth and pasture seeding, grazing should be avoided when wet soil conditions exist. The hooves of grazing stock compact the topsoil destroying its structure and tilth. Rotational grazing, proper stocking rates, and yearly mowing are good management practices.

Potential productivity for red maple on this soil is moderate. This wet soil tends to be soft under heavy equipment because of a seasonal high water table and high clay content. Logging during dry periods or during frozen ground conditions can enhance equipment use. Wet soil also severely limits seedling survival. Planting species adapted to wet conditions will improve productivity. Because of the seasonal high water table and moderate depth to bedrock, trees tend to have shallow roots and blow over easily. Keeping thinning to a minimum and planting water-tolerant species reduces windthrow.

The seasonal high water table and the depth to bedrock are severe limitations if this soil is used as a site for dwellings with basements. Installing drains by footings and sealing foundations will help prevent a wet basement. Building above the bedrock and landscaping with additional fill is a means of compensating for the moderate depth to bedrock. Building on adjacent drier and deeper soils, if available, is generally the best alternative.

The seasonal high water table, low soil strength, and potential frost action are the main limitations if this soil is used as a site for local roads and streets. Constructing roads on raised fill material and installing a drainage system are ways to minimize wetness. Providing suitable subgrade material and using special construction methods for adequate support are ways to compensate for low soil strength and minimize frost action.

The depth to bedrock, seasonal high water table, and slow permeability are severe limitations if this soil is used as a site for septic tank absorption fields. A better suited site should be considered for this use such as on better drained nearby soils.

The main limitations for shallow excavations are the seasonal high water table and depth to bedrock. Digging operations may be limited to dry periods of the year unless drainage is installed. Because of the bedrock hardness, blasting may be needed to deepen trenches in many areas. Routing excavations around this unit through deeper soils may significantly reduce project costs.

The capability subclass is 4w

94B—Neckrock-Summerville complex, gently sloping, rocky

This unit consists of well drained soils overlying limestone bedrock benches. The Neckrock soils are moderately deep to bedrock and generally on broad, smooth, slightly convex positions. The Summerville soils are shallow and generally near bedrock outcrops. Exposed bedrock covers up to 2 percent of the surface of the unit. This unit consists of about 45 percent Neckrock soils, 35 percent Summerville soils, and 20 percent other soils and rock outcrop. The Neckrock and Summerville soils are so intermingled that it was not practical to map them separately. Slopes range from 0 to 8 percent.

The typical sequence, depth, and composition of the layers of Neckrock soils are as follows—

Surface:
0 to 9 inches, very dark grayish brown loam

Subsoil:
9 to 17 inches, brown and yellowish brown loam
17 to 27 inches, yellowish brown and dark yellowish brown cobbly loam

Substratum:
27 to 32 inches, brown very gravelly loam
32 inches, dark gray limestone bedrock

The typical sequence, depth, and composition of the layers of Summerville soils are as follows—

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

Subsoil:
5 to 12 inches, brown loam
12 inches, dark gray limestone bedrock

Included with this unit in mapping are about 5 percent somewhat poorly drained Ogdensburg soils on slightly concave positions of the landscape. About 5 percent of this unit consists of deep Grenville and Hogansburg soils on footslopes and in areas of highly weathered bedrock. Also included are small areas of somewhat poorly drained Malone soils and very poorly drained Runeberg soils along toeslopes and drainageways. Small areas that are very shallow to limestone bedrock are also included. Inclusions make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Neckrock soils

Permeability: moderate in the surface and upper subsoil, and moderate or moderately slow in the lower subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: greater than 72 inches deep
Root zone: to bedrock depth
Shrink-swell potential: low
Depth to bedrock: 20 to 40 inches

Summerville soils

Permeability: moderate throughout
Available water capacity (average for 40-inch profile): very low
Depth to seasonal high water table: greater than 72 inches deep
Root zone: to bedrock depth
Shrink-swell potential: low
Depth to bedrock: 10 to 20 inches

Most areas of this soil are in woodland or reverting to brush.

This unit tends to be poorly suited to cultivated crops and hay. In areas of rock outcrops and stoniness, excessive wear on machinery is common. Erosion can be a problem on shallow Summerville soils where soil productivity is already limited. Maintaining vegetative cover on this unit will help conserve topsoil. Conservation tillage systems, crop rotation, and use of cover crops are good management practices.

This unit is poorly suited to pasture. Rock outcrops may discourage efficient use of equipment for pasture improvements and management. Erosion can also become a problem on heavily traveled areas of this unit. Avoiding excessive grazing will help prevent significant sheet and gully erosion. Key pasture species are at risk from weed competition where grazing is left unchecked. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this unit is moderate. Equipment use has a moderate limitation because of bedrock outcropping associated with Summerville soils. There is a moderate risk of seedling mortality in shallow Summerville soils because of the very low available water capacity. Selecting varieties which are tolerant to dry soil conditions as well as planting during sufficient soil moisture are ways to improve seedling survival. Also, due to shallow areas in this unit, there is a severe risk of windthrow in areas of Summerville soils. Planting shallow-rooted species while minimizing clear cutting operations can reduce windthrow potential.

The main limitation if this unit is used as a site for dwellings is the depth to bedrock. Areas of deeper inclusions or adjacent units of soils such as Grenville may be better suited. Dwellings with basements can be built on or above bedrock and then landscaped with additional fill.

The main limitation if this unit is used as a site for local roads and streets is the depth to bedrock. Where rock is encountered, blasting is commonly needed to allow for proper grading and smoothing. Planning road grades and locations to avoid removal of bedrock will help reduce construction costs.

The main limitation if this unit is used as a site for septic tank absorption fields is depth to bedrock. Also, in areas of Neckrock soils, the lower part of the profile has moderately slow permeability. There is a possible risk of septic effluent seeping into water supplies. A better suited site should be considered for septic systems. If this unit is used, alternative designs that increase the absorptive and filtering capacity of the system will be needed.

The main limitation if this unit is used as a site for shallow excavations is the depth to bedrock. Digging will be difficult because of hard limestone bedrock which generally requires blasting for removal. Selecting deeper, nearby soils will facilitate excavation of trenches.

The capability subclass is 6s.

94C—Neckrock-Summerville complex, strongly sloping, rocky

This unit consists of well drained soils overlying limestone bedrock benches. The Neckrock soils are moderately deep to bedrock and generally on broad backslopes and rolling areas near outcrops. The Summerville soils are shallow and generally on slope shoulders near outcrops. Exposed bedrock covers up to 2 percent of the surface of this unit. This unit consists of about 45 percent Neckrock soils, 35 percent Summerville soils, and 20 percent other soils and rock outcrop. The Neckrock and Summerville soils are so intermingled that it was not practical to map them separately. Slopes range from 8 to 15 percent.

The typical sequence, depth, and composition of the layers of Neckrock soils are as follows—

Surface:
0 to 9 inches, very dark grayish brown loam

Subsoil:
9 to 17 inches, brown and yellowish brown loam
17 to 27 inches, yellowish brown and dark yellowish brown cobbly loam

Substratum:
27 to 32 inches, brown very gravelly loam
32 inches, dark gray limestone bedrock

The typical sequence, depth, and composition of the layers of Summerville soils are as follows—

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

Subsoil:
5 to 12 inches, brown loam
12 inches, dark gray limestone bedrock

Included with this unit in mapping are about 5 percent somewhat poorly drained Ogdensburg soils on slightly concave positions of the landscape. About 5 percent of this unit consists of deep Grenville and Hogansburg soils on footslopes and in areas of highly weathered bedrock. Also included are small areas of somewhat poorly drained Malone soils and very poorly drained Runeberg soils along toeslopes and drainageways. Small areas that are very shallow to limestone bedrock are also included. Inclusions make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Neckrock soils

Permeability: moderate in the surface and upper subsoil, and moderate or moderately slow in the lower subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: greater than 72 inches deep
Root zone: to bedrock depth
Shrink-swell potential: low
Depth to bedrock: 20 to 40 inches

Summerville soils

Permeability: moderate throughout
Available water capacity (average for 40-inch profile): very low
Depth to seasonal high water table: greater than 72 inches deep
Root zone: to bedrock depth
Shrink-swell potential: low
Depth to bedrock: 10 to 20 inches

Most areas of this soil are in woodland or reverting to brush.

This unit tends to be poorly suited to cultivated crops and hay. In areas of rock outcrops and stoniness, excessive wear on machinery is probable. Erosion can be a serious problem, especially on shallow Summerville soils where soil productivity is already limited. Maintaining vegetative cover on this unit will help conserve topsoil. Conservation tillage systems, crop rotation, and use of cover crops are good management practices.

This unit is poorly suited to pasture. Possible damage from rock outcrops may discourage the use of equipment for pasture improvements and management. Erosion can be a serious management concern on heavily traveled areas of this unit. Avoiding excessive grazing will alleviate significant sheet and gully erosion. Key pasture species are at risk from weed competition where grazing is left unchecked. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this unit is moderate. Equipment use has a moderate limitation because of bedrock outcropping associated with Summerville soils. There is a moderate risk of seedling mortality in shallow Summerville soils because of the very low available water capacity. Selecting varieties which are tolerant to dry soil conditions as well as planting during sufficient soil moisture are ways to improve seedling survival. Also, due to shallow areas in this unit, there is a severe risk of windthrow in areas of Summerville soils. Planting shallow-rooted species while minimizing clear cutting operations can reduce the windthrow potential.

The main limitation if this unit is used as a site for dwellings is the depth to bedrock. Areas of deeper inclusions or adjacent units of soils such as Grenville may be better suited. Dwellings with basements can be built on or above bedrock and then landscaped with additional fill.

The main limitation if this unit is used as a site for local roads and streets is the depth to bedrock. Where rock is encountered, blasting is commonly needed to allow for proper grading and smoothing. Planning road grades and locations to avoid removal of bedrock will help reduce construction costs.

The main limitation if this unit is used as a site for septic tank absorption fields is depth to bedrock. Also, in areas of Neckrock soils, the lower part of the profile has moderately slow permeability. There is a possible risk of septic effluent seeping into water supplies. A better suited site should be considered for this use. If this unit is used, alternative designs that increase the absorptive and filtering capacity of the system will be needed.

The main limitation if this unit is used as a site for shallow excavations is the depth to bedrock. Digging will be difficult because of hard limestone bedrock which generally requires blasting for removal. Selecting deeper nearby soils will facilitate excavation of trenches.

The capability subclass is 6s.

101—Wonsqueak muck

This soil is very deep, nearly level and very poorly drained. It consists of highly decomposed organic material over mineral soil on depressions of glacial till, glacial outwash and lake plains. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 7 inches, black muck

Subsurface:
7 to 31 inches, very dark brown muck

Substratum:
31 to 72 inches, dark gray silt loam

Included with this soil in mapping are about 10 percent Runeberg and Adjidaumo soils along the fringe and narrow areas of this unit. About 5 percent Bucksport soils with thicker organic deposits occur in larger depressions and bogs. Small areas of somewhat poorly drained Ogdensburg soils occur near bedrock outcrops. Small areas of Medomak soils occur along streams. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow to moderately rapid in the organic part, and moderately slow or moderate in the mineral substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 inches above the surface to 6 inches below the surface from September through July
Root zone: mainly to 12 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland.

This soil is poorly suited to growing cultivated crops and hay because of the seasonal high water table. The surface is covered by water during most of the growing season. Outlets for drainage systems may be very difficult to establish without adversely affecting important wetlands.

This soil is poorly suited to pasture. The seasonal high water table is near the surface during most of the growing season. Areas of this soil will not support typical forage species. Ground conditions are generally too soft for livestock traffic resulting in poor grazing and soil erosion. Drier areas should be considered for this use.

The potential productivity for growing black spruce on this soil is moderate. However, these organic soils have low bearing strength for heavy equipment resulting in deep ruts and inefficiency when crossed. Because of the seasonal high water table, seedling mortality is significantly high except for water-tolerant species. Root growth is restricted to a shallow depth in this commonly saturated soil making windthrow a likely occurrence.

The main limitations if this soil is used as a site for dwellings are the seasonal high water table and the tendency of the soil to subside over time. A better suited site should be considered such as a higher area nearby.

The main limitations if this soil is used as a site for local roads and streets are the tendency of the soil to subside over time, ponding, and the potential frost action. Roads should be routed around this map unit where possible. If this soil is used, roads should be constructed on raised coarse grained fill material with adequate drainage installed.

The main limitations if this soil is used as a site for septic tank absorption fields are ponding and the moderately slow permeability. A better suited site on a higher position on the landscape should be considered for this use.

The main limitations if this soil is used as a site for shallow excavations are ponding and the excess organic material. Digging operations will likely be limited to dry periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur. Because of high organic content, this soil will present great difficulty in maneuvering conventional digging equipment, and may require special excavation machinery.

The capability subclass is 7w.

104—Udorthents, wet substratum

This map unit is very deep, nearly level or gently sloping and somewhat poorly drained. It occurs on a variety of landscapes and consists of construction projects, unpaved parking areas and fill material. The fill material or may be relatively thin; but, generally it occurs in slightly concave landscape positions. Slopes range from 0 to 8 percent.

The typical sequence, depth, and composition of the layers of this unit are variable depending on the source of the fill, and therefore, not provided here.

Included with this unit in mapping are small areas of well drained and moderately well drained fill material on slightly convex positions. Small areas of poorly drained and very poorly drained soils are included in depressions and near drainageways. Small areas of concrete, asphalt, bricks and other man-made material are included. Also included are small areas of sandy fill material and small areas of undisturbed soils. Included areas make up about 10 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: variable; onsite investigation is needed
Available water capacity (average for 40-inch profile): low or moderate
Depth to seasonal high water table: 12 to 36 inches deep at some time from October through July; onsite investigation is needed
Root zone: mainly to 12 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches; onsite investigation is needed

Variability of soil characteristics of this map unit makes onsite investigation necessary to determine the potential of this unit for any use.

This unit is not assigned a capability subclass.

105—Udorthents, smoothed

This map unit is very deep, nearly level to strongly sloping, and well drained. It occurs on a variety of landscapes and consists of construction projects, unpaved parking areas, and fill material. Slopes range from 0 to 15 percent, but are dominantly 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this unit are variable depending on the source of the material, and therefore, not provided here.

Included with this soil in mapping are small areas of somewhat poorly drained and poorly drained soils and fill material. Undisturbed soil areas are included in this unit. Small areas of concrete, asphalt, bricks and other man-made material are also included. Included areas make up about 10 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: variable; onsite investigation is needed
Available water capacity (average for 40-inch profile): low or moderate
Depth to seasonal high water table: generally greater than 36 inches deep during November through June; onsite investigation is needed
Root zone: mainly to 20 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches; onsite investigation is needed

Variability of soil characteristics of this map unit makes onsite investigation necessary to determine the potential of this unit for any use.

This unit is not assigned a capability subclass.

107—Udorthents loamy

This map unit is very deep, nearly level to moderately steep, and well drained. It occurs along the St. Lawrence River in the form of dredging material that originated from the shipping channel. Most areas remain in the form of debris piles and some areas are smoothed over as fill material. Slopes range from 0 to 25 percent.

The typical sequence, depth, and composition of the layers of this unit are variable, depending on the source of material.

Included with this map unit are small areas of undisturbed soil such as Malone, Hogansburg, and Croghan soils near the fringe of this unit. Also included are small areas of man-made debris and alkaline soil. Included areas make up about 10 percent of this map unit and range up to 5 acres each.

Soil Properties

Permeability: variable; onsite investigation needed
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: generally greater than 36 inches deep during November through June; onsite investigation is needed.
Root zone: generally unrestricted
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Variability of soil characteristics of this map unit makes onsite investigations necessary to determine the potential of this unit for any use.

This unit is not assigned a capability subclass.

110—Borosaprists and Fluvaquents, frequently flooded

This unit consists of very deep, level, very poorly drained soils formed in organic and mineral deposits. It occurs in depressions and along the perimeter of water bodies occupying glacial lake plains and till uplands. Some upland areas of this unit are the result of beaver dams blocking drainageways. Borosaprists commonly occupy areas near stationary water while Fluvaquents are commonly near moving water. This unit is covered by water during most of the year. Typically, these areas consist of 40 percent Borosaprists, 40 percent Fluvaquents, and 20 percent other soils. However, some areas of this unit may be mostly Borosaprists and other areas may be mostly Fluvaquents. Slope is less than 1 percent.

A typical sequence, depth, and composition of layers in the Borosaprists part of this unit are not provided because of its variability. However, Borosaprists generally consist of black to dark gray, well decomposed organic material 16 to 60 inches thick. This material overlies a very dark gray to olive gray substratum with textures ranging from sand to silty clay.

A typical sequence, depth, and composition of layers in the Fluvaquents part of this unit are not provided because of its variability. However, Fluvaquents generally consist of black to olive gray mineral and organic material that is 2 to 15 inches thick. The underlying layer is a very dark grayish brown to light olive gray substratum with textures ranging from sandy loam to silty clay loam.

Included with this unit in mapping are small intermixed areas of very poorly drained Bucksport, Wonsqueak, Runeberg, Cook, Adjidaumo and Medomak soils. Small areas of poorly drained Adjidaumo and Rumney soils are on slightly higher positions of this unit. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Borosaprists

Permeability: moderately slow to moderately rapid in the surface and subsurface organic layers, and moderately slow to rapid in the substratum; onsite investigation is needed.
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 inches above the surface to 12 inches below the surface from September through July
Root zone: up to 6 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Fluvaquents

Permeability: slow to moderately rapid in the surface, and slow to rapid in the substratum; onsite investigation needed
Available water capacity (average for 40-inch profile): moderate to high
Depth to seasonal high water table: 24 inches above the surface to 18 inches below the surface from October through June
Root zone: generally to 6 inches deep
Shrink-swell potential: low to moderate
Depth to bedrock: greater than 60 inches

Cattails, sedges and other water-tolerant plants cover most of the acreage of this unit. Trees are on the edges of some units where the water is shallow. Ponding, seasonal high water table, soil instability, and the lack of drainage outlets severely limit this unit for most uses. It typically represents important wetland wildlife habitat.

The capability subclass is 8.

144—Roundabout silt loam

This soil is very deep, nearly level, and somewhat poorly drained. It is on slightly concave areas of lake plains and in low positions on uplands. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown silt loam

Subsoil:
9 to 18 inches, light olive brown very fine sandy loam with many mottles
18 to 23 inches, grayish brown silt loam with common mottles
23 to 31 inches, gray very fine sandy loam with common mottles

Substratum:
31 to 37 inches, gray silt loam with common mottles
37 to 45 inches, dark gray silty clay loam with few mottles
45 to 72 inches, dark gray silt loam

Included with this soil in mapping are about 5 percent moderately well drained Nicholville soils on slightly higher areas of the unit. About 5 percent of this map unit consists of Mino soils in areas of more sand and less silt. Also included are about 5 percent Hailesboro soils where the subsoil has more clay. Small areas of poorly drained Deinache soils are in sandy deposits near outwash plains and terraces. Small areas of very poorly drained Pinconning soils are in depressions. Included areas make up 20 percent of this map unit and range up to 5 acres each.

Soil Properties

Permeability: moderately slow or moderate in the surface and subsoil, and slow or moderately slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 to 18 inches deep at some time from November through May
Root zone: mainly to 20 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Many areas of this soil are used as hayland. Other areas are in pasture or woodland. Only drained areas of this soil qualify as prime farmland.

This soil is moderately suited to growing cultivated crops and hay. Without adequate drainage measures, the seasonal high water table commonly delays planting in the spring and harvest in the fall. Surface and subsurface drainage can significantly improve farm operation efficiency and increase crop productivity. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is moderately suited to pasture. The seasonal high water table causes the soil to be wet during part of the growing season. Selecting forage plants which are tolerant of wet soil conditions will help sustain productivity. Excessive grazing during wet soil conditions increases the potential for surface compaction and subsequent loss of desired plant species. Rotational grazing, proper stocking rates, maintenance of drainageways, and yearly mowing are good management practices.

The potential productivity for growing eastern white pine on this soil is very high. Because of the seasonal high water table, heavy equipment can bog down in the soil causing ruts and inefficiency. Harvesting during summer or during frozen ground conditions can improve operation efficiency. Root growth is limited by seasonal wetness causing severe windthrow in some areas. By minimizing clear-cutting activities and selecting species tolerant of wet soil conditions, seedling survival can be improved and windthrow reduced.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. Well drained nearby soils may be better suited for this use. Foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also help control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Constructing roads on a raised bed of coarser grained material and providing adequate drainage will decrease the potential for damage from frost action and wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability in the substratum. A better suited site should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be limited to the drier periods of the year unless drainage is installed.

The capability subclass is 3w.

147A—Flackville loamy fine sand, 0 to 3 percent slopes

This soil is very deep and moderately well drained. It is on glacial lake plains.

The typical sequence, depth, and composition of the layers of this map unit are as follows—

Surface:
0 to 12 inches, very dark grayish brown loamy fine sand

Subsurface:
12 to 14 inches, light brownish gray fine sand

Subsoil:
14 to 16 inches, dark brown sand
16 to 22 inches, brown sand
22 to 26 inches, very pale brown loamy fine sand with common mottles

Substratum:
26 to 48 inches, dark grayish brown silty clay with many mottles
48 to 72 inches, grayish brown silty clay with common mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Stockholm and Swanton soils in slight depressions and along drainageways. About 5 percent of this unit includes somewhat poorly drained Wainola and Sciota soils and moderately well drained Croghan soils where deep sandy deposits occur. Included are about 5 percent moderately well drained soils that are loamy over silts and clay. Also included are soils similar to moderately deep Neckrock soils and soils similar to Mino having deep loamy deposits. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the sandy upper part, and slow or very slow in the clayey part
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 18 to 24 inches below the surface at some time during November through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low in the sandy upper part, and moderate in the clayey part
Depth to bedrock: greater than 60 inches

Most areas of this soil are in hay. This soil qualifies as prime farmland.

This soil is well suited to growing cultivated crops and hay. The seasonal high water table may delay planting and harvesting operations after periods of heavy precipitation. Installation of drainage, especially in somewhat poorly drained inclusions, will aid in the efficiency of farm operations. Using conservation tillage systems and crop rotations, and establishing a cover crop are good management practices.

This soil is well suited to pasture. The seasonal high water table may cause some wetness problems in barn yards and other heavily traveled areas. Wind erosion can be a management problem in areas where vegetation has been damaged by heavy grazing. Rotational grazing, proper stocking rates and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. There are no major woodland management limitations on this soil.

The main limitation if this soil is used as a site for dwellings with basements is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

Moderate limitations on this soil for local roads and streets are the seasonal high water table, frost action, and shrink-swell potential in the substratum. Construction plans should call for providing coarser grained subgrade material. Adequate surface and subsurface drainage in critical areas will also decrease the potential for frost action as well as wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, the slow permeability in the clayey substratum and its poor ability to filter effluent properly in the upper part of the soil. A better suited site should be considered for this use. If this soil is used, higher spots would likely perform better for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table and the tendency for sidewalls to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness. Trench walls should be supported mechanically to prevent cave-in on workers or other victims.

The capability subclass is 2w.

147B —Flackville loamy fine sand, 3 to 8 percent slopes

This soil is very deep and moderately well drained. It is on slightly convex or undulating areas of lake plains.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 12 inches, very dark grayish brown loamy fine sand

Subsurface:
12 to 14 inches, light brownish gray fine sand

Subsoil:
14 to 16 inches, dark brown sand
16 to 22 inches, brown sand
22 to 26 inches, very pale brown loamy fine sand with common mottles

Substratum:
26 to 48 inches, dark grayish brown silty clay with many mottles
48 to 72 inches, grayish brown silty clay with common mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Swanton soils in slight depressions and along drainageways. About 5 percent of this unit includes somewhat poorly drained Wainola and Sciota soils and moderately well drained Croghan soils where deep sandy deposits occur. Also included are about 5 percent moderately well drained soils that are loamy over silts and clay. Also included are soils similar to moderately deep Neckrock soils, and soils similar to Mino having deep loamy deposits.

Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the sandy upper part, and slow or very slow in the clayey part
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 18 to 24 inches below the surface at some time during November through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low in the sandy upper part, and moderate in the clayey part
Depth to bedrock: greater than 60 inches

Most areas of this soil are used for hay. This soil qualifies as prime farmland.

This soil is well suited to growing cultivated crops and hay. The seasonal high water table may delay planting and harvesting operations after periods of heavy precipitation. Installation of drainage, especially in somewhat poorly drained inclusions, will aid in the efficiency of farm operations. Conservation tillage systems, crop rotations, and establishing a cover crop are good management practices.

This soil is well suited to pasture. The seasonal high water table may cause some wetness problems in barn yards and other heavily traveled areas. Erosion can be a management problem particularly on long slopes subject to heavy grazing. Rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. There are no major woodland management limitations on this soil.

The main limitation if this soil is used as a site for dwellings with basements is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

Moderate limitations on this soil for local roads and streets are the seasonal high water table, frost action, and shrink-swell potential in the substratum. Construction plans should call for providing coarser grained subgrade material. Adequate surface and subsurface drainage in critical areas will also decrease the potential for frost action as well as wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, the slow permeability in the clayey substratum and its poor ability to filter effluent properly in the upper part of the soil. A better suited site should be considered for this use. If this soil is used, higher spots would likely perform better for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table and the tendency for sidewalls to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness. Trench walls should be supported mechanically to prevent cave-in on workers or other victims.

The capability subclass is 2w.

148—Stockholm loamy fine sand

This map unit consists of very deep, nearly level, poorly drained soils that formed in a sandy mantle overlying clayey sediments. It is in low positions on lake and marine plains, and at the base of ridges and gentle rises in the landscape. Slopes range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 10 inches, dark brown loamy fine sand

Subsoil:
10 to 12 inches, dark reddish brown loamy fine sand
12 to 20 inches, yellowish brown and dark reddish brown fine sand
20 to 23 inches, light brownish gray fine sand with common mottles
23 to 30 inches, gray clay with many mottles

Substratum:
30 to 58 inches, gray clay with many mottles
58 to 72 inches, dark brown clay loam with common mottles

Included with this soil in mapping are about 10 percent poorly drained Deinache soils, and very poorly drained Pinconning and Munuscong soils in low pockets and along streams. About 5 percent of this unit includes moderately well drained Flackville soils on slightly convex spots. Croghan and Wainola soils are included where the clayey layers are deeper than 40 inches. Fine-textured Adjidaumo soils are included in places where the sandy mantle is absent. Also included are small areas of loamy Hogansburg or

Malone soils on small knolls. Included areas make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderately rapid in the sandy parts of the surface soil and subsoil, and very slow in the clayey layers of the lower subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: at the surface to 12 inches from November through May
Root zone: mostly in the upper 18 inches
Shrink-swell potential: low in the sandy surface and subsoil, moderate in the clayey parts of the subsoil and substratum.
Depth to bedrock: greater than 60 inches

Much of this unit is used for hayland and pasture. Many other areas are wooded. Some areas that were cleared are now idle and reverting to brush.

This unit is poorly suited for cultivated crops. The seasonal high water table is the main limitation. Wetness interferes with timely planting and harvesting. In addition, wetness limits the development of root systems that are needed to sustain plant growth. Productivity can be improved by artificial drainage. Conservation tillage systems, crop rotation, and the use of sod crops are good management practices.

This unit has fair suitability for pasture. The seasonal high water table restricts the rooting depth of some plants, especially legumes. Draining the soil with tile and open ditches and selecting shallow-rooted, water-tolerant grasses will improve productivity. Overgrazing may result in the loss of pasture seedlings. Rotational grazing, restricting grazing during wet periods, and yearly mowing are practices that will enhance the quality and quantity of feed and forage.

The potential productivity for red maple on this soil is moderate. The seasonal high water table during spring and other wet periods causes heavy equipment to bog down and create operational inefficiency. Logging when the surface is dry or frozen can reduce this problem. Because the surface is often saturated in spring, the rate of seedling mortality on this unit can be excessive. Planting seedlings when the soil is moist, but not wet, will optimize the rate of seedling survival. There is a moderate windthrow hazard because wetness limits the development of an anchoring root system. Keeping thinning to a minimum and planting shallow rooted varieties are ways to minimize windthrow.

The seasonal high water table is the main limitation if this unit is used as a site for dwellings with basements. Placing drains by footings will help overcome this limitation. Adequately sealing the foundation will help prevent a wet basement. If possible, placing the dwelling on a better drained inclusion or nearby unit may be the best alternative.

The seasonal high water table and low soil strength are the main limitations if this unit is used as a site for local roads and streets. Constructing on raised fill material and installing a drainage system are means of overcoming the wetness limitation. Providing suitable subgrade material and special construction for adequate support are methods of compensating for low soil strength of this soil.

The seasonal high water table and the very slow permeability in the clayey substratum are the main limitations if this unit is used as a site for septic tank absorption fields. Conventional septic systems perform poorly in this soil. A specially designed system may be needed on this unit. If possible, placing the filter field in a better suited nearby soil is often the best alternative.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and the tendency for sidewalls to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area will also likely occur because of wetness. Trench walls should be supported mechanically to prevent potential cave-in on workers.

The capability subclass is 4w.

149—Pinconning mucky loamy fine sand

This soil is very deep and very poorly drained. It is in low areas on broad plains, and in depressions. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark brown mucky loamy fine sand

Substratum:
9 to 11 inches, gray fine sand with few mottles
11 to 22 inches, light gray and grayish brown fine sand with few mottles
22 to 36 inches, gray loamy fine sand with common mottles.
36 to 60 inches, dark gray varved silt loam and silty clay with common mottles
60 to 72 inches, dark gray silty clay with common mottles

Included with this soil in mapping are about 5 percent moderately well drained Flackville and somewhat poorly drained Swanton soils on slightly higher positions. About 5 percent of this map unit are somewhat poorly drained Sciota and poorly drained Deinache soils where sand deposits are deeper. Also included are Wonsqueak soils in places with moderately thick organic deposits, and similar soils with loamy subsoil or silt loam substratum layers. Inclusions make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: rapid in the surface and sandy upper substratum, and slow or very slow in the clayey substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 12 inches above the surface to 12 inches below the surface at some time between October through May
Root zone: mainly to 12 inches deep
Shrink-swell potential: low in the surface and sandy upper substratum, and high in the clayey substratum
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland.

This soil is poorly suited to growing cultivated crops and hay because of ponding and the seasonal high water table. The surface is covered by water during part of the growing season. Drainage is often difficult or expensive to install in this soil without draining fragile wetland because of poor outlets. Important wetland habitat may be lost as a result of lowering the water table.

This soil is poorly suited to pasture. Ponding and wetness during the growing season seriously limit forage growth. Also, the impact of livestock traffic will damage forage and destroy important soil structure needed for good root growth. Deferred grazing, rotational grazing, proper stocking rates, and yearly mowing when possible, are good management practices.

The potential productivity for growing quaking aspen on this soil is moderate. Wet soil conditions depress growth rates and limit the number of adaptable species. Wetness also hinders heavy equipment use in the spring and during other wet periods. Logging during drier periods or in winter when the ground is frozen, will help overcome this limitation. The rate of seedling mortality can be excessive because of wetness. Seedling mortality may be decreased by timely planting when the soil is moist, but not wet, and by the selection of adaptable species. There is a severe windthrow hazard because the water table limits the development of an anchoring root system. By keeping thinning to a minimum, and planting shallow rooted species, the manager can minimize windthrow.

The main limitations if this soil is used as a site for dwellings are ponding and the high shrink-swell potential of the clayey substratum. A better suited site should be considered such as a higher area in the map unit. If this soil is used, an extensive drainage system will be needed to control wetness.

The main limitations if this soil is used as a site for local roads and streets are ponding and a high shrink-swell potential in the substratum. Construction plans should call for providing coarser grained subgrade material. Adequate surface and subsurface drainage will also decrease wetness and instability.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, the slow permeability in the clayey substratum, and the sandy subsoil. A better suited site should be selected for this use.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and ponding. Digging operations will be restricted to summer unless drainage is provided. Sloughing of soil in the excavated area will also occur during months of the seasonal high water tables. Trench walls should be mechanically supported to prevent a possible collapse.

The capability subclass is 5w undrained and 3w drained.

181—Dorval muck

This soil is very deep, nearly level and very poorly drained. It formed in organic deposits in depressions. Small hummocks and bumps are prevalent across otherwise smooth terrain. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 17 inches, black muck

Subsurface:
17 to 23 inches, very dark gray muck
23 to 31 inches, dark brown mucky peat

Substratum:
31 to 72 inches, gray silty clay

Included with this soil mapping are about 10 percent Carbondale muck, which are deeper than 51 inches to mineral soil. These are often near the center of the map unit. Where streams flow into this unit, small areas of Fluvaquents are included. In some places, areas of shallow to bedrock Summerville soils are included. Small areas of clayey Adjidaumo soils are included near the edges of some units. Also included on knolls and small ridges in some places are small areas of well drained, loamy Grenville soils. Included soils make up about 20 percent of this unit and range up to 5 acres.

Soil Properties

Permeability: moderate to moderately rapid in the surface and subsoil layers, and very slow in the substratum
Available water capacity (average for 40-inch profile): high
Depth to seasonal high water table: 12 inches above the surface to 12 inches below from November through May
Root zone: mostly the upper 12 inches
Shrink-swell potential: low in the organic surface and subsurface layers and high in the substratum
Depth to bedrock: greater than 60 inches

Almost all areas of this soil are in woodland or brush.This soil is not suited to cultivated crops unless the soil is drained. Outlets for drainage are difficult to develop because these soils are generally in the lowest areas of the landscape. Most of these soils are generally considered as important wetland areas.

This soil is poorly suited to pasture. Even if drained, this soil lacks the strength to support animals or farm machinery during wet periods of the year. Grazing when the soil is wet and overgrazing can be harmful to desirable forage species. Proper stocking rates, rotational grazing and restricting grazing to dry summer months are practices that may encourage the growth of desirable plant species.

The potential productivity for red maple on these soils is moderate. The seasonal high water table causes a severe seedling mortality rate. Selecting species tolerant of very wet soil conditions can improve timber production. The shallow root zone in this soil allows for trees to blow over easily. Keeping thinning to a minimum helps reduce this severe windthrow hazard. The soil is soft and unstable when wet, and will not support heavy logging equipment. Logging during frozen ground conditions may alleviate this problem.

This soil is not suited as a site for building development because of ponding, low soil strength and excess humus. A better suited site such as nearby or included Grenville soils should be considered.

Potential subsidence, ponding of surface water, and potential frost action are severe limitations if this soil is used as a site for local roads and streets. Providing suitable subgrade material or special construction for adequate support will help avoid excessive subsidence and buckling of pavement. Constructing roads on raised fill material and installing a drainage system are ways to overcome the wetness limitation. Providing coarser grained subgrade material to frost depth will help prevent damage due to frost action. If possible, route road locations around these wet soils.

This soil is not suited as a site for septic tank absorption fields. It is subject to ponding, which may result in a pollution hazard if the soil is used as a filter field. The soil is also limited by a slow percolation rate in the clayey substratum.

The main limitations if this soil is used as a site for shallow excavations are ponding and excess organic material. Digging operations will likely be limited to dry periods of the year unless drainage is installed. Sloughing of soil in the excavated area will also likely occur because of wetness. Because of the high organic content, this soil will present great difficulty in maneuvering heavy machinery.

The capability subclass is 5w.

260C—Grenville loam, strongly sloping, very stony

This soil is very deep and well drained. It occurs on elongated ridges and side slopes of glacial till lowlands. Large stones cover up to 3 percent of the soil surface. Slopes range from 3 to 15 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, dark brown loam

Subsoil:
9 to 12 inches, brown loam
12 to 17 inches, dark yellowish brown loam

Substratum:
17 to 35 inches, brown gravelly fine sandy loam
35 to 72 inches, brown gravelly fine sandy loam with common mottles

Included with this soil in mapping are about 10 percent moderately well drained Hogansburg soils on footslopes and undulating areas. About 5 percent moderately deep Neckrock soils are included near areas of limestone rock outcrop. Small areas of somewhat poorly drained Malone soils are included near seep spots and slightly concave positions. Also, small areas of non-stony soils and moderately steep soils are included. In some areas, the surface texture is very cobbly fine sandy loam or extremely stony fine sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, subsoil, and upper substratum, and moderately slow in the lower substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: greater than 72 inches deep
Root zone: 24 inches deep or more
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this unit are in woodland. A few remaining areas are in unimproved pasture or brush.

This unit is poorly suited to growing cultivated crops and hay. The large surface stones inhibit efficient use of equipment and cause excessive wear on farm machinery. Erosion is a common problem particularly on long strongly sloping areas planted in row crops. Stone clearing, applying conservation tillage systems, rotating crops, stripcropping, and using cover crops are good management practices.

This unit is poorly suited to pasture. The large surface stones discourage some pasture management practices such as yearly mowing. Erosion may be a significant management problem on heavily grazed areas of this unit. Overgrazing should be avoided to reduce soil erosion and encourage key forage species. Stone clearing, rotational grazing, proper stocking rates, and yearly mowing are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. No major limitations exist for woodland management. However, windthrow can be a problem in included areas where seepage and less rooting depth occurs.

The main limitation if this soil is used as a site for dwellings is slope. The strongly sloping areas of this unit will require some grading and landscaping expenses. Design of the dwelling should conform to the natural slope to minimize costs.

The main limitations if this soil is used as a site for local roads and streets are frost action and the strongly sloping topography. Construction plans should call for providing coarser grained subgrade material to frost depth. Adequate surface drainage in critical areas will also decrease the potential for frost action. This unit will cost more for grading than adjacent nearly level and gently sloping soils.

The main limitation if this soil is used as a site for septic tank absorption fields is the moderately slow permeability rate in the substratum. A better suited site should be considered for this use. An alternate system or specially designed septic tank absorption field needs to be considered for this soil to avoid seepage problems.

The main limitations if this soil is used as a site for shallow excavations are the dense substratum and slope. Excavation of soil material may be slower and somewhat more expensive than soils with friable layers. Maneuvering equipment may also be more difficult because of strongly sloping areas.

The capability subclass is 6s.

261B—Hogansburg loam, gently sloping, very stony

This soil is very deep and moderately well drained. It occurs on undulating glacial till lowlands. Large stones cover up to 3 percent of the soil surface. Slopes range from 0 to 8 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 10 inches, very dark grayish brown loam

Subsoil:
10 to 15 inches, brown loam
15 to 19 inches, dark yellowish brown fine sandy loam with few mottles

Substratum:
19 to 35 inches, brown gravelly loam with many mottles
35 to 72 inches, brown gravelly loam with few mottles

Included with this soil in mapping are about 5 percent well drained Grenville soils on slightly more convex positions and in areas near steep slopes. About 5 percent of this unit is somewhat poorly drained Malone soils on slightly concave or nearly level areas. Also included are soils similar to Neckrock soils with bedrock less than 60 inches deep. Small inclusions of similar soils occur in areas being slightly more acid in the subsoil and substratum. In some areas, the surface was not stony and texture is fine sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, subsoil, and upper substratum, and moderately slow in the lower substratum

Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 18 to 24 inches deep at some time during March through May
Root zone: mainly to 24 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is poorly suited to growing cultivated crops and hay. Tillage with convention farm equipment is impractical because of large surface stones resulting in substantial wear or damage to farm equipment. Stone removal will be necessary in most areas of this unit before cultivation. Conservation tillage systems, crop rotation, and the use of cover crops are good management practices.

This soil is moderately suited to pasture. The presence of large surface stones can negatively affect quality and quantity of forage and inhibit yearly mowing and other maintenance practices. Stone removal, rotational grazing, yearly mowing and proper stocking rates are good pasture management practices.

The potential productivity for growing sugar maple on this soil is moderate. There are no major limitations for woodland management on this soil. However, windthrow can be a problem in included areas where seepage and less rooting depth occurs.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as included Grenville soils or a higher nearby area. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Designing new roads with coarser grained subgrade material will help alleviate potential frost damage. Adequate surface and subsurface drainage in critical somewhat poorly drained areas will also decrease the potential for frost action.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability rate. A better suited site should be considered for this use. If this soil is used as a site for septic tank absorption fields, higher spots within the map unit would likely perform best. Conventional septic system designs may perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 6s.

263B—Malone gravelly loam, gently sloping, very stony

This soil is very deep and somewhat poorly drained. It occurs on slightly concave or undulating glacial till plains. Large stones cover up to 3 percent of the soil surface. Slopes range from 0 to 8 percent, but are dominantly 3 to 8 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, very dark grayish brown gravelly loam

Subsoil:
9 to 30 inches, brown gravelly fine sandy loam with many mottles

Substratum:
30 to 72 inches, grayish brown very gravelly sandy loam with few mottles

Included with this soil in mapping are about 5 percent moderately well drained Hogansburg soils on slightly higher positions. About 5 percent of this unit includes very poorly drained Runeberg soils along drainageways and in depressions. About 5 percent of this unit includes the somewhat poorly drained Coveytown soils where sandy surface and subsoil textures occur and the Muskellunge soils in slight depressions where clayey textures dominate. Also there are small inclusions of moderately deep Matoon soils as well as non-stony areas. In some areas, the surface texture is fine sandy loam or sandy loam. Included areas make up about 20 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, and moderately slow or slow in the subsoil and substratum
Available water capacity (average for 40-inch profile): moderate
Depth to seasonal high water table: perched 12 to 18 inches deep at some time from November through May
Root zone: mainly to 18 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are used as woodland or pastureland.

This soil is poorly suited to growing cultivated crops and hay. Large surface stones inhibit efficient use of farm machinery and cause serious wear and tear on equipment. The seasonal high water table can delay planting in the spring and harvest in the fall. Surface and subsurface drainage, however, can improve efficiency of farm operations and increase crop yield. Stone clearing, conservation tillage systems, crop rotation and maintenance of waterways are good management practices.

This soil is poorly suited to pasture. Large surface stones inhibit effective pasture management such as yearly mowing. The seasonal high water table can cause significant wetness in barn yards and heavily traveled areas of the pasture especially in the spring. Forage may show stunted growth during the early part of the growing season as a result of wetness. Stone clearing, deferred grazing, rotational grazing, proper stocking rates, surface drainage, and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. The seasonal high water table may cause soft ground conditions for heavy equipment, especially in the spring. Wetness may adversely affect root growth and seedling survival. There is a moderate windthrow hazard because of limited rooting depth. Harvesting during drier periods or during frozen ground conditions will increase equipment use efficiency. Managing species that are wetness-tolerant and minimizing thinning are good practices on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying it away from the dwelling.

The main limitation if this soil is used as a site for local roads and streets is frost action. Construction plans should specify providing coarser grained subgrade material. Adequate drainage in critical areas will also decrease the potential for frost action and seasonal wetness.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the moderately slow permeability. A better suited site should be considered for this use such as a soil with moderately rapid permeability. Conventional septic system designs will perform poorly on this soil. Alternative systems that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness.

The capability subclass is 6s.

264—Runeberg mucky loam, very stony

This soil is very deep, nearly level, and very poorly drained. It is in low positions on glacial till plains. Large stones cover up to 3 percent of the soil surface. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 9 inches, black mucky loam

Subsoil:
9 to 17 inches, brown cobbly loam with many mottles
17 to 22 inches, dark grayish brown sandy loam with common mottles

Substratum:
22 to 42 inches, grayish brown fine sandy loam with many mottles
42 to 72 inches, grayish brown gravelly fine sandy loam with few mottles

Included with this soil in mapping are about 5 percent somewhat poorly drained Malone soils on slightly higher areas of the unit. About 5 percent of this unit consists of very poorly drained Wonsqueak soils in small depressions where organic matter is thicker. Small areas of clayey Adjidaumo soils are included where the soil is more clayey. Small areas of very poorly drained soils are included where a sandy surface and subsoil is present. Non-stony areas are also included. In some areas, the substratum is very gravelly or very cobbly. Included areas make up about 15 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderate in the surface, moderately slow in the subsoil, and slow or moderately slow in the substratum
Available water capacity (average for 40-inch profile): moderate to high
Depth to seasonal high water table: at the surface to 12 inches deep at some time from November through July

Root zone: mainly to 12 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland or brushland.

This soil is poorly suited to growing cultivated crops and hay. The presence of large stones impedes efficiency and damages machinery. Without adequate drainage, the seasonal high water table delays planting in the spring and harvest in the fall. Surface and subsurface drainage can significantly improve the efficiency of farm operations and increase productivity. Because of the low position and nearly level topography, establishing a drainage outlet for this soil can be difficult without adversely affecting important wetland. Conservation tillage systems, crop rotation, and maintenance of drainageways are good management practices.

This soil is poorly suited to pasture. The seasonal high water table causes the soil to be wet during most of the spring and fall. Selecting forage plants which are tolerant to wet soil conditions will help sustain productivity. Excessive grazing on this soil during the spring causes compaction and loss of forage cover. Stone removal will be needed to maintain high quality forage and pasture maintenance. Rotational grazing, deferred grazing, proper stocking rates, maintenance of drainageways, and yearly mowing are good management practices.

The potential productivity for growing northern white cedar on this soil is moderately high. Because of the seasonal high water table, heavy equipment will commonly cause deep ruts and harvesting inefficiency. Harvesting operations tend to run smoother on this soil during dry or frozen periods. Wet soil conditions can retard root growth and seedling survival, and may cause severe windthrow in areas of this soil. Selecting species that are wetness-tolerant will help increase seedling survival and reduce windthrow. Minimizing thinning practices can also decrease windthrow.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. Better drained nearby soils should be considered for this use.

The main limitations if this soil is used as a site for local roads and streets are frost action and the seasonal high water table. New roads should be routed around this unit if possible. Roads placed on a raised bed of coarse grained material with adequate drainage will reduce frost action and soil-water problems.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table and the slow percolation rate in the substratum. There is a risk of groundwater pollution or effluent seeping to the ground surface if this soil is used. A better suited site on a higher landscape position should be considered for this use. Conventional septic system designs will perform very poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitation if this soil is used as a site for shallow excavations is the seasonal high water table. Digging operations will be limited to the drier periods of the year unless drainage is installed. Sloughing trench walls may also occur because of wetness.

The capability subclass is 5s.

270B—Coveytown loamy sand, gently sloping, very stony

This soil is very deep and somewhat poorly drained. It occurs at the base of ridges and in concave areas of glacial till deposits that have been modified by both wave action and deposition of sands. Large stones cover up to 3 percent of the surface. Slopes range from 0 to 8 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface:
0 to 8 inches, very dark grayish brown loamy sand

Subsoil:
8 to 10 inches, yellowish brown and very dark grayish brown sand
10 to 17 inches, light yellowish brown sand with common mottles
17 to 28 inches, light brownish gray and pale brown sand with common mottles

Substratum:
28 to 48 inches, dark grayish brown gravelly fine sandy loam with many mottles
48 to 72 inches, grayish brown gravelly sandy loam with common mottles

Included with this soil in mapping are about 5 percent very poorly drained Runeberg soils and soils similar to Coveytown occurring in depressions. About 5 percent moderately well drained Fahey soils are included on more convex areas of the landscape. About 5 percent somewhat poorly drained Malone soils occur in areas where the sandy mantle is thin or absent. Also included are small areas of somewhat poorly drained Sciota and Wainola soils in places where the sandy mantle is thicker than 40 inches.

Small areas of similar soil having a clayey substratum and small areas of non-stony soils are also included. In some areas the surface texture is loamy fine sand and cobbly loamy fine sand. Included areas make up about 25 percent of this unit and range up to 5 acres each.

Soil Properties

Permeability: moderately rapid or rapid in the surface and subsoil, and moderate or moderately slow in the substratum
Available water capacity (average for 40-inch profile): very low or low
Depth to seasonal high water table: 12 to 18 inches below the surface at some time during November through May
Root zone: mainly to 16 inches deep
Shrink-swell potential: low
Depth to bedrock: greater than 60 inches

Most areas of this soil are in woodland or pastureland.

This soil is poorly suited to growing cultivated crops and hay. Because of many large surface stones, farm equipment use is seriously limited and subject to excessive wear and tear. The seasonal high water table can delay planting in the spring. Stone clearing, conservation tillage systems, crop rotation, and maintenance of waterways are good management practices on this soil.

This soil is poorly suited to pasture. Because of many large surface stones, good pasture maintenance such as yearly mowing is difficult to achieve unless stone clearing takes place. The seasonal high water table can cause significant wetness problems in barn yards and heavily traveled areas of the pasture, especially in the spring. Forage plant growth may be stunted during the early part of the growing season as a result of wetness. Stone clearing, rotational grazing, proper stocking rates, maintaining drainageways, and yearly mowing are good management practices.

The potential productivity for growing red maple on this soil is moderate. Because of the seasonal high water table, soft ground conditions may limit the use of heavy harvesting equipment to drier periods of the year. Seedling mortality and windthrow are considered moderate management concerns on this soil because of restricted root growth, especially in areas of poorly drained inclusions. Managing wetness-tolerant species and minimizing thinning are good practices on this soil.

The main limitation if this soil is used as a site for dwellings is the seasonal high water table. A better suited site should be considered such as a higher area in the map unit. If this soil is used, foundation drains and protective coatings on basement walls will help alleviate some wetness. Diversion ditches can also control surface water by carrying water away from the dwelling.

Moderate limitations of this soil for local roads and streets are the seasonal high water table and frost action. Roads constructed on raised coarse grained fill material with adequate drainage installed will generally require less maintenance costs in the long-term.

The main limitations if this soil is used as a site for septic tank absorption fields are the seasonal high water table, the moderately slow permeability in the substratum, and the poor ability to filter effluent properly in the upper part of the soil. A better suited site should be considered for this use. Conventional septic system designs will perform poorly on this soil. Alternative designs that augment the filtering capacity of this system should be considered.

The main limitations if this soil is used as a site for shallow excavations are the seasonal high water table and the tendency of the soil to cave in. Digging operations may be restricted to the drier periods of the year unless drainage is installed. Sloughing of soil in the excavated area may also occur because of wetness. The banks of the excavation should be mechanically supported to avoid the possibility of soil caving in on workers or other victims.

The capability subclass is 6s.

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 forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

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

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

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are verbal.

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, slightly limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately well suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Crops and Pasture

This section was developed with assistance from the Akwesasne Local Work Group, Les Benedict, Assistant Director of the Environmental Division; and Pat Sullivan, NRCS District Conservationist.

There are presently 12 farms on Akwesasne engaged in meat production (mainly for local consumption). These farms are family owned and operated. Cultivated crops are grown on a very limited basis, primarily in connection with subsistence gardens. Although hay production is important at Akwesasne, hay quality and quantity are generally limited to 2 or less cuttings per year because of the seasonal high water table in most fields.

The acreage in crops and pasture has declined in the last few decades due to residential and commercial development, economic trends and idling. Pastures are fenced primarily along property lines with livestock foraging through meadows, wetlands, and woodlands. These areas of pasture make up about 10 percent of Akwesasne.

Poor drainage is the major limitation of soils used at Akwesasne for agricultural production. For about 90 percent of the cropland and pasture acres, excessive soil wetness is a major management concern. Forty-four percent of Akwesasne is hydric soil.

The removal of excess water from the soil increases the productivity of farmland. Most soils with drainage limitations do not become dry enough to sow until late in the planting season. It has been shown that late planting of corn reduces yields about one bushel per day after mid-May. A well designed and maintained drainage system allows for timelier field management, and reduces soil compaction, excess water stress, and denitrification losses. The longevity of legumes such as alfalfa in a forage crop is generally reduced in wetter soils. Improved soil drainage can improve crop quality, as well as quantity. Overall, yields of commonly grown crops on artificially drained soils are higher than on naturally drained soils.

Some soils are either saturated with water or exhibit surface water ponding during the growing season. Production of crops is generally not possible on these poorly drained or very poorly drained soils without extensive drainage improvements. Drainage outlets are usually difficult to design without affecting valuable wetland areas. Examples of poorly drained or very poorly drained soils are Adjidaumo, Runeberg, and Pinconning soils.

Surface drainage practices such as land smoothing and the construction of drainage outlets and field ditches may be effective on soils such as somewhat poorly drained Muskellunge and Malone soils.

Subsurface drainage systems involve the installation of corrugated plastic drainage tubing in either a random or pattern design. The most appropriate design varies with the soil type and structure as well as the crops being grown. Random drainage systems are effective on somewhat poorly drained soils such as Hailesboro and Malone soils. Some areas of sloping soils such as moderately well drained Hogansburg soils contain wet spots or seeps. Drainage on these soils can be improved by installing random drains to intercept subsurface seepage.

Pattern drainage systems are effective on nearly level, poorly drained or somewhat poorly drained soils like Adjidaumo, Malone, and Muskellunge. The spacing of drain lines in a pattern system is determined by the permeability of the soil and the crop being grown. Drains must be more closely spaced in slowly permeable soils such as silty clay loam or clay. Establishing drainage outlets is sometimes difficult and expensive because of the low position of these soils on the landscape.

Information and technical assistance on drainage systems is available at the Franklin County Soil and Water Conservation District office.

Surface stones, boulders, and bedrock outcrops limit the use of some soils for crops and pasture. They interfere with the operation of tillage, planting, and harvesting equipment. Soils of the Neckrock-Summerville complex are examples of shallow to bedrock (or bedrock outcrop) areas that limit the management of land for crops or pasture. Grenville, Hogansburg, and Malone are the principle soils that are stony enough to interfere with the operation of tillage equipment.

Erosion is a hazard on some sloping areas of Akwesasne. The rate of erosion is related to the length and percent of slope, the soil type and texture, the amount and intensity of the rainfall, and the type and density of vegetative cover. Heuvelton, Muskellunge, and Nicholville soils on greater than 3 percent slopes have the potential for high rates of soil erosion when under regular cultivation.

Limiting the number of years of tillage in a corn-hay rotation can resolve the majority of erosion problems on a typical farm. Contour farming, no-till and conservation tillage practices help to reduce erosion on sloping soils with adequate drainage. A local representative of the Natural Resources Conservation Service or the Franklin County Soil and Water Conservation District can assist in planning an effective combination of practices to reduce soil erosion.

Soil tilth is an important factor in the emergence of seedlings, the infiltration of water, and the ease of cultivation. Soils with good tilth usually have granular structure and are porous. Organic matter is usually important in maintaining good soil tilth. Excessive tillage tends to reduce the organic matter content and breaks down soil structure. Some very deep, well drained or excessively drained, coarse texture soils, such as Adams and Flackville, can be tilled with little or no damage to tilth. However, wetter, fine textured and moderately fine textured soils—for example, Heuvelton, Muskellunge, and Hailesboro soils—must be tilled at the proper moisture content to prevent deterioration of the natural soil structure. Plowing or cultivating these soils under wet conditions causes puddling, and when too dry, results in surface crusting and clodding.

Fertility in soils is enhanced by lime and fertilizer. The amount needed depends on the natural content of lime and plant nutrients, the needs of the particular crop, and the level of desired yield. The organic matter content of the soil is one measure of fertility. The content in the surface layer of the soils at Akwesasne averages about 4 to 5 percent by volume as compared to a state average of about 3 percent. Poorly drained and very poorly drained soils, such as Adjidaumo and Runeberg, have a somewhat higher organic matter content.

For the complex forms of soil organic nitrogen to be made available to plants, the organic matter must be decomposed or mineralized by microorganisms. Nitrogen fertilizer may be needed to supplement the nitrogen normally mineralized from the soil organic matter for high nitrogen requiring crops such as corn. Management that builds up the supply of organic matter, such as the use of animal manure, green-manure crops, sod crops, and crop residue, maintains or improves the natural nitrogen content (Cornell Cooperative Extension Service, 1978).

Timeliness of nitrogen fertilization is important for maximum utilization by plants. Nitrogen can be lost through leaching in rapidly permeable soils, such as Waddington, or by denitrification in wetter and less permeable soils, such as Muskellunge. Best results are obtained when small amounts of nitrogen are applied at timely intervals; for example, at planting and then as a side dressing for corn while the crop is growing.

The soils of Akwesasne are generally low in natural phosphorus. Coarse textured Adams soils, for example, are very low in native phosphorus. The addition of appropriate amounts of phosphate in the form of commercial fertilizer may be essential for good plant growth.

Most of the soils have a low to medium level of available potassium; but, such soils as Muskellunge and Adjidaumo soils, which have clayey subsoil, may be somewhat higher in available potassium content. Even soils that have a fairly high content of potassium, however, may require additional potassium for optimum yields of most crops because of the slow release of potassium from the clay minerals.

Lime is needed in many of the soils of this region to raise the topsoil pH to an acceptable level for optimum yields of most crops.

Additions of lime and fertilizer should be based on soil tests. For assistance in obtaining soil tests and recommendations, farmers, gardeners, and others should consult the local Cornell Cooperative Extension Agent. New research findings and fertilizer recommendations are available in the current edition of “Cornell Recommends for Field Crops,” prepared by the staff of the New York College of Agriculture, Cornell University. In the absence of soil tests, these references, along with this publication, can be used as a guide in estimating the lime and fertility needs.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army

Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (USDA, 1999) and “Keys to Soil Taxonomy” (USDA, 1994) and in the “Soil Survey Manual” (USDA, 1993).

If soils are wet enough for long enough periods to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

5—Fluvaquents–Udifluvents complex, frequently flooded
42—Adjidaumo silty clay
43—Adjidaumo mucky silty clay
46—Deinache fine sand
49—Munuscong mucky fine sandy loam
51—Wegatchie silt loam
64—Runeberg mucky loam
70—Guff silty clay loam
101—Wonsqueak muck
110—Borosaprists and Fluvaquents, frequently flooded
148—Stockholm loamy fine sand
149—Pinconning mucky loamy fine sand
181—Dorval muck
264—Runeberg mucky loam, very stony

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Small Fruits Production

Table 7 was developed to provide guidance to the St. Regis Mohawk people on the relative capability of soils to produce small fruit. The soil properties selected for generating this table are those that are important to good strawberry and raspberry production. However, other small fruits (including corn and squash), fruit trees, flowers and many vegetables have similar preferences for soil conditions. Table 7 is meant as a guide to help the user compare one soil map unit with other map units, in order to make sound decisions. For detailed advice on plant needs, contact your Cornell Cooperative Extension office.

The soil properties chosen for rating the soils at Akwesasne for small fruit are soil drainage, texture, reaction, depth to bedrock, and surface stoniness. Overall ratings and individual soil property ratings are given in values between 0 and 1, representing poor to favorable conditions respectively. A map unit can have an overall *favorable* rating, and yet, be rated only *fair* or *poor* in one of the soil properties (i.e. texture). The opposite scenario can also occur. It is important to read all ratings for each map unit in context with past and present management practices. For example, a rating of *poor* soil drainage is not as important if the affected area has been artificially drained with ditches or tile.

Most small fruit species grow and produce their best in well and moderately well drained landscapes. In more droughty excessively drained areas, soil moisture may not be adequate during most years. On the other hand, raspberries and strawberries do not tolerate wet soil conditions because their roots are concentrated in the upper 50 cm (20 inches) of soil. Poorly drained and very poorly drained soils are rated zero.

Soil texture was rated by the percent clay within the top 50 cm (12 inches) of soil for developing table 7. An ideal texture of loam or fine sandy loam will have clay content in the 10 to 15 percent by volume range. Soil with less clay will have weaker soil structure and less available water capacity. Heavy soils, with higher clay content, tend to limit deep root growth because of greater bulk density and slower permeability.

Soil reaction or the pH level of the soil is important because it has a profound influence on the availability of essential nutrients to plant root systems. According to Cornell Cooperative Extension, most small fruits do best within a pH range of 6.0 to 6.5. Above or below this range, certain nutrients, such as iron, become either unavailable or toxic in some cases. An exception is the blueberry plant which requires a pH of about 4.5 for good production. Table 7 rates common fruits grown in the St. Lawrence River Valley that require higher pH values than blueberries.

Shallow depth to bedrock and surface stoniness are soil properties that negatively affect management and available water capacity. Soils less than 50 cm (20 inches) deep are root limiting and capable of storing less moisture for summer months, for example, Summerville soils. Stony soils impede planting, cultivation, and transplanting activities, and therefore, are given a lower rating than non-stony map units.

Forestland Management and Productivity

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In the table, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to manage are those that are suitable for commercial wood production.

Woodland Capability, Productivity and Management

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The portion of the Tribal Lands located south of the US-Canada border are contained within Major Land Resource Area 142 (the St. Lawrence-Champlain Plain). The Forest Service Ecoregion Province for the area is 211 (mixed deciduous-coniferous forest), and the Ecological Unit is 212Ea (St. Lawrence Glacial Marine Plain). These descriptions of the region provide a framework of a forest cover type on soils with both marine and glacial influences. The Wisconsin Glacial activity was followed by coverage from the Champlain Sea. The underlying bedrock is limestone and some sandstone with soils influenced to higher or lower pH respectively. The landscape of the Tribal Land has minor relief, and is drained and dominated by the St. Lawrence River.

The Tribal Lands, after the Champlain Sea retreated, were dominated by climax forest prior to the influence of man. Forest ecosystems tend to concentrate the nutrients, carbon, and energy in the standing wood biomass. Extensive farming activity in the area reduced the forest cover to less than 25 percent by 1950, but in recent decades marginal pasture and cropland has been reverting to brush or woodlots. Farming has imported nutrients to the area. Specific information is not available on the species distribution and the current acreage in trees for units below the county level in size.

Quality forest management is important to the health of the ecosystem of the region. Care should be taken to protect the resources with long term planning for forest utilization, considering the primary and secondary products of importance to the Tribe. Plants of cultural significance include black (brown) ash, sweetgrass, and herbal medicinals such as goldenseal and black and blue cohosh. There are undoubtedly others to consider as well. Forest and other land management plans need to address the maintenance and increase of these important forest plants. In some instances the effect on the understory plants from overstory disturbance may not be fully understood and additional knowledge may need to be generated.

Black (brown) ash is significant due to the use of the wood for basket making, a traditional craft. The current status of the tree is not good due to the previous use of the better known stands of this tree. Black ash (*Fraxinus nigra* Marsh.) grows in very specific habitats defined mostly by the soil type and drainage classification. Peat soils, fine sands, sands and loams with high water tables are required for successful growth of the species. Bogs, stream corridors, and poorly drained depressions are typical sites. Red maple, American elm, and northern white cedar are three companion species often found with black ash, and these may have generally faster rates of growth. Management of these species is likely to be key to the success of natural or artificial black ash regeneration on preferred sites.

The soils of the Tribal Lands which are suitable for forestry are shown in table 8. Woodland mangers should use the information in the table for planning purposes. Habitats for plants of cultural significance occur on smaller scales than the five acre soil mapping size, so the soil delineations are guides to likely habitat only. An inventory on likely soils should be carried out to generate the current status of important plants. Those soils with the same ordination symbol can be grouped for similar management and potential productivity.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. in the ratings. But also important in evaluating a site are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as *slight*, *moderate*, or *severe*. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 11 and interpretations for septic tank absorption fields in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

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 estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Engineering Properties of Geologic Deposits

This section was prepared by the staff of the Soil Mechanics Bureau of the New York State Department of Transportation.

The following geologic deposits occur in this area: glacial till, ice-contact deposits, outwash, deltaic, beach ridge, lacustrine, marine, alluvial, and organic. The engineering significance of each geologic deposit is influenced to a great extent by its mode of deposition, which, in turn, determines the texture of the material and the internal structure of the landform. Other influences are the position of the deposit in the landscape and position of the water table. The geologic deposits are divided into the following categories: deep till deposits; shallow-to-rock deposits; stratified coarse-grained deposits; stratified fine-grained deposits; and organic deposits.

Deep Till Deposits

Deep till deposits are unstratified, highly variable mixtures of all particle sizes ranging from rock fragments to clay. This material was scoured and transported from nearby sources by glacial ice and deposited as ground moraine, and lateral or recessional moraine. Bedrock is usually greater than five feet beneath the soil surface; but, in some small areas, this depth may be less or a few rock outcrops may occur. The individual rock and mineral fragments in the soil generally reflect the types of bedrock in the vicinity.

Soils formed in glacial till deposits are those of the Grenville, Hogansburg, Malone, and Runeberg series. The Coveytown and Fahey series have a veneer of coarse-grained material over deep glacial till.

Most of glacial till soils have been subjected to the compactive weight of overriding continental ice sheet. Deep till and residual soils are on slopes ranging from nearly level to strongly sloping. Many landscapes are such that cut and fill earthwork is involved in most construction. The soils usually provide stable, relatively incompressible foundations for engineering works. Fill material from these deposits, when properly compacted, generally provide stable embankments. Steep cut slopes often are subject to surface sloughing and soil erosion. The Runeberg series are subject to surface saturation or ponding.

Shallow-to-Rock Deposits

Shallow-to-rock deposits are usually from 0.5 to 4 feet thick with some rock outcrops. The landforms and topography are generally controlled by bedrock. Soils formed in shallow-to-rock deposits are those of the Guff, Matoon, Neckrock, and Summerville series. Guff and Matoon soils are fine grained deposits over limestone bedrock. Neckrock and Summerville series have till deposits over the rock.

The primary engineering concerns relate to the underlying bedrock and groundwater conditions. The overlying material has engineering characteristics as described in other sections. It is limited in quantity as a source of fill material because of its thickness over bedrock.

Stratified Coarse-Grained Deposits

Stratified coarse-grained deposits can be divided into two general categories; gravel and sand sorted by glacial melt water into layered or stratified deposits, and coarser materials deposited by fluvial action. They occupy such geologic landforms as outwash plains and terraces, beach ridges and the coarse-grained portions of deltas, lacustrine plains, alluvial fans and floodplains. The strata within these deposits may be well sorted or poorly sorted, and consist of particle sizes ranging from cobbles to silt. The deposits are usually loose, porous, and have moderately rapid to rapid permeability.

Soils formed in the stratified coarse-grained deposits are those of the Adams, Croghan, Deinache, Lovewell, Sciota, and Waddington.

Coarse-grained deposits generally have relatively high soil strength and low compressibility, but are subject to settlement when vibrated. Because of their loose and porous nature, most of these deposits are not highly erodible. The Lovewell series has fine-grain material over coarse material. The Deinache series are subject to saturation at the surface. Also, the Lovewell series is subject to occasional flooding.

These deposits of gravel and sand have many uses as a construction material. Depending on gradation, soundless, and plasticity, they may be used for such purposes as:

1. Fill material for highway embankments.
2. Fill material for parking areas and developments.
3. Fill material to distribute stress on underlying soils so construction operations may progress.
4. Sub-base for pavements.
5. Wearing surfaces for driveways, parking lots, and some roads.
6. Material for highway shoulders.
7. Free draining backfill for structures and pipes.
8. Outside shells of dams for impounding water.
9. Slope protection blankets to drain and help stabilize wet cut slopes.
10. Sources of sand and gravel for general use.

Stratified Fine-Grained Deposits

Deposits in this category, consist of mainly lacustrine fine-grained sediment transported by glacial melt waters and deposited in quiet proglacial lakes and ponds, or consist of marine sediments.

Soils formed in stratified fine-grain deposits are those of the Adjidaumo, Deinache, Elmwood, Flackville, Hailesboro, Heuvelton, Mino, Muskellunge, Nicholville, Pinconning, Roundabout, and Swanton series. Soils formed in deep marine or lacustrine silt and clay deposits are those of the Adjidaumo, Hailesboro, Heuvelton, and Muskellunge series. The Elmwood and Swanton soils formed in a veneer of moderately coarse-grained material over fine-grained sediments. The Mino, Nicholville, and Roundabout series formed in deep silt or very fine sand areas of lake plains.

Due to their fine-texture and high moisture content, these deposits have low soil strengths, are compressible, and may settle for long periods of time under a superimposed loading. The soils with a higher fine sand and silt content have low compressibility, and are highly erodible and frost susceptible.

The fine-grained deposits are difficult to use for engineering works, especially in areas that are flat, wet, and subject to ponding. Sites for embankments and heavy structures or buildings on all soils formed in these finer sediments must be investigated for strength and settlement characteristics, and the effects of groundwater.

Organic Deposits

Organic deposits for the most part are accumulations of plant remains. In places, they include a minimal amount of mineral soil. Typically, they occur in very poorly drained depressions or bogs which are covered with water during most of the year.

Soils formed in the organic deposits are those of the Borosaprists, Dorval, and Wonsqueak series. The soils in organic deposits are unsuitable for foundations for engineering works because they are wet, low in strength, and highly compressible.

Generally, the organic material should be removed down to the depth of suitable underlying material and replaced with suitable backfill. Filling over organic deposits causes long-term settlement. Dorval and Wonsqueak series are organic over fine-grained material.

Building Site Development

Table 11 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. It is assumed that foundations are built to the depth of maximum frost penetration to avoid heaving.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 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 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil.

The soils are rated *good*, *fair*, or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings. The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated fair are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, 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 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, *dikes*, and *levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction. The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties. Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and *diversions* are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. These results are reported in table 15.

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 are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 15 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-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 particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table R.

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 particle-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 generally omitted in the table.

Physical Properties

Table 16 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 16, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 16 as the K factor (Kw) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 17 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Soil Features

Table 18 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 19 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 19 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA, 1999) and in “Keys to Soil Taxonomy” (USDA, 1994). 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.

Adams Series

The Adams series consists of very deep, somewhat excessively drained and excessively drained soils on outwash plains, terraces, and deltas. These soils formed in glacial outwash sands. Slopes range from 0 to 70 percent.

Adams soils are associated in a drainage sequence with the moderately well drained Croghan soils, somewhat poorly drained Wainola soils, and poorly drained Deinache soils. The Adams soils are commonly adjacent to Monadnock, Becket, Colton and Tunbridge soils on the landscape. Adams soils have less silt and clay than the more loamy Monadnock and Becket soils. Adams soils have less rock fragments throughout the profile than Colton soils. Also, Adams soils are deeper to bedrock than the moderately deep Tunbridge soils.

Typical pedon of Adams loamy sand, 8 to 15 percent slopes, in the town of Saranac, Clinton County, about 0.7 miles west of the intersection of Picketts Corners Road and Nashville Road and about 0.15 miles south of the Nashville Road in a sand pit; USGS Dannemora topographic quadrangle, lat. 44 degrees 41 minutes 48 seconds N., and long. 73 degrees 44 minutes 21 seconds W., NAD27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loamy sand; numerous light brownish gray (10YR 6/2) sand grains in matrix; weak medium and fine granular structure; very friable; few coarse, common fine, and many very fine roots; 1 percent rock fragments; very strongly acid; abrupt smooth boundary.

E—7 to 9 inches; pinkish gray (7.5YR 6/2) sand; single grain; loose; common very fine roots; 1 percent rock fragments; strongly acid; abrupt wavy boundary.

Bhs—9 to 11 inches; dark reddish brown (5YR 3/3) loamy sand; weak fine granular structure; very friable except 30 percent firm nodules 1/2 inch in diameter; few very fine roots; 1 percent rock fragments; strongly acid; abrupt wavy boundary.

BS1—11 to 13 inches; dark brown (7.5YR 3/4) loamy sand; weak medium subangular blocky structure parting to weak fine granular; very friable; few very fine roots; 1 percent rock fragments; strongly acid; clear wavy boundary.

BS2—13 to 18 inches; strong brown (7.5YR 5/6) sand; weak medium and coarse subangular blocky structure; very friable; few very fine roots; 1 percent rock fragments; strongly acid; clear wavy boundary.

BC—18 to 27 inches; strong brown (10YR 5/6) sand; weak medium and coarse subangular blocky structure; very friable; few very fine roots; 2 percent rock fragments; moderately acid; clear smooth boundary.

C1—27 to 35 inches; yellowish brown (10YR 5/4) fine sand; weak medium platy structure breaking to single grain; friable; few very fine roots; 2 percent rock fragments; moderately acid; clear smooth boundary.

C2—35 to 72 inches; brown (10YR 5/3) sand; occasional lenses 1 to 2 mm. thick of grayish brown (10YR 5/2), strong brown (7.5YR 5/6), and brown (7.5YR 5/4) sand throughout matrix; single grain (except massive with weak thin and medium plate-like divisions in about 5 percent of horizon); loose (except friable in massive areas); 5 percent rock fragments; moderately acid.

The thickness of the solum ranges from 16 to 30 inches. Depth to bedrock is greater than 72 inches. Adams soils are typically free of rock fragments, but range from 0 to 5 percent gravel above 20 inches and from 0 to 20 percent gravel below 20 inches.

The O horizon, if present, is neutral or has hue of 5YR to 10YR, value of 2 or 3 and chroma of 0 or 1.

The Ap or A horizon has hue of 5YR to 10YR, value of 3 to 5 and chroma of 1 to 4. Texture is loamy fine sand, loamy sand, fine sand or sand in the fine earth fraction. Reaction is extremely acid to strongly acid.

The E horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 1 to 3. Texture is loamy fine sand, loamy sand, fine sand or sand in the fine earth fraction. Reaction is very strongly acid or strongly acid.

The Bhs has hue of 5YR to 10YR, value 2 or 3 and chroma of 1 to 4. Texture is loamy fine sand, loamy sand, fine sand or sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid. Some pedons have a Bh horizon.

The Bs horizons have hue of 5YR or 7.5YR, value of 3 to 6, and 3 to 8. Texture is loamy fine sand, loamy sand, fine sand or sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The BC horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. Texture ranges from fine sand to coarse sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The C horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 2 to 6. Texture ranges from fine sand to coarse sand in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

Adjidaumo Series

The Adjidaumo series consists of very deep, poorly drained and very poorly drained soils on glacial lake plains. These soils formed in water deposited clay and silt in a lake or marine environment. Slopes range from 0 to 3 percent.

The Adjidaumo soils are in a drainage sequence with the moderately well drained Heuvelton soils and the somewhat poorly drained Muskellunge soils. The Adjidaumo soils are commonly adjacent to Hailesboro, Roundabout, Swanton, Kalurah, Hogansburg, and Malone soils. Adjidaumo soils have a higher clay content throughout the profile than the Hailesboro and

Roundabout soils. Adjidaumo soils lack the loamy mantle over clay that is characteristic of Swanton soils. The clayey Adjidaumo soils generally lack the rock fragments commonly present in loamy Kalurah, Hogansburg, and Malone soils.

Typical pedon of Adjidaumo silty clay, in the town of Beekmantown, Clinton County, about 0.9 mile northeast of the intersection of Cemetery Road with Lake Shore Road, and about 0.5 mile north of Cemetery Road in a hayfield; USGS Beekmantown topographic quadrangle, lat. 44 degrees 48 minutes 15 seconds N., and long. 73 degrees 23 minutes 1 second W., NAD27:

Ap—0 to 7 inches, black (10YR 2/1) silty clay; strong medium granular structure; very friable; common very fine and fine roots; slightly acid; abrupt smooth boundary.

Bg1—7 to 10 inches, dark gray (10YR 4/1) silty clay; moderate fine angular blocky structure; friable; few very fine roots; common fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides mainly on faces of peds; neutral; clear smooth boundary.

Bg2—10 to 36 inches, dark gray (10YR 4/1) silty clay; moderate medium angular structure; friable; common medium distinct dark yellowish brown (10YR 4/4) masses of iron oxides mainly on faces of peds; slightly alkaline; gradual smooth boundary.

Cg—36 to 72 inches, grayish brown (10YR 5/2) silty clay; massive; friable; common medium faint yellowish brown (10YR 5/4) masses of iron oxides, and common medium faint gray (10YR 5/1) areas of iron depletion; slightly alkaline, very slightly effervescent.

The thickness of the solum ranges from 24 to 48 inches. Depth to carbonates ranges from 24 to 60 inches. Depth to bedrock is more than 60 inches. Rock fragments range from 0 to 2 percent by volume in the surface and subsoil, and from 0 to 10 percent in the substratum.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 0 to 2. It is silty clay, silty clay loam, or silt loam in the fine earth fraction. Reaction is slightly acid or neutral.

The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It is silty clay, silty clay loam, or clay in the fine earth fraction. Reaction is neutral or slightly alkaline.

The C horizon has hue of 10YR, 2.5Y, or is neutral, value of 3 to 5, and chroma of 0 to 3. It is silty clay loam, silty clay or clay in the fine earth fraction. Reaction is moderately alkaline or slightly alkaline.

Borosaprists

Borosaprists consist of very deep, very poorly drained soils formed in well decomposed plant matter on lake plains and in glacial till uplands. These soils are ponded with shallow water throughout most of the year. They are on low-lying landscape positions and on depressions adjacent to bodies of water. Some areas of this unit were created by beaver dams blocking drainageways. Slope is less than one percent.

Borosaprists are mapped in association with Fluvaquents which are formed in mineral soil deposits. Borosaprists commonly are near Bucksport, Adjidaumo, Loxley, Runeberg, and Sabattis soils on the landscape. Borosaprists and Fluvaquents are flooded or ponded most of the year compared to these associated soils which are either flooded for less time or not flooded at all.

Borosaprists are highly variable; therefore, a typical pedon is not provided. Borosaprists consist of organic material more than 16 inches thick over mineral soil deposits or bedrock. Bedrock is generally at a depth of more than 60 inches. Rock fragments are generally absent in the organic part, and range from 0 to 45 percent in the underlying mineral portion.

The organic soil layers have hue of 10YR to 5Y (or are neutral), value of 1 to 3, and chroma of 0 to 2. It is dominantly sapric material, but individual layers contain variable amounts of hemic and fibric material. Reaction ranges from very strongly acid to neutral.

The underlying mineral substratum has hue of 10YR to 5Y (or are neutral), value of 3 to 5, and chroma of 0 to 2. Texture ranges from sand to silty clay in the fine earth fraction. Reaction ranges from strongly acid to neutral.

Churchville Series

The Churchville series are very deep, somewhat poorly drained soils formed in silt and clay sediments overlying loamy glacial till. They are nearly level and gently sloping soils on lacustrine or marine plains intermingled with low ridges of glacial till. Slopes range from 0 to 8 percent (fig. 2).

The Churchville soils are on landscapes near the Grenville, Hogansburg, Malone, Muskellunge, and Adjidaumo soils. Churchville soils have a clayey mantle overlying the glacial till that is characteristic of Grenville, Hogansburg, and Malone soils. Churchville soils lack the clayey substratum of Muskellunge and Adjidaumo soils.

Typical pedon of Churchville silty clay loam, 3 to 8 percent slopes, in a hayfield on the St.Regis Mohawk

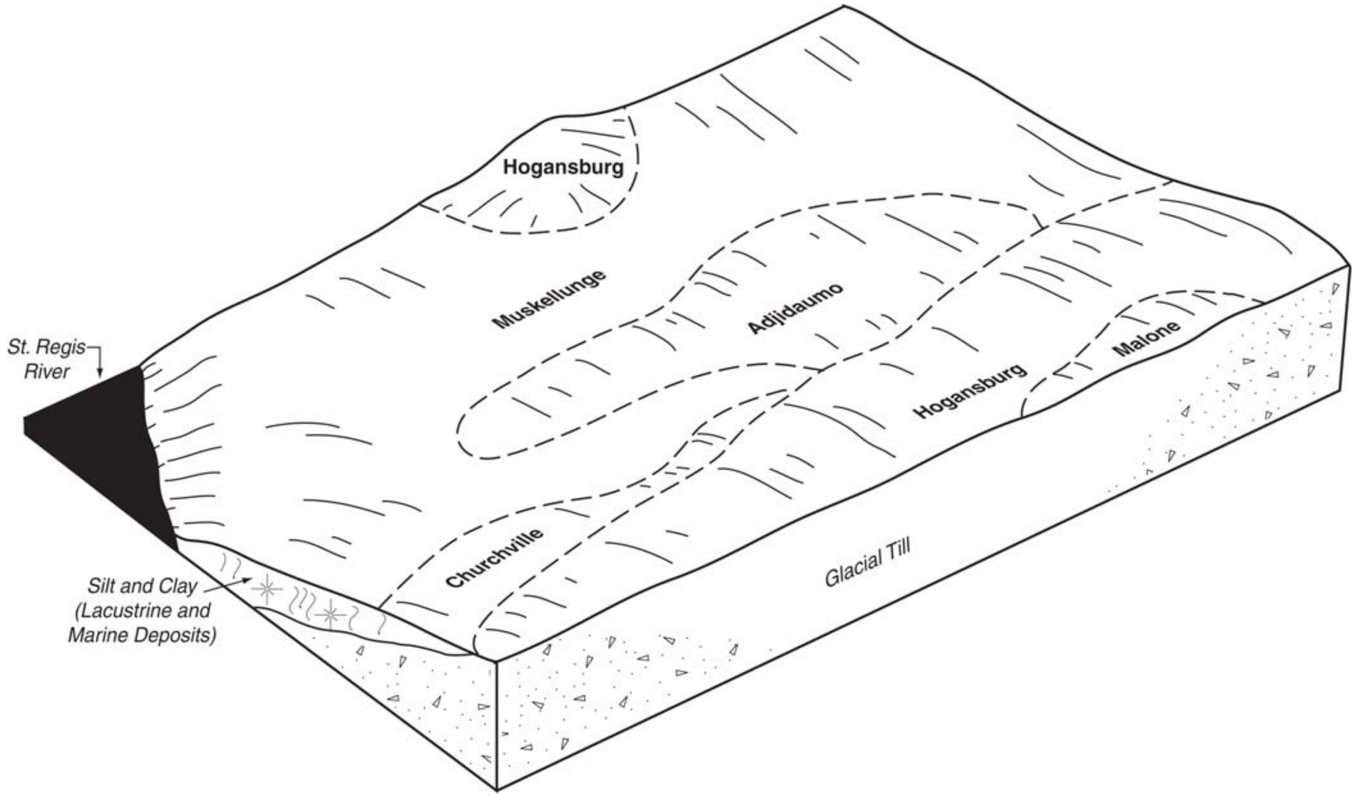

Figure 2.—Glacial till knolls and ridges of Hogansburg and Malone soils are separated by the more clayey, nearly level Adjidaumo and Muskellunge soils. These fairly fertile soils are used for agricultural purposes. However, the till soils tend to be stonier and more desirable for building sites. Churchville soils occupy a zone of transition between the till and clay soils.

Reservation in northern New York State, about 200 feet west of Beaver Road, and 800 feet south of NY Route 37 (Soil map 202D); USGS Bombay topographic quadrangle; lat. 49 degrees 57 minutes 56 seconds N., and long. 74 degrees 35 minutes 1 second W., NAD27 (fig. 3):

Ap—0 to 7 inches, very dark grayish brown (10YR 3/2) silty clay loam, light brownish gray (10YR 6/2) dry; moderate fine and very fine blocky structure; very friable; many very fine, and few fine and medium roots; many fine, medium, and very fine, and few coarse pores; 1 percent rock fragments; neutral; abrupt smooth boundary.

BE—7 to 11 inches, brown (10YR 5/3) silty clay loam, grayish brown (10YR 5/2) on face of peds; moderate fine and very fine blocky structure; friable; many very fine roots; common fine and medium, and few coarse pores; common fine and medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) soft masses mainly between peds; 2 percent rock fragments; slightly alkaline; clear wavy boundary.

Btg—11 to 19 inches, grayish brown (10YR 5/2) silty clay, gray (10YR 5/1) on face of peds; moderate fine blocky structure; firm; common very fine roots; common fine and medium, and few coarse pores; few fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) soft masses of iron oxide between peds and in matrix; common thin patchy oriented clay films on the face of peds, and moderate thick patchy clay flow in pores; 1 percent rock fragments; slightly alkaline; clear smooth boundary.

BC—19 to 22 inches, (60 percent) gray (10YR 5/1) silty clay and brown (10YR 5/3) silt loam; moderate thick and very thick varve-like structure; friable; few very fine roots; few fine and very fine pores, and few macropores caused by ant and earthworm activity; common medium distinct yellowish brown (10YR 5/6) soft masses of iron oxide; 1 percent rock fragments; slightly alkaline; abrupt smooth boundary.

2C1—22 to 25 inches, yellowish brown (10YR 5/4) cobbly loam; massive; friable; few very fine roots; few fine and very fine pores; many medium and coarse distinct yellowish brown (10YR 5/6 and 5/8) soft masses of iron oxide, and many coarse and medium distinct grayish brown (10YR 5/2) areas of iron depletion in matrix; 5 percent gravel

Figure 3.—A profile of Churchville silty clay loam with mottles or redoximorphic features in the area below the topsoil. The silty clay loam is underlain by the more gravelly or cobbly loam of glacial till origin.

and 5 percent cobbles; slightly alkaline; clear smooth boundary.

2C2—25 to 38 inches, brown (10YR 5/3) gravelly loam; massive with weak very thick and thick plate-like divisions; friable; few very fine pores; common medium distinct yellowish brown (10YR 5/6) soft masses of iron oxide, common fine distinct grayish brown (2.5Y 5/2) areas of iron depletion along fractures and face of plates, and few discontinuous gray (10YR 6/1) areas of iron depletion along cobbles accompanied by thin, soft, yellowish brown (10YR 5/6) rinds of iron oxide; 15 percent gravel, 9 percent cobbles, and 1 percent stones; slightly alkaline; slightly effervescent; clear wavy boundary.

2Cd—38 to 72 inches, light olive brown (2.5Y 5/3) gravelly fine sandy loam; massive with weak very thick plate-like divisions; firm; few very fine pores; common medium and fine distinct yellowish brown (10YR 5/6) soft masses of iron oxide along face of plates and in fractures; 15 percent gravel, 6 percent cobbles, and 4 percent stones; moderately alkaline; strongly effervescent.

The thickness of the solum and depth to the 2C horizon range from 20 to 40 inches. Depth to carbonates is 20 to 50 inches. Redoximorphic features consisting of concentrations of Fe/Mn oxides, or Fe depletions occur within 20 inches of the mineral surfaces. Depth to bedrock is greater than 60 inches. Volume of rock fragments, mostly gravel and cobbles, range from 0 to 10 percent in the solum and from 10 to 35 percent in the 2C horizon.

The Ap horizon has hue of 2.5Y to 7.5YR, moist value of 3 to 5, and dry value of 6 or 7, with chroma of 2 or 3. Texture ranges from fine sandy loam to silty clay loam in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The BE horizon has hue of 2.5Y to 7.5YR, value of 4 to 6, and chroma of 2 to 4 with common to many redoximorphic features. Texture is fine sandy loam to silty clay loam in the fine earth fraction. Reaction ranges from moderately acid to slightly alkaline.

The B/E horizon, if present, has ped coats similar in color and texture to the E horizon. Total thickness of the skeletons between adjoining peds is less than 5 mm, and less than 15 percent of the soil volume. Ped interiors (B portion) have color value of 4 or 5, and chroma of 2 to 4. In some pedons the BE or B/E horizon is replaced by an E/B horizon. Reaction ranges from slightly acid to slightly alkaline.

The B horizon has hue of 2.5Y to 7.5YR, value of 3 to 5, and chroma of 2 to 4. Ped coatings in the horizon have chroma of 2 or less. Redoximorphic features of high and low chroma are present. Texture is clay loam, silty clay loam, silty clay, or clay with a range in clay content from 35 to 55 percent by volume. Clay films range from patchy to continuous on faces of peds. Reaction ranges from slightly acid to slightly alkaline.

The BC horizon, if present, has hue of 2.5Y to 7.5YR, value of 3 to 5, and chroma of 2 to 4. Redoximorphic features are present. Texture is clay loam, silty clay loam, silty clay, or clay in the fine earth fraction. Reaction ranges from slightly acid to slightly alkaline.

The 2C horizon has hue of 2.5Y to 7.5YR, value of 3 to 5, and chroma of 1 to 4. Texture of the fine earth fraction is fine sandy loam, loam, silt loam or silty clay loam. Reaction is slightly or moderately alkaline.

Coveytown Series

The Coveytown series consists of very deep, somewhat poorly drained soils on footslopes of glacial lake beaches. These soils formed in glacial till deposits modified by both wave action and deposition of sands. Slopes range from 0 to 8 percent.

The Coveytown soils are in a drainage sequence with the moderately well drained Occur soils and the very poorly drained Cook soils. Coveytown soils are commonly adjacent to Malone, Runeberg, Sciota Trout River and Fahey soils on the landscape. The Coveytown soils have a sandy mantle at least 20 inches thick which is absent in the Malone and Runeberg soils. Coveytown soils have a loamy substratum within a 40-inch depth which is absent in the Sciota soils. The Coveytown soils have less rock fragments than Trout River and Fahey soils.

Typical pedon of Coveytown loamy sand, 0 to 3 percent slopes, in the town of Chazy, Clinton County, about 1,000 feet west of the railroad track crossing on Slosson Road, and about 600 feet north of Slosson Road in a field reverting to brush; USGS West Chazy topographic quadrangle, lat. 44 degrees 50 minutes 36 seconds N., and long. 73 degrees 30 minutes 15 seconds W., NAD27:

Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) loamy sand, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure to weak fine granular; very friable; many very fine and fine roots; 11 percent (including 1 percent cobbles); neutral (limed); clear smooth boundary.

BA—8 to 10 inches, 70 percent yellowish brown (10YR 5/4) and 30 percent very dark grayish brown (10YR 3/2) sand; weak fine and medium subangular blocky structure; friable; many very fine and fine roots; 5 percent rock fragments; neutral; clear wavy boundary.

Bw—10 to 17 inches, light yellowish brown (2.5Y 6/3) sand; weak medium and fine subangular blocky structure; very friable; many very fine and common fine roots; common coarse and medium distinct yellowish brown (10YR 5/6) masses of iron oxides and few fine distinct light brownish gray (10YR 6/2) areas of iron depletion; 6 percent rock fragments (including 1 percent cobbles); neutral; gradual wavy boundary.

Bg—17 to 28 inches, 70 percent light brownish gray (10YR 6/2) and 30 percent pale brown (10YR 6/3) sand; very weak thick platy structure; very friable; common fine and very fine roots; few coarse and medium distinct dark yellowish brown (10YR 4/4) and common coarse and medium distinct yellowish brown (10YR 5/6) masses of iron oxides; 5 percent rock fragments; neutral; clear wavy boundary.

2Cg1—28 to 48 inches, dark grayish brown (2.5Y 4/2) gravelly fine sandy loam, weak very coarse prismatic structure; friable (firm in place); few fine roots along faces of prisms; few fine and medium pores; gray (10YR 6/1) faces of prisms; many medium and fine distinct light olive brown (2.5Y 5/6) and common medium and coarse distinct yellowish brown (10YR 5/6) masses of iron oxides; 30 percent rock fragments (including 5 cobbles); neutral; gradual wavy boundary.

2Cg2—48 to 72 inches, grayish brown (2.5Y 5/2) gravelly sandy loam; weak very coarse prismatic structure; friable; few fine and medium pores; gray (10YR 6/1) faces of prisms; common fine distinct dark yellowish brown (10YR 4/6) masses of iron oxides; 35 percent rock fragments (including 5 cobbles); moderately alkaline; strongly effervescent.

The thickness of the solum ranges from 20 to 39 inches. Depth to carbonates is 30 to 80 inches. Depth to bedrock is greater than 60 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Rock fragments range from 5 to 35 percent by volume in the surface and subsoil, and from 25 to 35 percent in the substratum.

The A or Ap horizon has hues of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 to 3. Texture is fine sandy loam, loamy fine sand, loamy sand, or sand in the fine earth fraction. Reaction is strongly acid to slightly acid.

The BA horizon, if present, has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 4. Texture is loamy fine sand, loamy sand or sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The B horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4. It has faint or distinct redoximorphic features. Texture is loamy fine sand, loamy sand, or sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The BC horizon, if present, has a hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4. Texture is loamy fine sand, loamy sand, or sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The 2C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 6. Texture is loam, fine sandy loam, or sandy loam in the fine earth fraction. Reaction ranges from slightly acid to moderately alkaline.

Croghan Series

The Croghan series consists of very deep, moderately well drained soils on stream terraces, outwash plains, lake plains, and deltas. These soils formed in acid sandy deposits. Slopes range from 0 to 8 percent.

Croghan soils are in a drainage sequence with the somewhat excessively drained and excessively drained Adams soils, the somewhat poorly drained Wainola soils, and the poorly drained Deinache soils. Croghan soils are on landscapes near Flackville, Fahey, Occur, and Monadnock soils. Croghan soils lack the clayey substratum characteristic of Flackville soils. Croghan soils have less gravel in the surface and subsoil than Fahey soils. The Croghan soils do not have loamy substrata as in Occur soils. Croghan soils have less rock fragments, silt, and clay than Monadnock soils.

Typical pedon of Croghan loamy fine sand, 0 to 3 percent slope, in the town of Mooers, Clinton County, about 1,650 feet south of the intersection of LaValley Road with River Road and about 300 feet west of cornfield, in a wooded area; USGS Mooers topographic quadrangle, 44 degrees 56 minutes north Latitude and 73 degrees 31 minutes 32 seconds west Longitude, NAD27:

Oe—0 to 1 inch, black (5YR 2.5/1) moderately decomposed organic material; weak fine granular structure; very friable; many very fine and fine roots; extremely acid; abrupt smooth boundary.

A—1 to 3 inches, black (5YR 2.5/1) loamy fine sand; weak fine granular structure; very friable; many very fine and fine, and common medium roots; extremely acid; abrupt wavy boundary.

E—3 to 9 inches, pinkish gray (7.5YR 6/2) fine sand; few very dark gray (5YR 3/1) organic stains in the upper part; single grain; loose; common very fine and fine roots; very strongly acid; abrupt wavy boundary.

Bhs—9 to 11 inches, dark reddish brown (5YR 3/3) fine sand; weak thick platy structure; friable; few very fine and fine roots; strongly acid; clear wavy boundary.

Bs—11 to 16 inches, mixed reddish brown (2.5YR 4/4) and dark reddish brown (2.5YR 3/4) fine sand; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

BC—16 to 33 inches, brown (7.5YR 4/4) fine sand; single grain; loose; common fine and medium distinct strong brown (7.5YR 5/6) and few fine faint light brown (7.5YR 6/4) masses of iron oxides; strongly acid; clear wavy boundary.

C—33 to 72 inches, pinkish gray (7.5YR 6/2) fine sand; single grain; loose; many fine distinct strong brown (7.5YR 5/6) masses of iron oxides; moderately acid.

The thickness of the solum ranges from 20 to 50 inches. Depth to bedrock is greater than 60 inches. Redoximorphic features occur below the spodic horizon within 40 inches of the mineral soil surface. Rock fragments range from 0 to 5 percent by volume in the surface, and from 0 to 15 percent in the subsoil and substratum.

The O horizon has hue of 5YR to 10YR or it is neutral, with of 2 or 3 and chroma of 1 or 2.

The A horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 or 2. Texture is loamy fine sand to sand in the fine earth fraction. Reaction ranges from extremely acid to moderately acid.

The E horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is loamy fine sand to sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The Bhs horizon has hue of 2.5YR to 7.5YR, value and chroma of 3. Texture is loamy fine sand to sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The Bs horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. Texture is loamy fine sand to sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The BC horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. Texture is loamy fine sand to sand in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The C horizon has hue of 7.5YR to 5Y, value of 4 to 7, and chroma of 2 to 6. Texture is loamy sand, fine sand, sand, or coarse sand in the fine earth fraction. Thin strata of very fine sandy loam, fine sandy loam or loamy fine sand are present in some pedons below 40 inches deep. Reaction ranges from very strongly acid to moderately acid.

Deinache Series

The Deinache series consists of very deep, poorly drained soils that formed on nearly level sandy areas within lake plains. Slopes range from 0 to 3 percent.

The Deinache soils are in a drainage sequence with moderately well drained Mooers and the somewhat poorly drained Sciota soils. Deinache soils are also near the Wonsqueak, Wainola, Flackville, Pinconning, and Cook soils in the landscape. The Deinache soils lack the 16 to 51 inches of organic deposits over mineral soil that compose Wonsqueak soils. Deinache soils are slightly lower on the landscape than Wainola soils and lack spodic horizons. Deinache soils are deep sands whereas Flackville, Pinconning, and Cook soils have sands underlain by finer-textured deposits within a 40-inch depth.

Typical pedon of Deinache fine sand, in the town of Mooers, Clinton County, about 0.75 mile southeast of the junction of LaValley Road with Angelville Road and

4,000 feet south of LaValley Road in a cornfield; USGS Mooers topographic quadrangle, lat. 44 degrees 55 minutes 30 seconds N., and long. 73 degrees 31 minutes 30 seconds W., NAD27:

Ap—0 to 9 inches, very dark brown (10YR 2/2) fine sand; gray (10YR 5/1) dry; weak fine and medium subangular blocky structure parting to weak fine granular; very friable; many very fine, and common fine roots; strongly acid; abrupt smooth boundary.

Cg1—9 to 19 inches, grayish brown (10YR 5/2) fine sand; single grain; loose; few very fine roots; common medium and fine distinct yellowish brown (10YR 5/6) masses of iron oxides; neutral; clear smooth boundary.

Cg2—19 to 25 inches, light brownish gray (10YR 6/2) fine sand; massive; very friable; common medium and coarse distinct yellowish brown and dark yellowish brown (10YR 5/6 and 4/6) masses of iron oxides; slightly alkaline; clear smooth boundary.

Cg3—25 to 35 inches, light brownish gray (10YR 6/2) fine sand; massive; very friable; common medium and fine pores; few fine and medium yellowish brown (10YR 5/6) masses of iron oxides and common 1/4 inch to 1/2 inch vertical strong brown (7.5YR 4/6) and yellowish brown (10YR 5/6) streaks of iron oxides; slightly alkaline; abrupt smooth boundary.

Cg4—35 to 44 inches, dark gray (N 4/0) loamy fine sand; massive; very friable; few medium and fine pores; few medium and coarse distinct dark yellowish brown (10YR 4/6) streaks of iron oxides around pores; slightly alkaline, clear smooth boundary.

2Cg5—44 to 48 inches, very dark gray (N 3/0) loamy very fine sand; massive; very friable; few fine and very fine pores; few fine and medium distinct yellowish brown and dark yellowish brown (10YR 5/6 and 4/6) streaks and masses of iron oxides; slightly alkaline; clear smooth boundary.

2Cg6—48 to 64 inches, dark gray (N 4/0) very fine sandy loam; massive; very friable; slightly alkaline; clear smooth boundary.

2Cg7—64 to 72 inches, dark gray (N 4/0) silt loam; massive; friable; few fine pores; slightly alkaline; gradual smooth boundary.

Thickness of the solum ranges from 6 to 25 inches. Carbonates, if present, are below a depth of 50 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments are typically absent, but may range up to 2 percent by volume in the substratum.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The A horizon in uncultivated areas has value or chroma one-unit lower than an Ap horizon. Texture is fine sand, loamy fine sand, or fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The Bg horizon, if present, has hue of 10YR to 5Y (or is neutral), value of 4 to 6, and chroma of 0 to 2. Texture is fine sand or loamy fine sand in the fine earth fraction. Reaction is neutral to moderately alkaline.

The Cg and 2Cg horizons have hue of 10YR to 5Y (or are neutral), value of 3 to 6, and chroma of 0 to 2. Texture above a 40-inch depth is fine sand or loamy fine sand in the fine earth fraction. Below 40 inches, texture also includes loamy very fine sand, very fine sandy loam, and thin subhorizons (generally less than 10 inches) of silt loam. Reaction ranges from neutral to moderately alkaline.

Dorval Series

The Dorval series consists of very deep, very poorly drained soils formed in organic materials that are between 16 and 51 inches thick, overlying clayey mineral deposits. These soils are in depressions within lacustrine or marine plains. Slopes range from 0 to 2 percent.

Dorval soils are closely associated with the Carbondale soils, which are more than 51 inches deep over mineral material. Other associated soils include the Adjidaumo, Deinache, Munuscong, Runeberg, Summerville, and Swanton soils. Dorval soils lack mineral soil within 16 inches of the surface which is characteristic of Adjidaumo, Deinache, Munuscong, Runeberg, Summerville, and Swanton soils.

Typical pedon of Dorval muck, in the town of Lisbon, St. Lawrence County, about 300 feet south of a gravel pit which is 1/2 mile east of Five Mile Line Road, and 1/2 mile south of Nelson Road; USGS Sparrowhawk Point topographic quadrangle, lat. 44 degrees 45 minutes 16 seconds N., and long. 75 degrees 21 minutes 05 seconds W., NAD27:

Oa1—0 to 17 inches; Black (N 2/0) broken face, very dark gray (5YR 3/1) rubbed; sapric material; about 40 percent fibers, 10 percent rubbed; moderate fine and medium granular structure; very friable; woody and herbaceous fibers; few fine and very fine roots; neutral; clear wavy boundary.

Oa2—17 to 23 inches, very dark gray (5YR 3/1) broken face, dark reddish brown (5YR 3/2) rubbed sapric material; about 50 percent fibers, 10 percent rubbed; massive; friable; woody and herbaceous fibers; 2 percent woody fragments; neutral; clear wavy boundary.

Oe—23 to 31 inches; dark brown (7.5 YR 3/2) broken face; dark reddish brown (5 YR 3/2), rubbed, hemic material; about 90 percent fibers, 20 percent rubbed; massive; friable; woody and herbaceous fibers; 2 percent woody fragments; neutral; clear wavy boundary.

2Cg—31 to 72 inches, gray (5YR 5/1) silty clay; massive; slightly sticky, slightly plastic; neutral.

The depth to the clayey C horizon is commonly 24 to 42 inches, and ranges between 16 and 50 inches. The material above the C horizon is woody in some pedons while in other pedons it is herbaceous or mixed. Many pedons contain fragments of twigs, branches, or logs ranging from 1/8 to 5 inches in diameter, and make up to 15 percent of the volume. Rock fragments are usually absent in the substratum, but range to 5 percent by volume in some pedons.

The surface tier has hue of 5YR to 10YR or it is neutral, value of 2 or 3, and chroma of 0 to 2. Exclusive of loose surface litter or mosses, it is sapric or hemic material with an unrubbed fiber content that ranges from 20 to 50 percent. Reaction ranges from strongly acid to slightly alkaline.

The subsurface tier has colors similar to the surface tier. It is dominantly sapric material, but thin hemic layers are common. Unrubbed fiber content ranges from about 20 to 90 percent. Reaction ranges from strongly acid to slightly alkaline.

The C horizon has hue of 5Y to 5YR, value of 4 to 6, and chroma of 1 to 6. Texture is clay, silty clay, silty clay loam, or clay loam. Thin layers in some pedons have more sand or silt and less clay. Reaction ranges from slightly acid to moderately alkaline.

Elmwood Series

The Elmwood series consists of very deep, moderately well drained soils on ancient marine beds or lake plains. These soils formed in a loamy mantle of fine sand and silt overlying a substratum of lacustrine or marine silts and clays. Slopes range from 0 to 8 percent.

Elmwood soils are in a drainage sequence with the somewhat poorly drained Swanton soils and the very poorly drained Munuscong soils. They are also associated with Heuvelton, Muskellunge, Hailesboro, Stockholm, and Flackville soils. Heuvelton, Muskellunge, and Hailesboro soils lack a loamy mantle over the finer textured silts and clays. The mantle in Elmwood soils is not as sandy as that in Flackville and Stockholm soils.

Typical pedon of Elmwood fine sandy loam, 0 to 3 percent slopes, in a corn field, in the town of Oswegatchie, St. Lawrence County, about 2,000 feet west of County Route 6, and 1 mile south of the junction with NY Rt.37; USGS Ogdensburg East topographic quadrangle, lat. 44 degrees 40 minutes 07 seconds N., and long. 75 degrees 30 minutes 00 seconds W., NAD27:

Ap—0 to 6 inches, brown (7.5RY 4/4) fine sandy loam, weak fine and medium granular structure; very friable; many fine common medium roots; slightly acid; abrupt wavy boundary.

Bwl—6 to 9 inches, brown (7.5YR 5/4) to dark brown (7.5YR 4/4) fine sandy loam, weak moderate subangular blocky structure; very friable; common fine and medium roots; few fine and medium pores; slightly acid; clear wavy boundary.

Bw2—9 to 17 inches, yellowish brown (10YR 5/4) fine sandy loam; single grain; very friable; many fine and medium roots; slightly acid; clear wavy boundary.

Bw3—17 to 22 inches, brown (7.5YR 5/4) fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; few medium pores; common coarse prominent yellowish red (5YR 5/6) and reddish brown (5YR 4/4) soft masses of iron oxide, and common fine distinct pinkish gray (7.5YR 6/2) areas of iron depletion; slightly acid; clear wavy boundary.

BC—22 to 25 inches, yellowish brown (10YR 5/4) fine sandy loam; single grain; loose; few fine roots; few fine pores; few fine prominent strong brown (7.5YR 5/6) soft masses of iron oxide and few fine prominent pinkish gray (7.5YR 6/2) areas of iron depletion; slightly acid; clear wavy boundary.

2C—25 to 72 inches, dark brown (10YR 4/3) silty clay with brown to yellowish brown (10YR 5/6) interiors; moderate medium and thick platy parting to moderate fine blocky structure; firm, slightly sticky, slightly plastic (wet); few fine roots; common fine and medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) soft masses of iron oxide, and common fine and medium light brownish gray (10YR 6/2) areas of iron depletion; slightly alkaline, slightly effervescent in the lower part.

Depth to the underlying fine textured material ranges from 18 to 40 inches. Bedrock is greater than 60 inches deep. The coarse-loamy material has up to 3 percent rock fragments by volume.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Texture is very fine sandy loam, fine sandy loam, sandy loam or loam. Reaction ranges from very strongly acid to slightly acid.

The B horizons have hue of 5YR to 2.5YR, value of 3 to 5, and chroma of 3 to 6. Texture is fine sandy loam, sandy loam or loam (except thin layers of loamy sand or loamy fine sand are allowed). Reaction ranges from very strongly acid to slightly acid.

The E horizon, where present, has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. Texture is sandy loam, fine sandy loam, very fine sandy loam, or silt loam. Reaction ranges from very strongly acid to slightly acid.

The 2B2 horizon, if present, has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. Texture is clay loam, silty clay loam, and silty clay. Reaction ranges from moderately acid to slightly alkaline.

The 2C horizons have hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 or 3. Texture is silty clay loam, silty clay, clay loam, or clay, and some pedons have thin strata of sand to silt below a depth of 40 inches. Reaction ranges from moderately acid to slightly alkaline.

Fahey Series

The Fahey series consists of very deep, moderately well drained soils on glacial lake beaches and outwash plains. These soils formed in wave-worked glacial till and outwash sands and gravel. Slopes range from 0 to 8 percent.

Fahey soils are in a drainage sequence with somewhat poorly drained Coveytown soils and very poorly drained Cook soils. Fahey soils are commonly adjacent to the Kalurah, Hogansburg, Occur, Wainola, Colosse, and Trout River soils. The Fahey soils have more gravel and sand in the profile than the Kalurah and Hogansburg soils. Fahey soils have more gravel throughout the profile than the Occur and Wainola soils. Fahey soils have redoximorphic features in the lower subsoil whereas Colosse and Trout River soils do not.

Typical pedon of Fahey gravelly fine sandy loam, 3 to 8 percent slopes, loamy substratum, in the town of Mooers, Clinton County, about 1.0 mile east of Blackman Corners Road and 150 feet north of Eddy Road in a hayfield; USGS Altona topographic quadrangle, lat. 44 degrees 59 minutes 48 seconds N., and long. 73 degrees 38 minutes 4 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) gravelly fine sandy loam; grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; common medium, many fine and very fine roots; common medium, fine and very fine pores; 20 percent rock fragments (including 5 percent cobbles); strongly acid; abrupt smooth boundary.

Bs—9 to 18 inches, brown (7.5YR 4/4) very gravelly loamy fine sand; weak medium and fine subangular blocky structure; very friable; many fine and very fine roots; common medium, fine and very fine pores; 40 percent rock fragments (including 10 percent cobbles); strongly acid; clear wavy boundary.

BC—18 to 27 inches, dark yellowish brown (10YR 4/4) very gravelly loamy fine sand; weak fine subangular blocky structure; very friable; few fine and common very fine roots; common medium, fine and very fine pores; common fine distinct light brownish gray (10YR 6/2) areas of iron depletion and common fine distinct strong brown (7.5YR 5/6) soft masses of iron oxides in lower part; 45 percent rock fragments (including 10 percent cobbles); moderately acid; clear smooth boundary.

C—27 to 45 inches, brown (10YR 4/3) very gravelly sand; single grain; loose; many medium, common fine and very fine pores; common fine distinct light brownish gray (10YR 6/2) areas of iron depletion and common fine distinct strong brown (7.5YR 5/6) soft masses of iron oxides; 50 percent rock fragments (including 10 percent cobbles); slightly acid.

2C—45 to 72 inches, light olive brown (2.5Y 5/4) very gravelly silt loam; massive; friable; many fine and very fine pores; many medium distinct light brownish gray (2.5Y 6/2) and many fine distinct brown (10YR 5/3) areas of iron depletion; 55 percent rock fragments (including 15 percent cobbles); slightly acid.

Thickness of the solum ranges from 24 to 36 inches. The depth to loamy layers is more than 40 inches. Redoximorphic features occur within 30 inches of the mineral soil surface. Rock fragments range from 0 to 35 percent by volume in the surface layer, 20 to 50 percent in the subsoil, and 30 to 70 percent in the substratum. Rock fragments average more than 35 percent by volume at depths from 10 to 40 inches.

In undisturbed areas, the soil may have an Oe or Oa horizon.

The Ap horizon has hue of 5YR to 10YR, value of 2 to 4 and chroma of 1 to 3. It is loamy sand, loamy fine sand, or fine sandy loam in the fine earth fraction. Unless limed, reaction ranges from very strongly acid to moderately acid.

Some pedons have an E horizon.

The Bs horizon has hue of 7.5YR, value of 4 to 6, and chroma of 3 to 6. Texture is sand, loamy sand, or loamy fine sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The BC horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 5. It is sand, loamy sand or loamy fine sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It is sand or fine sand in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The 2C horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 to 4. It is fine sandy loam, loam or silt loam in the fine earth fraction. Reaction ranges from moderately acid to moderately alkaline.

Flackville Series

Flackville series consists of very deep, moderately well drained soils on lake plains, and in areas between upland till ridges. These soils were formed in a sandy mantle over clayey marine or lacustrine sediments. Slopes range from 0 to 8 percent.

Flackville soils are commonly on landscapes adjacent to Bombay, Swanton, Pinconning, Muskellunge, and Sciota soils. Flackville soils were formed in sand overlying clay whereas Bombay soils are formed in loamy till deposits. Flackville soils have less redox iron depletions in the subsoil than the somewhat poorly drained Swanton soils and very poorly drained Pinconning soils. The Flackville soils differ from Muskellunge soils in having sandier textured sediments overlying clayey sediments. The Flackville soils have thinner sand deposits over silt and clay than the somewhat poorly drained Sciota soils which are very deep sand.

Typical pedon of Flackville loamy fine sand, 3 to 8 percent slopes, in the town of Chazy, Clinton County, about 330 feet west of Ashley Road and 160 feet south of Recore Road in a hayfield; USGS Beekmantown topographic quadrangle, lat. 44 degrees 50 minutes 8 seconds N., and long. 73 degrees 28 minutes 28 seconds W., NAD27:

Ap—0 to 12 inches, very dark grayish brown (10YR 3/2) loamy fine sand; weak fine subangular blocky structure parting to weak fine and very fine granular; very friable; many very fine, common fine and medium, and few coarse roots; 2 percent gravel; slightly acid (limed soil); abrupt smooth boundary.

E—12 to 14 inches, light brownish gray (10YR 6/2) fine sand; weak medium platy structure; friable; many very fine, common fine, and few medium roots; 1 percent rock fragments; neutral (limed soil); abrupt broken boundary.

Bhs—14 to 16 inches, dark brown (7.5YR 3/3) sand; very weak medium subangular blocky structure; friable (firm in place); many very fine, common fine, and few medium roots; 5 percent very fine gravel; neutral (limed soil); clear wavy boundary.

Bs—16 to 22 inches, brown (7.5YR 4/3) sand; weak medium and fine subangular blocky structure; very friable; many very fine; common fine, and few medium roots; 10 percent very fine gravel; neutral (limed soil); abrupt wavy boundary.

BC—22 to 26 inches, pale brown (10YR 6/3) loamy fine sand; weak medium platy structure; friable; common fine and very fine, and few medium roots; common fine and very fine pores; common coarse and medium dark yellowish brown (10YR 4/6) soft masses of iron oxides and common coarse faint light brownish gray (10YR 6/2) areas of iron depletion; 1 percent gravel; neutral; abrupt smooth boundary.

2BC—26 to 35 inches, dark grayish brown (2.5Y 4/2) silty clay; very weak coarse prismatic structure parting to weak medium and fine angular blocky; firm; common very fine, and few medium and fine roots; few fine and very fine pores; grayish brown (2.5Y 5/2) face of prisms; many fine and medium yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) masses of iron oxides; neutral; clear smooth boundary.

2Cg1—35 to 48 inches, dark grayish brown (2.5Y 4/2) silty clay; massive with weak medium and thick plate-like divisions, and few vertical grayish brown (2.5Y 5/2) separation cracks; firm; few very fine and fine roots; common fine and very fine, and few medium pores; many fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides and light gray (10YR 7/2) areas of iron depletion; less than 1 percent rock fragments; neutral; clear smooth boundary.

2Cg2—48 to 72 inches, grayish brown (2.5Y 5/2) silty clay; massive; very firm; common fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides and light gray (10YR 7/2) areas of iron depletion; less than 1 percent rock fragments; slightly alkaline, (slightly effervescence at 70 inches).

The thickness of the solum and depth to the underlying fine-textured material range from 20 to 40 inches. Redoximorphic features occur within 30 inches of the mineral soil surface. Rock fragments range up to 10 percent fine gravel.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is fine sandy loam, sandy loam, loamy fine sand, fine sand, or sand in the fine earth fraction. Unless limed, reaction ranges from strongly acid to slightly acid.

The Bh or Bhs is neutral or has hue of 5YR or 7.5YR, value of 1 to 3, and chroma of 0 to 2. It is loamy fine sand, fine sand, or sand in the fine earth fraction. Unless limed, reaction ranges from strongly acid to slightly acid.

The Bs horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is loamy fine sand, fine sand, or sand in the fine earth fraction. Unless limed, reaction ranges from strongly acid to neutral.

The BC horizon, if present, has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4. It is loamy fine sand, fine sand or sand in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The 2BC horizon, if present, has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4. It is silty clay loam, silty clay, or clay in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 5. It is silty clay loam, silty clay, or clay in the fine earth fraction. Free carbonates are in many pedons. Reaction ranges from neutral to moderately alkaline.

Fluvaquents

Fluvaquents consist of very deep, somewhat poorly drained to poorly drained soils formed in material deposited by rivers and streams. Fluvaquents are on the most actively flooded parts of alluvial plains. This unit is named above the series level of classification because of the variability of the soil properties and the composition of the material in which it formed. Slopes range from 0 to 3 percent.

Fluvaquents occur in a complex with well drained Udifluvents. They are commonly adjacent to Lovewell, Cornish, Medomak, Rumney, Adams, and Colton soils on the landscape. Fluvaquents have soil profiles that vary in texture, whereas Lovewell, Cornish, and Medomak soils have mainly silt loam and very fine sandy loam in the solum, and Rumney soils have mainly sandy loam or loam in the solum. Fluvaquents lack spodic development which is characteristic of Adams and Colton soils.

Fluvaquents are in that part of the floodplain where intermittent erosion and re-deposition of sediments by the stream cause the composition and properties to differ from place to place. Because of the wide range in texture and other properties, a typical pedon of Fluvaquents is not provided.

Generally, the surface layer of these soils is 2 to 12 inches thick. The depth to bedrock is more than 60 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Rock fragments including gravel, channers, and cobbles range from 0 to 50 percent by volume.

The surface layer has hue of 10YR or 2.5Y, value of 1 to 3, and chroma of 0 to 2. Textures are generally sandy loam to silt loam in the fine earth fraction with or without mucky analogues. Reaction is strongly acid to slightly alkaline.

The substratum has hue of 10YR to 5Y, value of 3 to 6, and chroma of 3 or less. Texture is generally sandy loam, silt loam, loam, or silty clay loam in the fine earth fraction. Some pedons have thin strata of sand or loamy sand. Reaction is strongly acid to slightly alkaline.

Grenville Series

The Grenville series consists of very deep, well drained soils on lowlands. These soils formed in loamy, high lime, glacial till deposits. Slopes range from 3 to 15 percent.

The Grenville soils are in a drainage sequence with moderately well drained Hogansburg soils, somewhat poorly drained Malone soils, and very poorly drained Runeberg soils. Grenville soils are also near the Neckrock and Muskellunge soils in the landscape. The Grenville soils are very deep and Neckrock soils are 20 to 40 inches deep to bedrock. Grenville soils lack redoximorphic features and have less clay than is characteristic of Muskellunge soils.

Typical pedon of Grenville loam, 3 to 8 percent slopes, in the town of Chazy, Clinton County, 700 feet north of County Route 23 (Old Route 191) and 3,080 feet west of Lakeshore Road, in a field; USGS Champlain topographic quadrangle, lat. 44 degrees 53 minutes 15 seconds N., and long. 73 degrees 23 minutes 25 seconds W., NAD27:

Ap—0 to 9 inches, dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; many fine roots; 5 percent rock fragments; slightly acid; abrupt smooth boundary.

Bw1—9 to 12 inches, brown (10YR 4/3) loam; moderate medium subangular blocky structure; very friable; common fine roots; 10 percent rock fragments; slightly acid; gradual smooth boundary.

Bw2—12 to 17 inches, dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; very friable; few fine roots; 10 percent rock fragments; neutral; gradual smooth boundary.

C—17 to 35 inches, brown (10YR 4/3) gravelly fine sandy loam; massive; friable; few fine roots; 20 percent rock fragments; moderately alkaline, strongly effervescent; clear smooth boundary.

Cd—35 to 72 inches, brown (10YR 4/3) gravelly fine sandy loam; massive; firm; common medium distinct gray (10YR 5/1) mottles; 20 percent rock fragments; moderately alkaline, strongly effervescent.

The thickness of the solum and the depth to carbonates ranges from 17 to 40 inches. Rock fragments range from 5 to 30 percent by volume in the surface, 5 to 35 percent in the subsoil, and from 15 to 40 percent in the substratum.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. It is silt loam, loam, or fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to slightly acid.

The Bw horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. It is fine sandy loam or loam in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The BC horizon, if present, has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 or 3. It is fine sandy loam or loam in the fine earth fraction. Reaction is neutral or slightly alkaline.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 3. It is fine sandy loam or loam in the fine earth fraction. Reaction is slightly alkaline or moderately alkaline and it is calcareous.

Guff Series

The Guff series consists of moderately deep, poorly drained soils on marine plains. They formed in clayey marine sediments overlying bedrock. Slopes range from 0 to 3 percent.

Guff soils are in a drainage sequence with the somewhat poorly drained Matoon soils. They are also associated with Adjidaumo, Muskellunge, Neckrock, Ogdensburg, and Runeberg soils. Adjidaumo and Muskellunge are deeper to bedrock than Guff soils. Neckrock and Ogdensburg soils have coarser material overlying the bedrock. Runeberg soils are coarser textured and deeper to bedrock than Guff soils.

Typical pedon of Guff silty clay loam, in the town of Morristown, St. Lawrence County, about 300 feet east-northeast of a point on Scotch Bush Road, that is 5,400 feet southeast of the junction of Scotch Bush Road and Center Road; USGS Edwardsville topographic quadrangle, lat. 44 degrees 35 minutes 05 seconds N., and long. 75 degrees 34 minutes 48 seconds W., NAD27:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; many very fine and fine and few medium roots; common very fine and fine tubular pores; slightly acid; abrupt wavy boundary.

Bg1—9 to 14 inches; dark gray (10YR 4/1) clay; moderate coarse prismatic structure parting to moderate fine and very fine subangular blocky; firm; sticky, plastic; common very fine and fine, and very few medium roots; common very fine and fine tubular pores; many medium distinct dark yellowish brown (10YR 4/4) soft masses of iron oxide; few medium faint very dark gray (10YR 3/1) organic stains on faces of peds; neutral; clear wavy boundary.

Bg2—14 to 20 inches; dark gray (10YR 4/1) clay; moderate coarse prismatic structure parting to moderate fine and very fine angular blocky; firm; sticky, plastic; few very fine and fine roots; common fine and very fine tubular pores; many medium and coarse distinct dark yellowish brown (10YR 4/4) soft masses of iron oxide; neutral; clear wavy boundary.

BCg—20 to 39 inches; grayish brown (10YR 5/2) silty clay; weak coarse prismatic structure parting to weak very fine angular blocky, firm; slightly sticky and slightly plastic; common very fine and fine tubular pores; common medium distinct dark gray (10YR 4/1) areas of iron depletion and dark yellowish brown (10YR 4/4) soft masses of iron oxide; few medium light gray (10YR 7/1) calcium carbonate concretions in the lower part; slightly alkaline, slightly effervescent; abrupt smooth boundary.

R—39 inches; weathered limestone bedrock. A thin discontinuous grayish brown (10YR 5/2) sandy loam layer of saprolite immediately overlies the bedrock. This layer contains about 20 percent weathered rock fragments.

The thickness of the solum ranges from 18 to 40 inches. The depth to carbonates commonly ranges from 18 to 40 inches, however; carbonates are absent in some pedons. The depth to bedrock ranges from 20 to 40 inches. Rock fragments (mainly gravel) range from 0 to 5 percent by volume in the A and B horizons, and from 0 to 20 percent in the C horizon.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Dry values are 4 or 5. Texture is silty clay loam, silty clay, silt loam, or clay in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The Bg horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. It is silty clay loam, silty clay, or clay in the fine earth fraction. Reaction is neutral or slightly alkaline.

The BCg and Cg horizons, when present, are similar in color and texture to the Bg horizon but differ in having free carbonates. Thin 2C horizons composed of glacial till or saprolite are in some pedons. Reaction in the BCg and Cg horizons are slightly or moderately alkaline.

Hailesboro Series

The Hailesboro series consists of very deep, somewhat poorly drained soils on glacial lake plains. These soils formed in silt loam and silty clay loam lacustrine or marine deposits. Slopes range from 0 to 8 percent (fig. 4).

Hailesboro soils are on landscapes near the Muskellunge, Adjidaumo, Roundabout, Flackville, Swanton, and Hogansburg soils. The Hailesboro soils do not have as much clay as the somewhat poorly drained Muskellunge soils and poorly drained Adjidaumo soils. Hailesboro soils are more clayey than the somewhat poorly drained Roundabout soils. The Hailesboro soils do not have contrasting layers as the sandy over clayey Flackville soils and the loamy over clayey Swanton soils. Hailesboro soils generally have few or no rock fragments in contrast to Hogansburg soils.

Typical pedon of Hailesboro silt loam, in the town of Champlain, Clinton County, about 400 feet north of US Route 11, at a point 400 feet east of the intersection of Route 11 and US Route 9, in a pasture; USGS Champlain topographic quadrangle, lat. 44 degrees 58 minutes 16 seconds N., and long. 73 degrees 26 minutes 43 seconds W., NAD27:

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

BE—9 to 15 inches, brown (10YR 5/3) silt loam; moderate thin and medium platy structure; friable; common fine roots; few fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides and grayish brown (10YR 5/2) areas of iron depletion; moderately acid; gradual smooth boundary.

Btg—15 to 30 inches, dark grayish brown (10YR 4/2) silty clay loam; weak thick platy structure parting to strong angular blocky; friable; few fine and medium roots; common distinct clay films on ped faces; common fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides; moderately acid; gradual smooth boundary.

Cg1—30 to 38 inches, gray (10YR 5/1) silt loam; weak medium subangular blocky structure; firm; common medium prominent yellowish brown (10YR 5/6) masses of iron oxides; slightly acid; gradual smooth boundary.

Cg2—38 to 72 inches, dark grayish brown (10YR 4/2) silty clay loam; moderate coarse angular blocky structure; firm; gray (10YR 5/1) faces of peds; neutral.

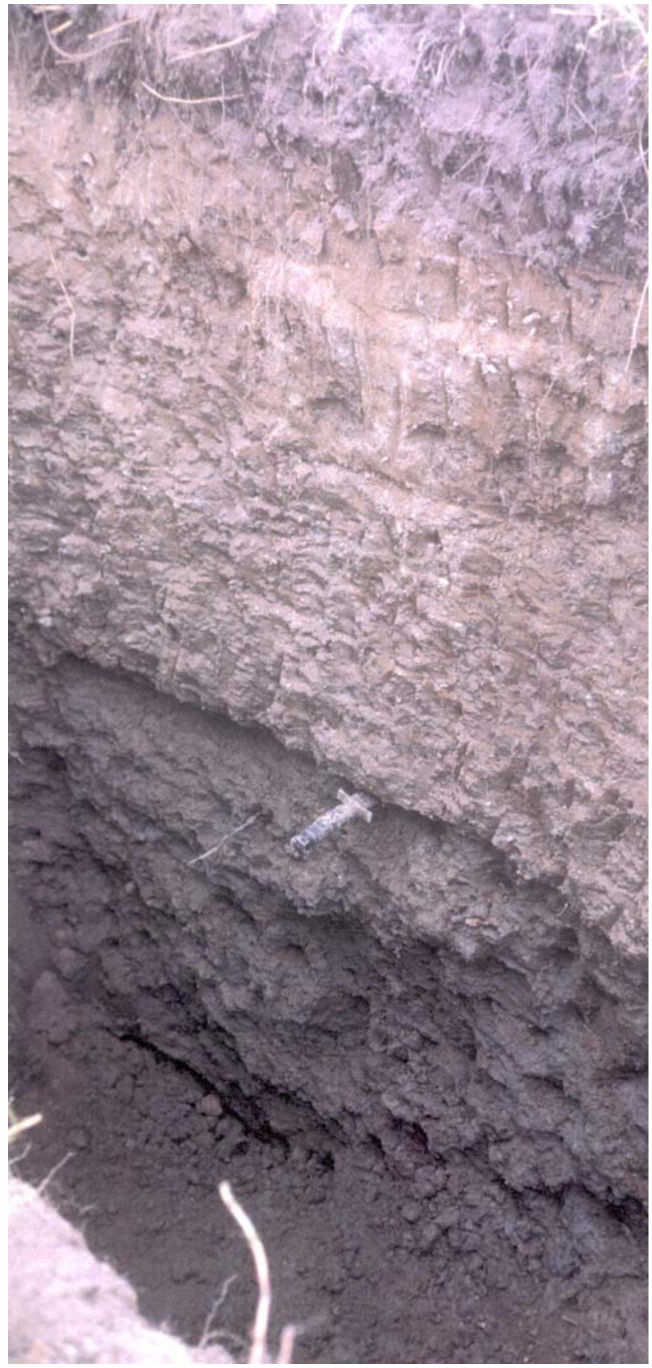

Figure 4.—A profile of Hailesboro underlain by a gray substratum (where the knife is inserted). Most of the roots are above 20 inches deep, where the soil remains mostly unsaturated or is partly saturated for short periods during the growing season.

The thickness of the solum ranges from 22 to 45 inches. Depth to carbonates ranges from 30 to 80 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 5 percent by volume throughout the soil.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 to 3. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction is moderately acid to neutral.

The BE horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 3. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction is moderately acid to slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. It is dominantly silt loam or silty clay loam in the fine earth fraction, with thin subhorizons of very fine sandy loam. Reaction ranges from moderately acid to slightly alkaline.

The BC horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. It is very fine sandy loam, silt loam or silty clay loam in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 or 3. It is very fine sandy loam, silt loam, silty clay loam, or silty clay in the fine earth fraction. Reaction is neutral to moderately alkaline.

Heuvelton Series

The Heuvelton series consists of very deep, moderately well drained soils on gently sloping and dissected glacial lake plains. These soils formed in lacustrine and marine silt and clay deposits. Slopes range from 3 to 25 percent.

The Heuvelton soils are in a drainage sequence with the somewhat poorly drained Muskellunge soils, and the poorly drained and very poorly drained Adjidaumo soils. Heuvelton soils are also near the Grenville, Hogansburg, Malone, Swanton, and Neckrock soils. Heuvelton soils have more clay in the subsoil and substratum than Grenville, Hogansburg, and Malone soils. The Heuvelton soils lack a coarse loamy subsoil as is characteristic of Swanton soils. Heuvelton soils are very deep to limestone bedrock compared to moderately deep Neckrock soils.

Typical pedon of Heuvelton silty clay loam, 3 to 8 percent slopes, in the town of Champlain, Clinton County, about 2,400 feet east of intersection of Mason Road with NY Route 9B, and about 750 feet south of NY Rt. 9B; USGS Champlain topographic quadrangle, lat. 44 degrees 56 minutes 21 seconds N., and long. 73 degrees 24 minutes 2 seconds W., NAD27:

Ap—0 to 6 inches, dark brown (10YR 3/3) silty clay loam; weak medium subangular blocky structure parting to moderate medium granular; friable; many fine and very fine roots; less than 1 percent rock fragments; neutral; abrupt smooth boundary.

BE—6 to 10 inches, brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure parting to moderate medium granular; friable; many fine and very fine roots; neutral; abrupt smooth boundary.

Bt1—10 to 18 inches, brown (10YR 5/3) silty clay; moderate fine angular blocky structure; firm; common very fine roots; common thin discontinuous clay skins on faces of peds and lining pores; moderately acid; clear smooth boundary.

Bt2—18 to 22 inches, brown (10YR 5/3) silty clay; moderate fine angular blocky structure; firm; common very fine roots; common thin discontinuous clay skins on faces of peds and lining pores; few medium distinct gray (10YR 5/1) areas of iron depletion, and common fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides; moderately acid; gradual smooth boundary.

Btg—22 to 32 inches, grayish brown (10YR 5/2) silty clay; strong fine angular blocky structure; firm; few very fine roots; common thin discontinuous clay skins on faces of peds; many fine and medium distinct dark yellowish brown (10YR 4/6) masses of iron oxides; slightly acid; clear smooth boundary.

BCg—32 to 39 inches, dark grayish brown (2.5Y 4/2) clay; strong medium and fine angular blocky structure; very firm; few very fine roots; many medium and fine distinct dark yellowish brown (10YR 4/6), and few fine distinct yellowish brown (10YR 5/6) masses of iron oxides; 1 percent rock fragments; neutral; clear smooth boundary.

Cg—39 to 72 inches, dark gray (5Y 4/1); clay; massive; very firm; few fine distinct light olive brown (2.5Y 5/4), and few medium distinct dark yellowish brown (10YR 4/6) masses of iron oxides; slightly alkaline, (strongly effervescent at 57 inches).

The thickness of the solum ranges from 20 to 40 inches. Depth of carbonates ranges from 20 to 70 inches. Redoximorphic features occur within 30 inches of the mineral soil surface. Rock fragments range from 0 to 25 percent in surface and subsurface horizons, and from 0 to 10 percent below.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is silt loam, silty clay loam or silty clay in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The BE horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It is silty clay loam, silty clay, or clay in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The E horizon, where present, has hue of 7.5YR to 5Y, value of 5 or 6, and chroma of 2 or 3. It is very fine sandy loam, silt loam or silty clay loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The B/E or E/B horizon, where present, has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It is silty clay loam, silty clay or clay in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The Bt horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 4. In pedons with matrix colors in chroma of 2, the color is lithochromic and not evidence of an aquic moisture regime. It is silty clay loam, silty clay, or clay in the fine earth fraction. Reaction ranges from moderately acid to slightly alkaline.

The BC horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 4. It is silty clay loam, silty clay, or clay in the fine earth fraction. Reaction ranges from moderately acid to slightly alkaline.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It is silty clay loam, silty clay, or clay in the fine earth fraction, or it is varved with texture ranging from clay to silt loam with fine sand and very fine sand in varves. Reaction ranges from neutral to moderately alkaline.

Hogansburg Series

The Hogansburg series consists of very deep, moderately well drained soils on upland glacial till plains. They formed in loamy, calcareous deposits derived mainly from limestone or dolomitic limestone. Slopes range from 0 to 8 percent.

The Hogansburg soils are in a drainage sequence with well drained Grenville soils, somewhat poorly drained Malone soils, and very poorly drained Runeberg soils on the landscape. The Hogansburg soils are commonly adjacent to Fahey, Coveytown, Muskellunge, and Neckrock soils on the landscape (fig. 5). Hogansburg soils have less rock fragments than the Fahey soils and less sand than in the solum of Coveytown soils. The Hogansburg soils have less clay than somewhat poorly drained Muskellunge soils. Hogansburg soils are deeper to bedrock than the moderately deep Neckrock soils.

Typical pedon of Hogansburg loam, 3 to 8 percent slopes, in the in the town of Chazy, Clinton County, about 75 feet west of the Stetson, Road at a point 2,600 feet south of the intersection of North Farm Road and the Stetson Road, in a cornfield; USGS Champlain topographic quadrangle, lat. 44 degrees 53 minutes 20 seconds N., and long. 73 degrees 24 minutes 59 seconds W., NAD27:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam; light brownish gray (10YR 6/2) dry; moderate medium and fine granular structure; very friable; common medium and fine roots; 5 percent rock fragments; neutral; abrupt smooth boundary.

Bw—10 to 15 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; very friable; common very fine and fine roots; 5 percent rock fragments; slightly alkaline; slightly effervescent; clear smooth boundary.

BC—15 to 19 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium and fine subangular blocky structure; very friable; common fine roots; few fine distinct light olive brown (2.5Y 5/6) masses of iron oxides; 10 percent rock fragments; moderately alkaline; violently effervescent; clear smooth boundary.

C—19 to 35 inches; brown (10YR 5/3) gravelly loam; moderate medium platy structure; friable; few fine roots in the upper part; many coarse prominent light gray (10YR 6/1) areas of iron depletion oriented linearly along plates, and common fine distinct light olive brown (2.5Y 5/6) masses of iron oxides; 15 percent rock fragments; moderately alkaline; violently effervescent; clear wavy boundary.

Cd—35 to 72 inches; brown (10YR 5/3) gravelly loam; moderate medium platy structure; firm; few fine faint dark yellowish brown (10YR 4/6) masses of iron oxides and few coarse faint grayish brown (10YR 5/2) areas of iron depletion; 20 percent rock fragments (including 5 percent cobbles); moderately alkaline; violently effervescent.

Thickness of the solum ranges from 18 to 34 inches. Depth to carbonates ranges from 10 to 33 inches. Redoximorphic features occur within 30 inches of the mineral soil surface. Rock fragments range from 3 to 35 percent by volume in the surface, 5 to 35 percent in the subsoil, and 15 to 40 percent in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is silt loam, loam, or fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The Bw horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam, loam or fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to slightly alkaline.

The BC horizon has hue of 10YR or 2.5Y, value of 4

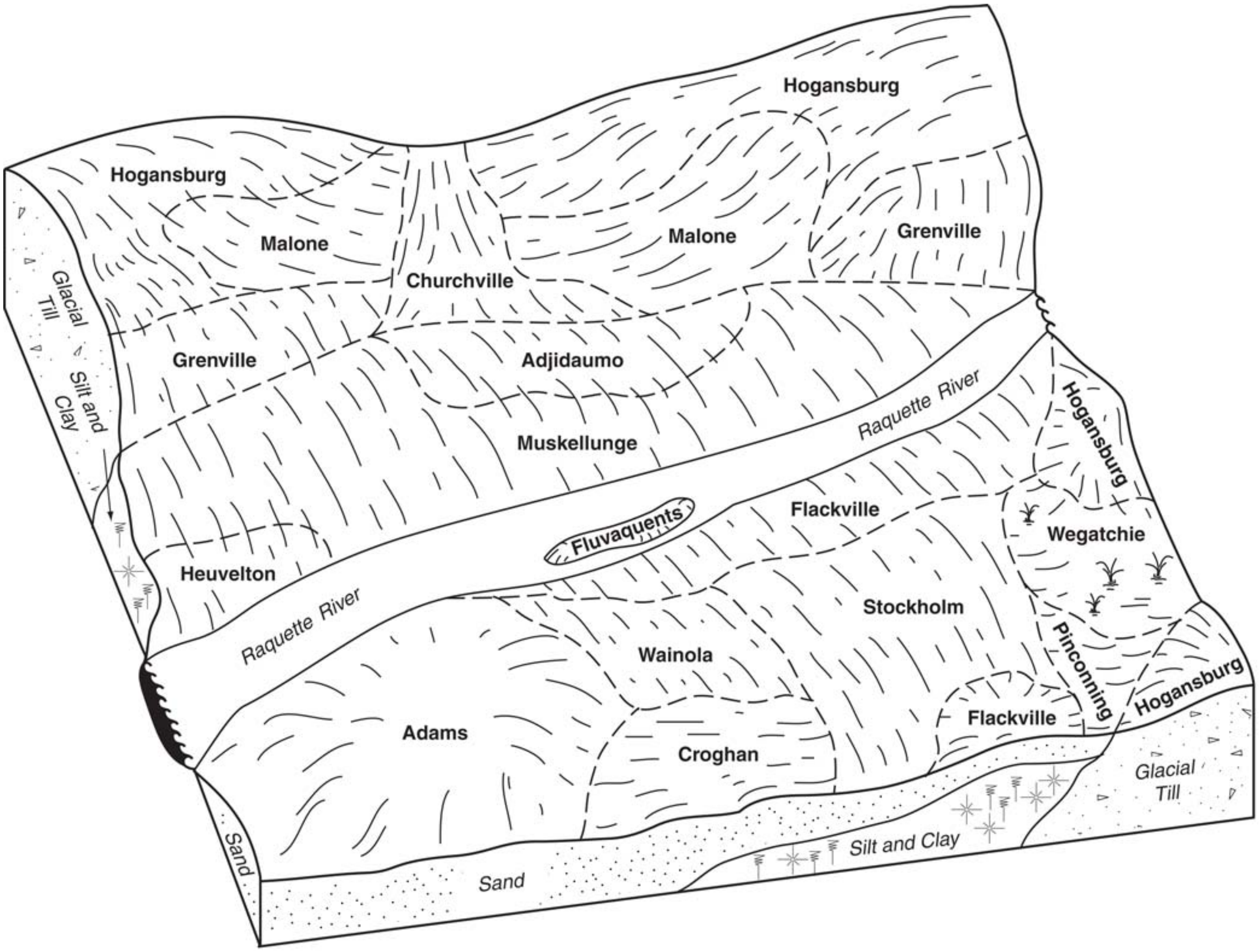

Figure 5.—One of three major rivers flow through Akwesasne. The Raquetter River sliced through glacial till ridges (consisting of Grenville, Hogansburg, and Malone soils) and deposited fine-grained sands at varying depths over silt, clay or loamy till. The silt and clay sediments of Adjidaumo and Muskellunge soils are remnants of proglacial lake and marine environments.

or 5, and chroma of 2 to 4. Texture is silt loam, loam or fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to moderately alkaline.

The C or Cd horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 or 3. Texture is loam or fine sandy loam in the fine earth fraction. Reaction is slightly alkaline or moderately alkaline.

Lovewell Series

The Lovewell series consists of very deep, moderately well drained soils on flood plains. These soils formed in alluvial sediments dominated by very fine sand and silt. Slopes range from 0 to 3 percent.

The Lovewell soils are in a drainage sequence with the somewhat poorly drained Cornish soils and the very poorly drained Medomak soils. Lovewell soils are also in the landscape near the Monadnock, Hogansburg, Adams, Colton, and Wonsqueak soils. Lovewell soils have fewer rock fragments than Monadnock and Hogansburg soils. The Lovewell soils have an irregular decrease in organic carbon content relative to depth whereas Adams and Colton soils decrease in organic carbon with depth. Lovewell soils do not have a thick organic accumulation as is characteristic of Wonsqueak soils.

Typical pedon of Lovewell very fine sandy loam, stratified substratum, in the town of Champlain, Clinton County, about 250 feet north of intersection of Simmons Road with St. John's Road, and 2,600 feet east of St. John's Road, in a cornfield; USGS Mooers topographic quadrangle, lat. 44 degrees 57 minutes 14 seconds N., and long. 73 degrees 30 minutes 31 seconds W., NAD27:

Ap—0 to 11 inches, dark brown (10YR 3/3) very fine sandy loam; weak coarse subangular blocky structure parting to weak medium granular; friable; common very fine roots; moderately acid; abrupt smooth boundary.

Bw1—11 to 20 inches, yellowish brown (10YR 5/4) very fine sandy loam; weak coarse and medium subangular blocky structure; friable; few very fine roots; moderately acid; clear wavy boundary.

Bw2—20 to 30 inches, yellowish brown (10YR 5/4) very fine sandy loam, grayish brown (10YR 5/2) face of prisms; weak very coarse prismatic structure parting to weak coarse subangular blocky; few very fine roots; common medium distinct grayish brown (10YR 5/2) areas of iron depletion, and common medium faint dark yellowish brown (10YR 4/4) masses of iron oxides; strongly acid; clear smooth boundary.

Cg1—30 to 50 inches, light brownish gray (10YR 6/2) very fine sandy loam; massive; friable; many medium distinct dark yellowish brown (10YR 4/4) and dark yellowish brown (10YR 4/6), and common fine distinct yellowish brown (10YR 5/6) masses of iron oxides; very strongly acid; abrupt smooth boundary.

Cg2—50 to 56 inches, grayish brown (10YR 5/2) fine sand; massive with weak thick plate-like divisions; very friable; many medium and coarse yellowish brown (10YR 5/6 and 5/4) masses of iron oxides; strongly acid; clear smooth boundary.

Cg3—56 to 75 inches, gray (10YR 5/1) fine sand; massive; very friable; many coarse distinct dark yellowish brown (10YR 3/4) masses of iron oxides; strongly acid.

Thickness of the solum ranges from 20 to 30 inches. Redoximorphic features occur within 30 inches of the mineral soil surface. Rock fragments range from 0 to 5 percent by volume to a depth of 40 inches and from 0 to 20 percent below 40 inches. Some pedons have buried horizons.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 4. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid unless limed.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silt loam, very fine sandy loam, or loamy very fine sand in the fine earth fraction. Below 40 inches texture ranges from silt loam to fine gravel. Reaction ranges from very strongly acid to slightly acid.

Malone Series

The Malone series consists of very deep, somewhat poorly drained soils on lowlands. They formed in loamy calcareous glacial till derived mainly from dolostone or limestone. Slopes range from 0 to 8 percent.

The Malone soils are in a drainage sequence with well drained Grenville soils, moderately well drained Hogansburg soils, and very poorly drained Runeberg soils. Malone soils are adjacent to Kalurah, Coveytown, Muskellunge, Hailesboro, and Swanton soils. The Malone soils have redoximorphic features higher in the subsoil than Grenville and Hogansburg soils. Malone soils lack the sandy subsoil that is part of Coveytown soils. Muskellunge and Hailesboro soils are dominated by lacustrine clay and silt sediments. Malone soils lack a clayey substratum characteristic of Swanton soils.

Typical pedon of Malone gravelly loam, 0 to 3 percent slopes, in the town of Plattsburgh, Clinton County, 0.7 mile south of Beekmantown townline, about 1.6 miles northeast of West Plattsburgh and 25 feet east of State Route 190, in a pasture; USGS Morrisonville topographic quadrangle, lat. 44 degrees 43 minutes 32 seconds N., and long. 73 degrees 32 minutes 28 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) gravelly loam; light brownish gray (10YR 6/2); moderate fine granular structure; very friable; many fine roots; 20 percent rock fragments; slightly acid; clear smooth boundary.

Bw1—9 to 20 inches, brown (10YR 5/3) gravelly fine sandy loam, grayish brown (10YR 5/2) to gray (10YR 5/1) on faces of peds; weak medium and fine blocky structure; ; friable; common fine roots; few fine pores; many (30 percent) medium faint grayish brown (10YR 5/2) areas of iron depletion and common (20 percent) medium faint yellowish brown (10YR 5/6) masses of iron oxides; 25 percent rock fragments; slightly acid; gradual wavy boundary.

Bw2—20 to 30 inches, brown (10YR 5/3) gravelly fine sandy loam; massive; friable; few fine roots; few fine pores; many (40 percent) medium faint yellowish brown (10YR 5/6) masses of iron oxides; 30 percent rock fragments; neutral; clear wavy boundary.

Cdg—30 to 72 inches, grayish brown (10YR 5/2) very gravelly sandy loam; weak thick platy structure; very firm; few medium and fine faint brown (10YR 5/3) and distinct yellowish brown (10YR 5/6) masses of iron oxides; 35 percent rock fragments; strongly effervescent; moderately alkaline.

Thickness of the solum ranges from 18 to 36 inches. Depth of carbonates ranges from 20 to 50 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments range from 5 to 35 percent by volume in the surface and subsoil, and from 5 to 50 percent in the substratum.

The Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. Texture ranges from silt loam, loam, fine sandy loam, or sandy loam in the fine earth fraction. Reaction is moderately acid or slightly acid.

The Bw horizon has hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 6. Texture is loam, fine sandy loam or sandy loam in the fine earth fraction. Reaction is slightly acid or neutral.

The Bg horizon, if present, has hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 1 or 2. Texture is loam, fine sandy loam, or sandy loam in the fine earth fraction. Reaction is slightly acid or neutral.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6 and chroma of 2 to 4. Texture is fine sandy loam or sandy loam in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

Matoon Series

The Matoon series consists of moderately deep, somewhat poorly drained soils formed in silt and clay sediments deposited in marine environments. They are nearly level or gently sloping soils where the underlying bedrock is 20 to 40 inches deep. Slope generally ranges from 0 to 6 percent.

Matoon soils are in a drainage sequence with the poorly drained Guff soils. They are also associated with Heuvelton, Muskellunge, Adjidaumo, Summerville, Neckrock, and Ogdensburg soils. Heuvelton, Muskellunge, and Adjidaumo soils formed in materials similar to Matoon soils but are all very deep. Summerville are loamy soils shallow to bedrock. Neckrock soils are on higher landscape positions and have less clay. Ogdensburg soils are on similar landscape positions but have less clay.

Typical pedon of Matoon silty clay loam, 0 to 2 percent slopes, in the town of Morristown, St. Lawrence County, about 200 feet northeast of a point on Old Mills Road that is 200 feet from the junction with NY Route 37; USGS Morristown topographic quadrangle, lat. 44 degrees 32 minutes 50 seconds N., and long. 75 degrees 39 minutes 43 seconds W., NAD27:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 6/1) dry; moderate very fine, fine and medium granular structure; very friable; many fine and few medium roots; slightly acid, abrupt smooth boundary.

BAg—8 to 12 inches; dark gray (10YR 4/1) and gray (10YR 5/1) silty clay loam; grayish brown (10YR 5/2) on faces of peds; moderate fine and medium subangular blocky structure; friable; common fine and few medium roots; many fine vesicular, few fine and medium tubular pores; few faint silt linings in tubular pores; many fine and medium distinct strong brown (7.5YR 4/6 and 5/6) and common fine faint yellowish brown (10YR 5/4) soft masses of iron oxide, total 40 percent; neutral; abrupt smooth boundary.

Btg1—12 to 16 inches; gray (5Y 5/1) silty clay; dark gray (10YR 4/1) to gray (10YR 5/1) on faces of peds; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and few medium roots; few very fine, fine and medium vesicular pores; common distinct dark gray (10YR 4/1) clay films on ped faces and in pores; many fine and medium distinct dark yellowsih brown (10YR 4/4), strong brown (7.5YR 4/6) and brown ((7.5YR 5/4) soft masses of iron oxide; neutral; clear wavy boundary.

Btg2—16 to 27 inches; dark grayish brown (10YR 4/2) clay; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few fine and medium roots; few fine and medium vesicular pores; few faint clay films on ped faces and in pores; few fine and medium faint yellowish brown (10YR 5/4) soft masses of iron oxide; less than 1% rock fragments; slightly alkaline; slightly effervescent; abrupt smooth boundary.

R—27 inches, sandstone bedrock.

The thickness of the solum ranges from 16 to 40 inches. Depth to bedrock ranges from 20 to 40 inches. Carbonates are commonly found in the horizon above the bedrock. Rock fragments, mostly gravel or cobbles, range from 0 to 2 percent by volume in the A and upper B horizons, and from 0 to 20 percent in the lower part of the B horizon and in the C horizon.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. Texture is silt loam or silty clay loam in the fine earth fraction. Reaction is slightly acid or neutral.

The BA horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 or 2. Texture is silt loam, silty clay loam or silty clay in the fine earth fraction. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2 in some subhorizons. It has redoximorphic features in the form of soft masses of iron oxides. Texture is silty clay loam, silty clay or clay in the fine earth fraction. Reaction is neutral or slightly alkaline.

Some pedons have a C horizon that has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 or 2. This horizon commonly is silt loam, silty clay loam or silty clay in the fine-earth fraction. It is less commonly varved silt and very fine sand. Some pedons have a thin layer of saprolite above the rock. Reaction ranges from neutral to moderately alkaline.

The R horizon is sandstone, dolomitic sandstone, or limestone bedrock.

Mino Series

The Mino series consists of very deep, somewhat poorly drained soils on lowland plains. These soils were formed in loamy glacial lacustrine deposits. Slopes range from 0 to 3 percent.

The Mino soils occur on landscapes near the Hailesboro, Muskellunge, Swanton, and Hogansburg soils. Mino soils have less clay throughout the profile than both Hailesboro and Muskellunge soils. The Mino soils lack clayey substrata as is characteristic of Swanton soils. Mino soils typically lack or have only trace amounts of rock fragments which are more common in Hogansburg soil profiles.

Typical pedon of Mino loam, in the town of Beekmantown, Clinton County, about 0.3 mile west of U.S. Route 9 and about 100 feet south of Conroy Road, in a cornfield; USGS Beekmantown topographic quadrangle, lat. 44 degrees 47 minutes 22 seconds N., and long. 73 degrees 26 minutes 6 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) loam; light brownish gray (10YR 6/2) dry; moderage fine granular structure; very friable; many fine roots; 1 percent rock fragments; moderately acid; gradual smooth boundary.

Bw1—9 to 12 inches, brown (10YR 5/3) very fine sandy loam; weak fine granular structure; friable; few medium and fine roots; common medium distinct light yellowish brown (10YR 6/4) and common medium distinct yellowish brown (10YR 5/8) masses of iron oxides, and few medium faint grayish brown (10YR 5/2) areas of iron depletion; 1 percent rock fragments; neutral; gradual smooth boundary.

Bw2—12 to 16 inches, pale brown (10YR 6/3) loamy very fine sand; weak fine angular blocky structure; friable; few medium and fine roots; many medium distinct yellowish brown (10YR 5/6 and yellowish brown (10YR 5/8) masses of iron oxides; neutral; gradual smooth boundary.

Bw3—16 to 24 inches, brown (10YR 5/3) very fine sandy loam; weak fine angular blocky structure; friable; few medium and fine roots; grayish brown (10YR 5/2) on faces of peds; many medium distinct strong brown (7.5YR 5/8) masses of iron oxides, and many medium distinct brown (7.5YR 5/2) areas of iron depletion; 1 percent rock fragments; neutral; gradual smooth boundary.

Cg1—24 to 37 inches, light gray (10YR 7/2) very fine sandy loam; massive with weak medium plate-like divisions; friable; many medium distinct brownish yellow (10YR 6/6) masses of iron oxides; 1 percent rock fragments; neutral; gradual smooth boundary.

Cg2—37 to 78 inches, gray (10YR 5/1) very fine sandy loam; massive; friable; common medium distinct yellowish brown (10YR 5/6) masses of iron oxides; neutral.

The thickness of the solum ranges from 20 to 40 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 5 percent by volume in the solum and substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. Texture is fine sandy loam, very fine sandy loam, loam or silt loam in the fine earth fraction. Reaction ranges from strongly acid to slightly acid.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is fine sandy loam, very fine sandy loam, and loam in the fine earth fraction, with thin subhorizons of silt loam and loamy very fine sand. Reaction ranges from moderately acid to neutral.

The BC horizon, if present, has hue of 7.5YR to 2.5Y, value of 4 to 7 and chroma of 2 to 4. Texture is fine sandy loam, very fine sandy loam and loam in the fine earth fraction. Reaction ranges from moderately acid to neutral.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4. Texture is fine sandy loam, very fine sandy loam, and loam in the fine earth fraction. Reaction ranges from slightly acid to moderately alkaline.

Munuscong Series

The Munuscong series consists of very deep, very poorly drained soils formed in loamy materials deposited over fine marine sediments. They are nearly level soils in low-lying areas on marine plains and in basins in the uplands. Slopes range from 0 to 2 percent.

Munuscong soils are in a drainage sequence with the moderately well drained Elmwood soils and the somewhat poorly drained Swanton soils. Other associated soils include the Adjidaumo, Dorval, Guff, Ogdensburg, Runeberg, Stockholm and Wegatchie soils. Munuscong soils have coarser textures in the subsoil than the Adjidaumo, Wegatchie, and Guff soils. Munuscong soils are deeper to bedrock than the Guff and Ogdensburg soils. Munuscong soils do not have organic subsoil horizons like Dorval soils. Munuscong soils have finer textured substratums than Runeberg soils and finer textured subsoils than Stockholm soils.

Typical pedon of Munuscong mucky fine sandy loam, in the town of Lisbon, St. Lawrence County, about 400 feet west-southwest of a point on County Road 53 that is 100 feet east-southeast of the intersection of Fisher Rd; USGS Morley topographic quadrangle, lat. 44 degrees 41 minutes 07 seconds N., and long. 75 degrees 13 minutes 47 seconds W., NAD27:

Ap—0 to 8 inches; black (10YR 2/1) mucky fine sandy loam, grayish brown (10YR 5/2) dry; strong medium granular structure; friable; many fine roots; neutral; abrupt wavy boundary.

Bg—8 to 22 inches; light gray (10YR 6/1) fine sandy loam; many white (10YR 8/1) washed fine sand grains; weak fine subangular blocky structure; very friable; few fine and medium tubular and vesicular pores, few coarse tubular pores; thin grayish brown firm lens at the bottom of the horizon have few coarse pores with thin continuous clay linings; common fine roots; common medium prominent yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) soft masses of iron oxide; slightly alkaline; clear wavy boundary.

BCg—22 to 26 inches; grayish brown (10YR 5/2) fine sandy loam; weak thin platy structure; friable; few fine and medium vesicular pores; few fine roots; common medium prominent yellowish red (5YR 5/6) soft masses of iron oxide and common medium distinct light gray (10YR 7/2) areas of iron depletion; slightly alkaline, slightly effervescent; abrupt smooth boundary.

2Cg1—26 to 38 inches; grayish brown (10YR 5/2) silty clay; few thin lenses of gray (10YR 5/1) fine sandy loam which total 1.5 inches; weak thick platy divisions (varved); firm, slightly sticky; very fine, medium and coarse pores, thin discontinuous clay films in larger pores; few fine roots; many medium and coarse distinct yellowish brown (10YR 5/6) soft masses of iron oxide and few medium faint light gray (10YR 6/1) areas of iron depletion; moderately alkaline, slightly effervescent; gradual wavy boundary.

2Cg2—38 to 48 inches; gray (10 YR 5/1) silty clay loam; weak thick plate-like divisions; firm, sticky; few fine, medium and coarse pores; few fine roots; many coarse prominent reddish brown (2.5YR 4/4), 5YR 4/4) soft masses of iron oxide and common medium distinct brown (7.5YR 4/4) root stains in old root channels; moderately alkaline, slightly effervescent; gradual wavy boundary.

2Cg3—48 to 98 inches; gray (10YR 5/1) silty clay; few white (N 8/ , 10YR 8/2) shell fragments; weak fine and medium plate-like divisions; firm, sticky; few fine, medium and coarse pores; few fine roots in top 6 inches; few coarse prominent olive brown (2.5Y 4/4) soft masses of iron oxide; moderately alkaline, strongly effervescent.

The thickness of the solum ranges from 20 to 40 inches. Depth to carbonates ranges from 20 to 40 inches. Rock fragment content throughout the soil ranges from 0 to 5 percent by volume.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam. Reaction ranges from slightly acid to slightly alkaline.

The Bg horizon has hue of 10YR to 5Y, chroma of 1 or 2, and value of 4 to 6. It is fine sandy loam or sandy loam. Thin strata of loam or sandy clay loam are in some pedons. Reaction ranges from slightly acid to slightly alkaline.

The BCg horizon, present in some pedons, is similar in characteristics to the Bg horizon.

The 2C horizon has hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 4. It is silty clay, silty clay loam, or clay. Reaction is slightly alkaline or moderately alkaline.

Muskellunge Series

The Muskellunge series consists of very deep, somewhat poorly drained soils on glacial lake plains. These soils formed in lacustrine and marine sediments having a high content of clay and silt. Slopes range from 0 to 8 percent.

The Muskellunge soils are in a drainage sequence with the moderately well drained Heuvelton soils, and the poorly drained and very poorly drained Adjidaumo soils. Muskellunge soils are also near the Hogansburg, Malone, Hailesboro, Swanton, and Pinconning soils on the landscape. The Muskellunge soils generally lack rock fragments which are common in the Hogansburg and Malone soils. Muskellunge soils have more clay throughout the subsoil and substratum than the Hailesboro soils. Muskellunge soils have more clay in the surface and subsoil than Swanton and Pinconning soils.

Typical pedon of Muskellunge silty clay loam, 0 to 3 percent slopes, in the town of Beekmantown, Clinton County, about 2,200 feet east of Moffitt Road and

1,100 feet south of Pardy Road (at the dead end portion), in a cornfield; USGS Beekmantown topographic quadrangle, lat. 44 degrees 45 minutes 30 seconds N., and long. 73 degrees 26 minutes 7 seconds W., NAD27:

Ap—0 to 9 inches, dark brown (10YR 3/3) silty clay loam; light brownish gray (10YR 6/2) dry; weak course and medium blocky structure parting to weak very fine subangular blocky; firm; common very fine roots; slightly alkaline (limed); abrupt smooth boundary.

BE—9 to 16 inches, dark grayish brown (10YR 4/2) silty clay; moderate very fine angular blocky structure; firm; common very fine roots; many fine faint dark yellowish brown (10YR 4/4) masses of iron oxides; neutral; clear smooth boundary.

Bt1—16 to 23 inches, brown (10YR 5/3) silty clay; strong fine angular blocky structure; firm; common very fine roots; grayish brown (10YR 5/2) on faces of peds; common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron oxides; neutral; clear wavy boundary.

Bt2—23 to 38 inches, brown (10YR 5/3) silty clay; strong medium and fine angular blocky structure; firm; few very fine roots; gray (10YR 5/1) on faces of peds; few fine distinct yellowish brown (10YR 5/6) and many fine distinct dark yellowish brown (10YR 4/4) masses of iron oxides; slightly alkaline; abrupt smooth boundary.

Cg1—38 to 45 inches, brown (7.5YR 4/2) silty clay; weak thick platy structure; firm; gray (10YR 5/1) on faces of platy aggregates; few fine distinct grayish brown (10YR 5/2) areas of iron depletion and many medium distinct yellowish brown (10YR 5/6) masses of iron oxides; slightly alkaline; abrupt smooth boundary.

Cg2—45 to 72 inches, dark yellowish brown (10YR 4/4) clay; massive; very firm; gray (5Y 5/1) on faces of common vertical desiccation cracks; common medium and course distinct yellowish brown (10YR 5/6) masses of iron oxides; slightly alkaline, slightly effervescent.

The thickness of the solum ranges from 20 to 40 inches. Depth to carbonates ranges from 20 to 70 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Gravel ranges from 0 to 5 percent by volume in the solum and 0 to 10 percent in the substratum.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. It is silt loam or silty clay loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The E or BE horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. Texture is silt loam or silty clay loam in the fine earth fraction, and also, includes silty clay in BE horizons. Reaction ranges from strongly acid to slightly alkaline.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is silty clay loam, silty clay or clay within the range of 35 to 60 percent clay. Reaction ranges from strongly acid to slightly alkaline.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 3. Texture is silty clay or clay in the fine earth fraction. Varves may occur in the lower part with silt and very fine sand textures included. Reaction ranges from neutral to moderately alkaline.

Neckrock Series

The Neckrock series consists of moderately deep, well drained soils on limestone (or dolomitic limestone) bedrock controlled lowlands. They formed in loamy glacial till deposits. Slopes range from 0 to 15 percent.

The Neckrock soils are in a drainage sequence with the somewhat poorly drained Ogdensburg soils. Neckrock soils are also near the Summerville, Hogansburg, Grenville, Coveytown, and Muskellunge soils on the landscape. Moderately deep Neckrock soils are on similar landforms as the shallow Summerville soils. The Neckrock soils have bedrock within 40 inches deep whereas Hogansburg, Grenville, Coveytown, and Muskellunge soils are very deep to bedrock.

Typical pedon of Neckrock loam, in a Neckrock-Summerville complex, strongly sloping, very rocky, in the town of Chazy, Clinton County, about 1.2 miles northeast of intersection of Old Route 348 and Ashley Road, and about 50 feet northwest of Route 348, in a wooded area; USGS Beekmantown topographic quadrangle, lat. 44 degrees 52 minutes 4 seconds N., and long. 73 degrees 27 minutes 21 seconds W., NAD27:

A—0 to 9 inches, very dark grayish brown (10YR 3/2) loam; light brownish gray (10YR 6/2) dry; moderate fine and very fine subangular blocky structure parting to weak fine and very fine granular; very friable; many fine, very fine and medium, and few coarse roots; 10 percent rock fragments (including 5 percent cobbles); moderately acid; clear smooth boundary.

EB—9 to 17 inches, brown (10YR 5/3) and yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure parting to moderate fine subangular blocky; friable; many very fine, and common medium and fine roots; 10 percent rock fragments; slightly acid; clear smooth boundary.

Bt—17 to 27 inches, yellowish brown and dark yellowish brown (10YR 5/4 and 4/4) cobbly loam; weak medium subangular blocky structure parting to moderate fine subangular blocky; common clay films on faces of peds and in pores; friable; many fine, and common medium and very fine roots; common fine and very fine, and few medium pores; 15 percent rock fragments (including 5 percent cobbles); neutral; clear smooth boundary.

C—27 to 32 inches, brown (10YR 4/3) very gravelly loam; massive; firm; few fine roots; few fine and medium pores; 40 percent rock fragments (including 5 percent cobbles); strongly effervescent, moderately alkaline; abrupt irregular boundary.

2R—32 inches, dark gray (10YR 4/1) fractured limestone bedrock.

Thickness of the solum and depth to bedrock is 20 to 40 inches. Carbonates occur within 6 inches of bedrock contact in most pedons. Clay content in the argillic horizon ranges from 18 to 22 percent. Rock fragments range from 5 to 25 percent by volume in the solum, and from 10 to 45 percent in the substratum. The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. Texture is silt loam, loam or fine sandy loam in the fine earth fraction. Unless limed, reaction ranges from moderately acid to slightly alkaline.

The EB or BE horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3 in the E part, and chroma of 4 to 6 in the B part. Texture is loam or fine sandy loam in the fine earth fraction. Reaction ranges from moderately acid to slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6 (with chroma of 2 being inherent parent material color). Texture is silty clay loam, silt loam or loam in the fine earth fraction. Reaction ranges from moderately acid to slightly alkaline.

The BC horizon, if present, has hue of 10YR or 2.5Y, value of 4 or 5 and chroma of 2 to 4 (with chroma of 2 being inherent parent material color). Few faint redox concentrations may be present. Texture is silty clay loam, silt loam or loam in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

The C horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. Few faint or distinct redox concentrations may be present. Texture is fine sandy loam, loam or silt loam in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

Nicholville Series

The Nicholville series consists of very deep, moderately well drained soils on glacial lake plains and low benches in the uplands. These soils formed in wind or water deposited material having a high content of silt and very fine sand. Slopes range from 0 to 8 percent.

The Nicholville soils are in a drainage sequence with the somewhat poorly drained Roundabout soils. The Nicholville soils are on landscapes near the Adams, Muskellunge, Hailesboro, Monadnock, and Schroon soils. Nicholville soils are finer textured than the sandy Adams soils, and they are coarser textured than the clayey Muskellunge and Hailesboro soils. Nicholville soils typically have more silt and very fine sand and less rock fragments than the loamy Monadnock and Schroon soils.

Typical pedon of Nicholville very fine sandy loam, 3 to 8 percent slopes, in the town of Beekmantown, Clinton County, about 5/8 mile south of the junction of NY Route 22 and West Hill Road, then 0.25 mile east of Route 22, in a field along a drainage ditch; USGS Plattsburgh topographic quadrangle, lat. 44 degrees 44 minutes 41 seconds N., and long. 73 degrees 27 minutes 52 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine granular structure; very friable; common medium, fine, and very fine roots; few medium, and common fine and very fine pores; moderately acid; abrupt smooth boundary.

Bs1—9 to 12 inches, dark brown (7.5YR 3/4) very fine sandy loam; weak medium subangular blocky structure; very friable; common fine and very fine roots; common fine and very fine pores; moderately acid; abrupt smooth boundary.

Bs2—12 to 20 inches, brown (7.5YR 4/4) very fine sandy loam; weak medium and fine subangular blocky structure; very friable; common fine and very fine roots; common fine and very fine pores; few fine faint strong brown (7.5YR 4/6) masses of iron oxides; moderately acid; clear wavy boundary.

C1—20 to 30 inches, brown (10YR 5/3) loamy very fine sand; single grain; very friable; few fine and very fine roots; common fine and very fine pores; common medium distinct strong brown (7.5YR 4/6) and few fine distinct dark brown (7.5YR 3/4) soft masses of iron oxides; moderately acid; clear wavy boundary.

C2—30 to 34 inches, dark brown (10YR 4/3) loamy fine sand; single grain; very friable; few fine and very fine pores; few fine distinct brown (7.5YR 4/4) masses of iron oxides and few fine distinct dark brown (7.5YR 3/2) areas of iron depletion; moderately acid; clear smooth boundary.

2C—34 to 72 inches, grayish brown (10YR 5/2) loamy very fine sand; massive; friable; few fine and very fine pores; many coarse distinct brown (7.5YR 4/4) and common fine distinct strong brown (7.5YR 4/6) masses of iron oxides; moderately acid.

The thickness of the solum ranges from 12 to 38 inches. Redoximorphic features occur between 20 to 30 inches below the mineral soil surface. Depth to bedrock is more than 60 inches. Rock fragments range from 0 to 10 percent by volume throughout the soil.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction ranges from extremely acid to moderately acid, unless limed.

In some undisturbed areas, the soil typically has an O horizon, an E horizon, and a Bh or Bhs horizon. These are usually destroyed by plowing.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. It ranges from loamy very fine sand to silt loam in the fine earth fraction. Reaction ranges from very strongly acid to moderately acid.

The 2C or C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. The fine earth fraction ranges from silt loam to loamy fine sand in the fine earth fraction above a depth of 38 inches, and sandy loam or silt loam to very fine sand below. Reaction ranges from very strongly acid to slightly acid.

Pinconning Series

The Pinconning series consists of very deep, very poorly drained soils on glacial lake plains, upland depressions and swales between glacial lake beach deposits. These soils formed in loamy sands over lacustrine silt and clay. Slopes range from 0 to 2 percent.

The Pinconning soils are in a drainage sequence with moderately well drained Flackville soils and in close association with somewhat poorly drained Swanton soils. Pinconning soils have more sand in the surface and subsoil than the Swanton soils. The Pinconning soils are also adjacent in the landscape to the Sciota, Wainola, Deinache, Adjidaumo, Wonsqueak, and Hogansburg soils. Pinconning soils have 20 to 40 inches of sandy material over clay whereas Sciota, Wainola, and Deinache have deeper sand deposits. Pinconning soils differ from Adjidaumo soils in having a sandy mantle whereas Adjidaumo soils generally lack sandy material. The Pinconning soils do not have a thick organic surface and subsurface that is characteristic of Wonsqueak soils. Finally, Pinconning soils generally lack rock fragments which are characteristic of loamy Hogansburg soils formed in glacial till.

Typical pedon of Pinconning mucky loamy fine sand, in the town of Champlain, Clinton County, about 1,600 feet east of Angelville Road and McBride Road intersection, and 500 feet north of McBride Road, in a hayfield; USGS Mooers topographic quadrangle, lat. 44 degrees 55 minutes 4 seconds N., and long. 73 degrees 31 minutes 5 seconds W., NAD27:

Ap—0 to 9 inches, very dark brown (10YR 2/2) mucky loamy fine sand, dark grayish brown (10YR 4/2) dry; moderate fine and very fine granular structure; very friable; many very fine, and common fine roots; neutral; abrupt smooth boundary.

Cg1—9 to 11 inches, gray (10YR 6/1) fine sand; weak medium and thick platy structure; very friable; common very fine roots; few fine and medium distinct brownish yellow (10YR 6/6) soft masses of iron oxides; slightly alkaline; clear smooth boundary.

Cg2—11 to 22 inches, 60 percent light gray (10YR 7/1) and grayish brown (10YR 5/2) fine sand; moderate thick and medium platy structure; very friable; few very fine roots; few fine and medium distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) soft masses of iron oxides; slightly alkaline; clear smooth boundary.

Cg3—22 to 27 inches, gray (10YR 5/1) loamy fine sand; massive; very friable; common fine and very fine, and few medium tubular pores; common medium distinct yellowish brown (10YR 5/6) and common medium and coarse distinct yellowish brown (10YR 5/4) soft masses of iron oxides; 1 percent cobbles; slightly alkaline; clear smooth boundary.

Cg4—27 to 36 inches, gray (10YR 5/1) loamy fine sand; massive; very friable; common fine and medium tubular pores; few medium distinct yellowish brown (10YR 5/4) soft masses of iron oxides; 1 percent cobbles; slightly alkaline; abrupt smooth boundary.

2Cg5—36 to 60 inches, dark gray (10YR 4/1) varved silt loam and silty clay; weak thick and very thick varves; firm; many medium and common fine tubular pores; common medium distinct dark yellowish brown (10YR 4/4 and 4/6) soft masses of iron oxides; slightly effervescent, slightly alkaline; clear smooth boundary.

2Cg6—60 to 72 inches, dark gray (N 4/0) silty clay; massive; firm; few very fine pores; common coarse distinct dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) soft masses of iron oxides; slightly effervescent, slightly alkaline.

The depth to contrasting material ranges from 20 to 40 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments are one percent or less by volume.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Texture is sand, fine sand, loamy sand, loamy fine sand, sandy loam or fine sandy loam with or without mucky analogue. Reaction is moderately acid to slightly alkaline.

The Cg horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. Texture is sand, fine sand, loamy sand, loamy fine sand in the fine earth fraction. Reaction is slightly acid to slightly alkaline.

The 2C horizon has hue of 10YR to 5Y (or it is neutral), value of 4 to 7, and chroma of 0 to 4. Texture is silty clay loam, silty clay or clay in the fine earth fraction. Reaction is slightly alkaline or moderately alkaline.

Redwater Series

The Redwater series consists of deep, somewhat poorly drained soils. They formed in recent alluvium where the stream gradient is controlled by bedrock. Slopes range from 0 to 3 percent.

Redwater soils are associated with the Adams, Adjidaumo, and Croghan soils. The Redwater soils are not as sandy in the solum as Adams and Croghan soils. Redwater soils are coarser textured in the subsoil than Adjidaumo soils.

Typical pedon of Redwater fine sandy loam, in the town of Louisville, St. Lawrence County, about 30 feet south of the Grasse River, and 1,200 feet east of the Town Line Road Bridge; USGS Chase Mills topographic quadrangle, lat. 44 degrees 50 minutes 43 seconds N., and long. 75 degrees 04 minutes 30 seconds W., NAD27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; slightly acid; abrupt smooth boundary.

Bw1—7 to 19 inches; dark brown (10YR 3/3) fine sandy loam; weak fine and medium subangular blocky structure; friable; many very fine, fine, and medium roots and few coarse roots; many fine vesicular pores and few fine medium and coarse tubular pores; many coarse faint very dark grayish brown (10YR 3/2) areas of iron depletion, and common fine faint dark yellowish brown (10YR 4/6) soft masses of iron oxide; slightly acid; clear smooth boundary.

Bw2—19 to 30 inches; dark brown (10YR 3/3) fine sandy loam; very weak coarse prismatic structure parting to moderate coarse subangular blocky; friable; common fine and medium roots, and few coarse roots; many very fine pores, common fine and medium, and few coarse tubular pores; many coarse faint very dark grayish brown (10YR 3/2) areas of iron depletion, and common medium faint dark yellowish brown (10YR 4/4) soft masses of iron oxide; neutral; clear wavy boundary.

BC—30 to 38 inches; very dark grayish brown (10YR 4/2) and dark brown (10YR 4/3) fine sandy loam; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; friable; common fine and few medium and coarse roots; many fine and few medium tubular pores; common medium faint dark yellowish brown (10YR 4/4), and common fine prominent strong brown (7.5YR 4/6) soft masses of iron oxide, and common fine faint grayish brown (10YR 5/2) areas of iron depletion; slightly acid; clear wavy boundary.

C—38 to 50 inches; grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) fine sandy loam; massive; friable; common fine and few medium and coarse roots; many fine tubular pores; few thin lenses of sand less than 1/2 inch thick; many coarse distinct yellowish brown (10YR 5/4) soft masses of iron oxide; neutral; abrupt smooth boundary.

R—50 inches; hard limestone bedrock.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock ranges from 40 to 60 inches. Rock fragments (mostly gravel-size limestone) range from 0 to 15 percent by volume in the A and B horizons, and from 0 to 50 percent in the C horizon.

The A horizon has hue of 10YR, value 3 or 4, and chroma of 2 or 3. It is silt loam, fine sandy loam, sandy loam, or loam in the fine-earth fraction. Reaction is strongly acid to slightly acid.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is most commonly fine sandy loam and less commonly loam in the fine-earth fraction. Thin subhorizons of silt loam, loamy sand, or loamy fine sand are in some pedons. Reaction is slightly acid or neutral.

The BC horizon has hue of 7.5YR or 10YR, value of 3 or 4, chroma of 2 to 4. It is fine sandy loam or loam in the fine-earth fraction. Reaction is slightly acid or neutral.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. It is fine sandy loam, loamy sand, loamy fine sand, fine sand, or sand in the fine-earth fraction. It is commonly stratified. Reaction is slightly acid or neutral.

Roundabout Series

The Roundabout series consists of very deep, somewhat poorly drained soils on glacial lake plains. These soils formed in silt or very fine sand deposits in freshwater and marine environments. Slopes range from 0 to 3 percent.

Roundabout soils are in a drainage sequence with moderately well drained Nicholville soils. Roundabout soils are commonly adjacent to Swanton, Muskellunge, Hailesboro, and Adjidaumo soils on the landscape. The Roundabout soils do not have the contrasting textures of loamy over clayey as in Swanton soils. Roundabout soils average less than 18 percent clay in the control section, whereas Muskellunge soils have more than 35 percent clay, and Hailesboro soils have between 18 and 35 percent clay. The Roundabout soils have less clay and a lighter-color surface than Adjidaumo soils.

Typical pedon of Roundabout silt loam, in the town of Chazy, Clinton County, about 0.5 mile north of the intersection of Lake Shore Road with Dunn Road, and about 410 feet west of Lake Shore Road, in a cornfield; USGS Beekmantown topographic quadrangle, lat. 44 degrees 50 minutes 23 seconds N., and long. 73 degrees 24 minutes 41 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) silt loam; moderate medium subangular blocky structure parting to moderate medium and fine granular; friable; common medium, fine and very fine roots; common fine and very fine pores; neutral; abrupt smooth boundary.

Bw—9 to 18 inches, light olive brown (2.5Y 5/3) very fine sandy loam; moderate coarse and medium subangular blocky structure; friable; common fine and very fine roots; common fine and very fine pores; many fine distinct yellowish brown (10YR 5/6) soft masses of iron oxides; neutral; clear smooth boundary.

Bg1—18 to 23 inches, grayish brown (2.5Y 5/2) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; common fine and very fine pores; common fine distinct yellowish brown (10YR 5/6) and few fine distinct dark yellowish brown (10YR 4/4) soft masses of iron oxides; neutral; clear smooth boundary.

Bg2—23 to 31 inches, gray (5Y 5/1) very fine sandy loam; moderate medium subangular blocky structure; friable; few very fine roots; common fine and very fine pores; common medium prominent yellowish brown (10YR 5/6) and few fine prominent dark yellowish brown (10YR 4/4) soft masses of iron oxides; neutral; clear smooth boundary.

Cg1—31 to 37 inches, gray (5Y 5/1) silt loam; weak medium platy structure; friable; few fine and very fine pores; common fine prominent yellowish brown (10YR 5/6) and few fine prominent dark yellowish brown (10YR 4/4) soft masses of iron oxides; neutral; abrupt smooth boundary.

Cg2—37 to 45 inches, dark gray (5Y 4/1) silty clay loam; moderate thick and medium platy structure; firm; few fine and very fine pores; few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent dark yellowish brown (10YR 4/4) soft masses of iron oxides; neutral; gradual smooth boundary.

Cg3—45 to 72 inches, dark gray (5Y 4/1) silt loam; massive; firm; neutral.

Thickness of the solum ranges from 16 to 35 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is more than 60 inches. Rock fragments are generally absent, but range up to 4 percent by volume within a depth of 40 inches.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

The B horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4. It is silt loam or very fine sandy loam in the fine earth fraction. Reaction is very strongly acid to slightly acid.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silt loam or very fine sandy loam in the fine earth fraction, and also has thin strata of silty clay loam. Reaction is moderately acid to neutral to a 40 inch depth, and ranges from moderately acid to moderately alkaline below 40 inches.

Runeberg Series

The Runeberg series consists of very deep, very poorly drained soils on glacial ground moraine and toeslopes of drumlins. These soils formed in loamy deposits. Slopes range from 0 to 2 percent.

The Runeberg soils are in a drainage sequence with the well drained Grenville soils, moderately well drained Hogansburg soils, and the somewhat poorly drained Malone soils. Runeberg soils are also near the Peasleeville, Chazy, Ogdensburg, and Cook soils on the landscape. The Runeberg soils have a grayer matrix and are less acid than Peasleeville soils. Runeberg soils are very deep to bedrock whereas Chazy and Ogdensburg soils are moderately deep. Runeberg soils lack the sandy surface and subsoil layers characteristic of Cook soils.

Typical pedon of Runeberg mucky loam, in the town of Beekmantown, Clinton County, about 1,100 feet north of intersection with Jersey Swamp Road and 1,200 feet east of Durand Road on west side of Transmission Line; USGS Beekmantown topographic quadrangle, lat. 44 degrees 45 minutes 31 seconds N., and long. 73 degrees 29 minutes 16 seconds W., NAD27:

A—0 to 9 inches, black (10YR 2/1) mucky loam; dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak fine granular; very friable; many very fine, fine and medium roots; 10 percent rock fragments (including 5 percent cobbles); neutral; clear smooth boundary.

Bw—9 to 17 inches, brown (10YR 4/3) cobbly loam; weak coarse and medium subangular blocky structure; very friable; many very fine, and common fine roots; common fine and very fine, and few medium pores; grayish brown (10YR 5/2) on faces of peds; common medium and coarse distinct light gray (10YR 6/1) areas of iron depletion, and many medium and fine distinct dark yellowish brown (10YR 4/6) soft masses of iron oxides; 15 percent rock fragments (including 5 percent gravel); slightly alkaline; abrupt wavy boundary.

BCg—17 to 22 inches, dark grayish brown (10YR 4/2) sandy loam; moderate thick and medium platy structure; friable; few very fine and fine pores; dark gray (10YR 4/1) on faces of peds; common medium and coarse distinct yellowish brown (10YR 5/6) soft masses of iron oxides, and few coarse distinct light gray (10YR 6/1) areas of iron depletion; 13 percent gravel; slightly alkaline, slightly effervescent; clear smooth boundary.

Cg1—22 to 42 inches, grayish brown (10YR 5/2) fine sandy loam; massive with weak thick and medium plate-like divisions and few very coarse gray (10YR 5/1) separation cracks; friable; few very fine pores; many fine and medium distinct yellowish brown (10YR 5/6) soft masses of iron oxides; 13 percent gravel; moderately alkaline, strongly effervescent; gradual smooth boundary.

Cg2—42 to 72 inches, grayish brown (10YR 5/2) gravelly fine sandy loam; massive; friable; few very fine pores; few fine distinct yellowish brown (10YR 5/6) soft masses of iron oxides, and few medium faint gray (10YR 5/1) areas of iron depletion; 20 percent rock fragments (including 10 percent cobbles); moderately alkaline, strongly effervescent.

Thickness of solum ranges from 22 to 36 inches. Depth to carbonates ranges from 17 to 36 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Coarse fragments range from 3 to 15 percent by volume in the solum and from 3 to 20 percent in the substratum.

Some pedons have an O horizon less than 4 inches thick.

The A horizon has hue of 10YR to 5Y (or it is neutral), value 2 or 3, and chroma of 1. It is sandy loam, fine sandy loam, or loam in the fine earth fraction. Reaction is slightly acid or neutral.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 3. It is sandy loam, fine sandy loam or loam in the fine earth fraction. Reaction is slightly acid to slightly alkaline.

The BC horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It is sandy loam, fine sandy loam or loam in the fine earth fraction. Reaction is slightly acid to slightly alkaline.

The C horizon has hue of 10YR to 5Y, value of 5 or 6, and chroma of 1 to 3. It is sandy loam, fine sandy loam or loam in the fine earth fraction. Reaction is slightly alkaline or moderately alkaline.

Sciota Series

The Sciota series consists of very deep, somewhat poorly drained soils on glacial lake plains and toeslopes of beach ridges. These soils formed in sandy sediments. Slopes range from 0 to 3 percent.

The Sciota soils are in a drainage sequence with somewhat excessively drained Champlain soils and poorly drained Deinache soils. Sciota soils are also near the Wainola, Flackville, Pinconning, Trout River, Malone and Coveytown soils on the landscape. Sciota soils lack a spodic horizon which is characteristic of Wainola soils. The Sciota soils do not have clayey substrata within 40 inches of the surface as in the Flackville and Pinconning soils. Sciota soils are grayer than and not as gravelly as Trout River soils. The Sciota soils have less silt and clay than the loamy Malone soils and the loamy substrata of Coveytown soils.

Typical pedon of Sciota fine sand, in the town of Mooers, Clinton County, about 0.75 mile southeast of junction of LaValley Road with Angelville Road, and 3,000 feet south of LaValley Road, in a cornfield; USGS Mooers topographic quadrangle, lat. 44

degrees, 55 minutes, 41 seconds N., and long. 73 degrees, 31 minutes and 31 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) fine sand, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak fine granular; very friable; many very fine and fine, and few medium roots; moderately acid; abrupt smooth boundary.

Bw1—9 to 14 inches, pale brown (10YR 6/3) and light olive brown (2.5Y 5/3) fine sand; very weak coarse and medium subangular blocky structure; very friable; few very fine roots; common coarse and medium distinct yellowish brown (10YR 5/6) soft masses of iron oxides and few fine and medium distinct light gray (10YR 7/2) areas of iron depletion; neutral; clear smooth boundary.

Bw2—14 to 19 inches, pale brown (10YR 6/3) fine sand; very weak coarse and medium subangular blocky structure; very friable; common fine and medium distinct yellowish brown (10YR 5/6) soft masses of iron oxides and few fine faint light brownish gray (10YR 6/2) areas of iron depletion; slightly acid; clear smooth boundary.

Bw3—19 to 24 inches, mixed pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) fine sand; weak coarse and medium subangular blocky structure; very friable; many coarse and medium distinct yellowish brown (10YR 5/6) and many fine and medium prominent strong brown (7.5YR 5/6) soft masses of iron oxides, and common fine faint light brownish gray (10YR 6/2) areas of iron depletion; slightly acid; clear smooth boundary.

BC—24 to 37 inches, mixed light brownish gray (10YR 6/2) and pale brown (10YR 6/3) fine sand; weak thin and medium platy structure; loose; common medium distinct yellowish brown (10YR 5/6) and common fine distinct brownish yellow (10YR 6/6) soft masses of iron oxides; slightly alkaline; abrupt smooth boundary.

Cg1—37 to 50 inches, dark grayish brown (2.5Y 4/2) loamy fine sand; single grain; very friable; common medium and coarse prominent yellowish brown and dark yellowish brown (10YR 5/4 and 4/4) soft masses of iron oxides; slightly alkaline; clear smooth boundary.

Cg2—50 to 57 inches, dark gray (N 4/0) fine sand; single grain; very friable; few fine and medium distinct very dark gray (N 3/0) organic stains; slightly alkaline; clear smooth boundary.

Cg3—57 to 72 inches, dark gray (N 4/0) sand; single grain; very friable; slightly alkaline.

Thickness of the solum ranges from 18 to 39 inches. Depth to carbonates ranges from 20 to 80 inches. Redoximorphic features occur within 40 inches of the mineral soil surface. Rock fragments are typically absent, but may range up to 2 percent by volume in the lower subsoil and substratum.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is fine sand, loamy fine sand or fine sandy loam in the fine earth fraction. Unless limed, reaction ranges from moderately acid to neutral.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4. It has faint to prominent redox concentrations and depletions. Texture is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from slightly acid to slightly alkaline.

The BC horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4. It has faint to prominent redox concentrations and depletions. Texture is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from slightly acid to slightly alkaline.

The Cg horizon has hue of 10YR or 2.5Y (or it is neutral), value of 3 to 6, and chroma of 0 to 2. It has faint to prominent redox concentrations and depletions. Texture is fine sand, sand or loamy fine sand in the fine earth fraction. Reaction ranges from neutral to moderately alkaline

Stockholm Series

The Stockholm series consists of very deep, poorly drained soils formed in sandy deposits that overlie clayey marine sediments. They are nearly level soils on marine plains. Slopes range from 0 to 3 percent.

Stockholm soils are in a drainage sequence with the moderately well drained Flackville soils. Other associated soils are the Adjidaumo, Muskellunge, Deinache, and Swanton soils. The Stockholm soils have a sandy solum which is lacking in the clayey Adjidaumo and Muskellunge soils. The Stockholm soils have a finer textured substratum than the Deinache soils. The Stockholm soils have a coarser textured solum than the Swanton soils.

Typical pedon of Stockholm loamy fine sand, in the Town of Canton, St. Lawrence County, in an abandoned field 130 feet southeast from a point on County Road 186 that is about .86 mile southwest of the junction of New York Rt. 68 and County Road 186; USGS Rensselaer Falls topographic quadrangle, lat. 44 degrees 37 minutes 17 seconds N., and long. 75 degrees 15 minutes 49 seconds W., NAD27:

Ap—0 to 10 inches; dark brown (7.5YR 3/2) loamy fine sand, brown (7.5YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common fine and medium roots; common medium tubular pores; few medium distinct strong brown (7.5YR 5/6) soft masses of iron oxide; strongly acid; abrupt smooth boundary.

Bhs—10 to 12 inches; dark reddish brown (5YR 3/3) loamy fine sand; weak fine and medium subangular blocky structure; friable; common fine and medium roots; common fine and medium tubular pores; common fine distinct strong brown (7.5YR 5/6) soft masses of iron oxide; few fine nodules; moderately acid; clear wavy boundary.

Bs—12 to 20 inches; 60 percent friable yellowish brown (10YR 5/4) and 40 percent firm dark reddish brown (5YR 3/4) fine sand; weak fine and medium subangular blocky structure; firm parts are cemented and massive; many fine roots; few fine tubular pores and common fine vesicular pores; common medium and coarse distinct strong brown (7.5YR 4/6 and 5/6) soft masses of iron oxide; moderately acid; abrupt wavy boundary.

BCg—20 to 23 inches; light brownish gray (10YR 6/2) fine sand; weak fine and medium subangular blocky structure; friable; common fine roots; few fine tubular and vesicular pores; common medium and coarse distinct strong brown (7.5YR 5/6) soft masses of iron oxide; moderately acid; abrupt broken boundary.

2BCg—23 to 30 inches; gray (10YR 5/1) clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common fine and medium roots along prism faces; common fine and medium vesicular pores; many coarse distinct strong brown (7.5YR 5/6) and common medium distinct yellowish brown (10YR 5/4) soft masses of iron oxide; grayish brown (10YR 5/2) fine sandy loam coatings on faces of prisms; slightly acid; clear irregular boundary.

2Cg—30 to 58 inches; gray (10YR 5/1) clay; moderate coarse prismatic structure; firm; few fine roots on prism faces; many coarse distinct dark brown (10YR 4/3) and few fine distinct dark yellowish brown (10YR 4/6) soft masses of iron oxide; few fine vesicular pores; neutral; clear wavy boundary.

2C—58 to 72 inches; dark brown (10YR 4/3) clay loam; moderate coarse prismatic structure; firm; few fine roots on prism faces; few fine vesicular pores; dark gray (10YR 4/1) prism faces; common coarse faint gray (10YR 5/1) areas of iron depletion, and common fine distinct yellowish brown (10YR 5/6) soft masses of iron oxide; 3 percent rock fragments; neutral.

The thickness of the solum and depth to the underlying fine textured material ranges from 17 to 39 inches. Depth to bedrock is greater than 60 inches. The soil has few or no rock fragments.

The A or Ap horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, loamy sand, loamy fine sand, fine sand, or sand. Reaction ranges from extremely acid to moderately acid, but varies with cultivation and liming practices.

The Bhs horizon has hue of 5YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. Textures are loamy sand, loamy fine sand, fine sand, or sand. Reaction is strongly acid or moderately acid.

The Bs horizon has hue of 5YR or 10YR, value of 3 to 5, chroma of 3 to 6. Textures are loamy sand, loamy fine sand, fine sand, or sand. Reaction is strongly acid or moderately acid.

The BCg horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2. Textures are loamy fine sand or sand with upper part and silty clay or clay in the lower part. Reaction is strongly acid or moderately acid in the upper part and strongly acid to slightly acid in the lower part.

The 2C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It is silty clay loam, clay loam, silty clay, or clay. Reaction ranges from neutral to moderately alkaline.

Summerville Series

The Summerville series consists of shallow, well drained soils on limestone (or dolomitic limestone) bedrock controlled lowlands. They formed in loamy glacial till deposits. Slopes range from 0 to 15 percent.

The Summerville soils are near the Neckrock, Hogansburg, Grenville, Coveytown and Muskellunge soils on the landscape. The shallow Summerville soils are on similar landforms as the moderately deep Neckrock soils. The Summerville soils have bedrock within 20 inches of the surface whereas Hogansburg, Grenville, Coveytown and Muskellunge soils are very deep.

Typical pedon of Summerville loam, in a Neckrock-Summerville complex, strongly sloping, very rocky, in the Town of Chazy, Clinton County, about 0.25 mile south of Ridge Road intersection with Old Route 348, and 70 feet west of Old Route 348 in wooded area; USGS Beekmantown topographic quadrangle, lat. 44 degrees 50 minutes 59 seconds N., and long. 73 degrees 28 minutes 54 seconds W., NAD27:

A—0 to 5 inches, very dark grayish brown (10YR 3/2) loam; moderate fine and medium subangular blocky structure parting to moderate fine and very fine granular; very friable; many fine and very fine, common medium and few coarse roots; 5 percent rock fragments; slightly acid; clear smooth boundary.

Bw—5 to 12 inches, brown (10YR 4/3) loam; moderate medium subangular blocky structure; very friable; many fine, common medium and few coarse roots; 10 percent rock fragments; slightly acid; abrupt smooth boundary.

2R—12 inches, dark gray (N 4/0) massive limestone bedrock.

The thickness of the solum and depth to bedrock range from 10 to 20 inches. Rock fragments range from 0 to 35 percent by volume.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 3. Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine earth fraction. Reaction ranges from slightly acid to moderately alkaline.

The Bw horizon has hue of 5YR to 10YR, value of 2 to 6, and chroma of 3 to 8. Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine earth fraction. Reaction ranges from slightly acid to moderately alkaline.

Some pedons have a BC horizon with hue of 5YR to 10YR, value of 3 to 6, and chroma of 2 to 4. Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine earth fraction. Reaction ranges from slightly acid to moderately alkaline.

Swanton Series

The Swanton series consists of very deep, somewhat poorly drained soils on lake plains and on depressions of uplands. These soils were formed in a loamy mantle over clayey lacustrine sediments. Slopes range from 0 to 3 percent.

Swanton soils are associated with moderately well drained Flackville soils and very poorly drained Pinconning soils. The Swanton soils are also commonly on landscapes adjacent to Muskellunge, Hailesboro, Adjidaumo, Roundabout, and Mino soils. The Swanton soils differ from the Muskellunge, Hailesboro, and Adjidaumo soils in having more sand in the subsoil. Swanton soils differ from the somewhat poorly drained Roundabout and Mino soils in having a clayey substratum within 40 inches deep.

Typical pedon of Swanton very fine sandy loam, in the town of Chazy, Clinton County, about 1,000 feet east of the intersection of Reynolds Road and US Route 9, and about 525 feet south of Reynolds Road in a wooded area; USGS Beekmantown topographic quadrangle, lat. 44 degrees 48 minutes 38 seconds N., and long. 73 degrees 25 minutes 49 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) very fine sandy loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure parting to weak medium granular; very friable; many fine and very fine, common medium, and few coarse roots; slightly acid; abrupt smooth boundary.

Bw1—9 to 17 inches, brown (10YR 5/3) fine sandy loam; weak medium and coarse subangular blocky structure; friable; many fine and very fine, and common medium roots; many fine and medium distinct yellowish brown (10YR 5/6) and common fine distinct dark yellowish brown (10YR 4/4) soft masses of iron oxides, and common fine and medium faint grayish brown (10YR 5/2) areas of iron depletion; neutral; clear smooth boundary.

Bw2—17 to 24 inches, brown (10YR 5/3) fine sandy loam; moderate medium and coarse subangular blocky structure; very friable; few very fine and fine roots; gray (10YR 5/1) on faces of peds; common medium and coarse distinct yellowish brown (10YR 5/6) and common medium faint yellowish brown (10YR 5/4) soft masses of iron oxides; 1 percent rock fragments; neutral; clear smooth boundary.

Bg—24 to 31 inches, grayish brown (10YR 5/2) fine sandy loam; weak coarse and medium subangular blocky structure; friable; few very fine roots; gray (10YR 5/1) on faces of peds; many medium and coarse distinct dark yellowish brown (10YR 4/6) soft masses of iron oxides; neutral; abrupt smooth boundary.

2Cg1—31 to 50 inches, grayish brown (10YR 5/2) silty clay; massive; firm; many medium distinct dark yellowish brown (10YR 4/6) and few fine distinct yellowish brown (10YR 5/6) soft masses of iron oxides; neutral; clear smooth boundary.

2Cg2—50 to 72 inches, dark gray (10YR 4/1) clay; massive; firm; few fine distinct yellowish brown (10YR 5/4) soft masses of iron oxides; slightly alkaline.

Thickness of the solum and depth to underlying clayey material range from 18 to 40 inches. Redoximorphic features occur within 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 3 percent by volume in the solum and are generally absent in the underlying clayey horizons.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 or 2. Texture is sandy loam, fine sandy loam or very fine sandy loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

The Bw horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 1 to 4. Texture is sandy loam, fine sandy loam, or very fine sandy loam in the fine earth fraction, and less commonly loamy fine sand. Reaction ranges from strongly acid to neutral.

The Bg horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 1 or 2. Texture is sandy loam or fine sandy loam in the fine earth fraction, and less commonly loamy fine sand. Reaction ranges from strongly acid to neutral.

The 2C horizon has hue of 10YR to 5GY (or it is neutral), value of 4 to 6, and chroma of 0 to 4. Texture is silty clay loam, silty clay or clay in the fine earth fraction. Reaction ranges from moderately acid to moderately alkaline.

Udifluvents

Udifluvents consist of very deep, well drained soils formed in sediments deposited by rivers and streams. Udifluvents are on the most actively flooded areas of alluvial plains in the county. This unit is named above the series level of classification because of the variability of the soil properties and the composition of the material in which it formed. Slopes range from 0 to 3 percent.

Udifluvents occur in a complex with somewhat poorly and poorly drained Fluvaquents. They are commonly adjacent to Lovewell, Cornish, Medomak, Rumney, Adams and Colton soils on the landscape. Udifluvents have soil profiles that vary in texture, whereas Lovewell, Cornish and Medomak soils have mainly silt loam and very fine sandy loam in the solum, and Rumney soils have mainly sandy loam or loam in the solum. Udifluvents lack spodic development which is characteristic of Adams and Colton soils.

Udifluvents are in areas of floodplains immediately adjacent to rivers and streams. Scouring, cutting, lateral erosion, changing stream channels and redeposition of sediments during frequent flooding are responsible for the variability in composition and properties of Udifluvents. Because of the wide range of texture and other variabilities, a typical pedon of Udifluvents is not provided.

Generally, the surface layer is 3 to 12 inches thick. The depth to bedrock is more than 60 inches. Redoximorphic features may occur within 50 inches of the mineral soil surface. Rock fragments range from 0 to 50 percent by volume.

The surface layer has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 2 or 3. Texture generally ranges from loamy sand to loam in the fine earth fraction. Reaction is very strongly acid to neutral.

The substratum has hue of 7.5YR to 5Y, value of 3 to 5, and chroma of 2 to 6. Texture generally ranges from sand to silty clay loam in the fine earth fraction. Reaction is strongly acid to slightly alkaline.

Udorthents

Udorthents consist of very deep, well drained to somewhat poorly drained loamy sediments resulting from human activity such as use of fill material. Slopes range from 0 to 25 percent.

Udorthents occur on a wide variety of landscapes and soils. They are commonly associated with miscellaneous map units such as landfills.

Because the properties of Udorthents vary from one place to another, a typical pedon is not described.

The surface layer is commonly 2 to 10 inches thick. Depth to bedrock is more than 60 inches. Rock fragments range from 0 to 50 percent.

Generally, the surface layer has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 4. Texture ranges from sandy loam to silt loam in the fine earth fraction. Reaction ranges from very strongly acid to neutral.

The substratum has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 6. Texture ranges from sandy loam to silty clay loam in the fine earth fraction. Reaction ranges from strongly acid to slightly alkaline.

Waddington Series

The Waddington series consists of very deep, somewhat excessively drained soils on outwash plains and beach ridges. These soils formed in gravelly glacial outwash material. Slopes range from 0 to 8 percent.

The Waddington soils occur on landscapes near the Fahey, Coveytown, Croghan, Hogansburg, and Malone soils. The Waddington soils lack redoximorphic features above 30 inch deep in contrast to moderately well drained Fahey soils. Waddington soils lack loamy glacial till deposits within 40 inches and redox concentrations as is characteristic of Coveytown soils. The Waddington soils are more loamy and gravelly than the moderately well drained Croghan soils. Waddington soils were formed in gravelly outwash deposits whereas Hogansburg and Malone soils were formed in loamy till deposits with typically fewer rock fragments.

Typical pedon of Waddington gravelly loam, 3 to 8 percent slope, in the town of Mooers, Clinton County, about 3,500 feet north of the intersection of North Star Road with Hogle Road, and about 10 feet west of Hogle Road in a small gravel pit; USGS Mooers topographic quadrangle, lat. 44 degrees 59 minutes 58 seconds N., and long. 73 degrees 34 minutes 32 seconds W., NAD27:

Ap—0 to 9 inches, very dark grayish brown (10YR 3/2) gravelly loam; weak medium and fine granular structure; very friable; few medium and coarse, and many fine and very fine roots; 15 percent rock fragments; neutral; abrupt smooth boundary.

Bw1—9 to 17 inches, strong brown (7.5YR 4/6) very gravelly fine sandy loam; weak medium and fine subangular blocky structure parting to weak medium granular; very friable; few coarse, and many fine and very fine roots; 35 percent rock fragments; neutral; clear smooth boundary.

Bw2—17 to 26 inches, brown (7.5YR 4/4) very gravelly loam; weak medium subangular blocky structure; friable; many fine and very fine roots; 55 percent rock fragments; neutral; clear irregular boundary.

BC—26 to 31 inches, dark brown (7.5YR 3/4) very gravelly loamy sand; single grain; loose; few fine and very fine roots; 55 percent rock fragments; neutral; clear irregular boundary.

C—31 to 72 inches, mixed dark grayish brown (10YR 4/2), brown (10YR 4/3), and dark yellowish brown (10YR 4/4) extremely gravelly coarse sand; single grain; loose; few very fine roots in upper part; 60 rock fragments; moderately alkaline, strongly effervescent.

The thickness of the solum ranges from 18 to 30 inches. Depth to free carbonates ranges from 10 to 30 inches. Bedrock is deeper than 60 inches. Rock fragments range from 15 to 55 percent by volume in the solum, and from 40 to 65 percent in the C horizon.

The A or Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4. It commonly is sandy loam, fine sandy loam, or loam in the fine earth fraction. Reaction is slightly acid or neutral.

The Bw horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. It commonly is sandy loam, loam, and fine sandy loam in the fine earth fraction. It is neutral or slightly alkaline.

The BC horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. It is loamy sand or sandy loam in the fine earth fraction. Reaction ranges from neutral to moderately alkaline.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. It ranges from coarse sand to loamy sand in the fine earth fraction with varying degrees of stratification. Reaction is slightly alkaline or moderately alkaline.

Wainola Series

The Wainola series consists of very deep, somewhat poorly drained soils on outwash plains and glacial lake shorelines. These soils formed in sandy deposits. Slopes range from 0 to 3 percent.

The Wainola soils are in a drainage sequence with excessively drained and somewhat excessively drained Adams soils, moderately well drained Croghan soils, and poorly drained Deinache soils. The Wainola soils occur on landscapes near the Monadnock, Schroon, Flackville, Swanton, Fahey, and Coveytown soils. Wainola soils are sandier and typically have less rock fragments than the loamy Monadnock and Schroon soils which occur on nearby glacial till landscapes. Wainola soils have less clay in the substratum than Flackville and Swanton soils. The Wainola soils have redoximorphic features within the subsoil and less rock fragments than Fahey soils. Wainola soils do not have a loamy substratum within 40 inches deep as in somewhat poorly drained Coveytown soils.

Typical pedon of Wainola loamy fine sand, in the town of Mooers, Clinton County, about 3,200 feet south-southwest of intersection of LaValley Road and River Road, and about 2,600 feet southwest of A. Gonya farmhouse in brushy woodlot; USGS Mooers topographic quadrangle, lat. -44 degrees 55 minutes 48 seconds N., and long. 73 degrees 31 minutes 40 seconds W., NAD27:

Oi—0 to 1 inches, black (10YR 2/1) slightly decomposed roots and leaves.

A—1 to 4 inches, black (10YR 2/1) loamy fine sand; weak fine granular structure; very friable; many fine and very fine, and common medium roots; very strongly acid; abrupt wavy boundary.

E—4 to 7 inches, mixed brown (7.5YR 5/2 - 60%) and pinkish gray (7.5YR 6/2) fine sand; single grain; loose; many fine and very fine, and few medium roots; very strongly acid; gradual wavy boundary.

Bs1—7 to 10 inches, dark reddish brown (5YR 3/4) loamy fine sand; very weak medium platy structure; common 3/4 inch dusky red (2.5YR 3/2) orstein nodules; friable; many fine and very fine roots; common medium distinct brown (7.5YR 4/4) soft masses of iron oxides; very strongly acid; clear wavy boundary.

Bs2—10 to 12 inches, reddish brown (5YR 4/4) fine sand; single grain; common 1/2" dusky red (2.5YR 3/2) orstein nodules; loose; common fine and very fine roots; common medium distinct brown (7.5YR 5/4) soft masses of iron oxides; strongly acid; clear wavy boundary.

Bs3—12 to 22 inches, strong brown (7.5YR 4/6) fine sand; single grain; few 1/4" orstein nodules; loose; few very fine roots; common fine and medium distinct pinkish gray (7.5YR 6/2) areas of iron depletion, and many medium and coarse distinct light brown (7.5YR 6/4) and common medium faint strong brown (7.5YR 5/6) soft masses of iron oxides; strongly acid; gradual wavy boundary.

BC—22 to 34 inches, brown (10YR 5/3) fine sand; single grain; loose; few very fine roots; common fine prominent strong brown (7.5YR 5/6) soft masses of iron oxides, and few medium faint pinkish gray (7.5YR 6/2) areas of iron depletion; strongly acid; clear wavy boundary.

C—34 to 72 inches, light brownish gray (10YR 6/2) fine sand; single grain; loose; few fine distinct yellowish brown (10YR 5/6) and common medium and coarse distinct brownish yellow (10YR 6/6) soft masses of iron oxides; strongly acid.

The thickness of the solum ranges from 18 to 42 inches. Redoximorphic features occur within the spodic horizon and 20 inches of the mineral soil surface. Depth to bedrock is greater than 60 inches. Rock fragments range from 0 to 5 percent by volume throughout the soil.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from extremely acid to slightly acid.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. It is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

The Bs horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. It is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

The BC horizon has hue of 5YR to 2.5Y, value of 4 to 6 and chroma of 2 to 6. It is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7 and chroma of 2 to 4. It is fine sand or loamy fine sand in the fine earth fraction. Reaction ranges from very strongly acid to slightly acid.

Wegatchie Series

The Wegatchie Series consists of very deep, poorly drained soils on lake plains. These soils formed in silty lacustrine deposits. Slopes range from 0 to 3 percent.

The Wegatchie soils are in a drainage sequence with the somewhat poorly drained Hailesboro soils. They are closely associated with the Dorval, Malone, Munuscong, Roundabout, and Summerville soils. Wegatchie soils have more silt and clay in the solum than the Malone, Munuscong, Roundabout, and Summerville soils and in addition, are deeper to bedrock than the Summerville soils. Wegatchie soils are mineral soils while Dorval soils formed in organic materials.

Typical pedon of Wegatchie silt loam, in the town of Hammond, St. Lawrence County, about 40 feet west of Oakpoint Road and 4,200 feet south of the junction of Oakpoint Road and River Road; USGS Morristown topographic quadrangle, lat. 44 degrees 30 minutes 00 seconds N., and long. 75 degrees 44 minutes 30 seconds W., NAD27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak medium and coarse subangular blocky structure parting to fine and medium granular; friable, slightly sticky; common fine and few medium roots; few fine distinct dark brown (7.5YR 3/4) soft masses of iron oxide; neutral; abrupt smooth boundary.

Bg1—8 to 13 inches; gray (10YR 5/1) clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common fine tubular and vesicular pores, few macropores; few faint silt coats on ped faces; common fine faint grayish brown (2.5Y 5/2) and light brownish gray (2.5Y 6/2) areas of iron depletion, and many fine and medium distinct brown (7.5YR 4/4) soft masses of iron oxide; neutral; abrupt smooth boundary.

Bg2—13 to 19 inches; dark gray (10YR 4/1) silty clay loam; gray (10YR 5/1) ped faces; moderate very fine, fine and medium angular blocky structure; friable; few fine roots; common fine vesicular and tubular pores, few macropores; few faint silt coats on ped faces; many fine and medium distinct brown (7.5YR 5/4), strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) soft masses of iron oxide; neutral; abrupt smooth boundary.

BCg—19 to 40 inches; dark gray (10YR 4/1) silt loam; grayish brown (10YR 5/2) prism faces; moderate coarse prismatic structure; firm; few fine roots on prism faces; many fine and medium tubular and vesicular pores; common fine distinct strong brown (7.5YR 5/8) and many moderate distinct yellowish brown (10YR 5/6) soft masses of iron oxide; slightly alkaline; abrupt smooth boundary.

C—40 to 72 inches; yellowish brown (10YR 5/6) silt loam; many moderate distinct gray (10YR 6/1) silt loam varves; weak medium plate-like divisions; firm; 10 percent rock fragments; slightly alkaline, slightly effervescent.

The thickness of the solum ranges from 20 to 40 inches. The depth to carbonates ranges from 20 to 60 inches. Bedrock is at depths greater than 60 inches. Rock fragments, mostly gravel, range from 0 to 2 percent by volume in the solum and from 0 to 10 percent in the C horizon.

The A horizon is neutral or has hue of 10YR, value of 2 or 3, and chroma of 0 to 2. It is silt loam, very fine sandy loam, loam or their mucky analogs. Reaction ranges from moderately acid to neutral.

The B horizon is neutral or has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 0 to 2. It is silt loam, silty clay loam, clay loam, or very fine sandy loam in the fine earth fraction. Reaction ranges from slightly acid to slightly alkaline.

The BC horizon is neutral or has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 0 to 2. Texture is similar to the B horizon. Reaction is slightly acid to slightly alkaline.

The C horizon has hue of 7.5YR to 5Y, value of 3 to 6; and chroma of 1 to 6. Chroma of 3 to 6 is restricted to depths greater than 30 inches. It is very fine sandy loam, silt loam, clay loam, or silty clay loam in the fine earth fraction, and it is commonly varved. Reaction ranges from neutral to moderately alkaline.

Wonsqueak Series

The Wonsqueak series consists of very deep, very poorly drained soil on ground moraines, outwash plains, lake plains and glacial till plains. These soils formed in organic deposits that are 16 to 51 inches thick over loamy mineral sediments. Slopes range from 0 to 2 percent.

The Wonsqueak soils are commonly adjacent to Bucksport, Runeberg, Cook, Sunapee, Schroon, and Malone soils on the landscape. Wonsqueak soils have organic deposits up to 51 inches deep whereas Bucksport soils have deeper organic deposits. Wonsqueak soils have a thicker organic surface than the very poorly drained Runeberg and Cook soils which are dominantly mineral soils. The Wonsqueak soils also contrast with the dominantly mineral Sunapee, Schroon, and Malone soils in having a dark-colored matrix.

Typical pedon of Wonsqueak muck, in the town of Chazy, Clinton County, 0.8 mile west of Ridge Road at a point 1.25 mile north of the intersection of State Rt. 191 and Ridge Road in woodland; USGS Champlain topographic quadrangle, lat. 44 degrees 54 minutes 21 seconds N., and long. 73 degrees 29 minutes 9 seconds W., NAD27:

Oa1—0 to 7 inches, black (N 2/0) sapric material; moderate fine and medium granular structure; very friable; many fine and very fine, and few medium roots; 5 percent unrubbed fiber; strongly acid (5.2 in H2O); abrupt smooth boundary.

Oa2—7 to 23 inches, very dark brown (10YR 2/2) sapric material; weak very thick platy structure parting to weak medium subangular blocky; friable; common very fine, and few fine roots; 10 percent unrubbed fiber, 5 percent rubbed fiber; strongly acid (5.4 in H2O); clear smooth boundary.

Oa3—23 to 31 inches, very dark brown (10YR 2/2) sapric material; weak medium and coarse subangular blocky structure; friable; few very fine roots; 10 percent unrubbed fiber, 5 percent rubbed fiber; strongly acid (5.4 in H2O); abrupt smooth boundary.

Cg—31 to 72 inches, dark gray (10YR 4/1) silt loam; massive; slightly sticky; neutral.

The depth to the loamy substratum ranges from 16 to 51 inches. Woody fragments in the organic material range from 0 to 20 percent by volume. Rock fragments in the substratum range from 0 to 15 percent by volume.

The surface tier has hue of 2.5YR to 10YR (or it is neutral), value of 2 or 3, and chroma of 0 to 3. It is dominantly sapric material with some pedons having thin layers of hemic or fibric material. Reaction ranges from extremely acid to slightly acid in 0.01M calcium chloride.

The subsurface tier has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly sapric material having thin layers of hemic or fibric material. Reaction ranges from very strongly acid to slightly acid in 0.01M calcium chloride.

The bottom tier has hue of 2.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly sapric material with thin layers of hemic and fibric material in some pedons. Reaction ranges from very strongly acid to slightly acid in 0.01M calcium chloride.

The C horizon has hue of 5YR to 5GY (or it is neutral), value of 3 to 6, and chroma of 0 to 4. Texture ranges from fine sandy loam to silty clay loam in the fine earth fraction. Reaction ranges from strongly acid to neutral.

Formation of the Soils

The first part of this section describes the factors of soil formation and relates them to the formation of soils in the survey area. The second part defines the processes of soil horizon development as they relate to soil formation on Akwesasne.

Factors of Soil Formation

Soils are products of weathering and other physical and chemical processes that act on parent material. The properties of a soil at a given point on the earth depends on the combination of the following factors: the physical and chemical composition of the parent material; climate; plant and animal life; topography; and time. The relative influence of each of these factors differs from place to place, and each modifies the effect of the others. For example, the impact of climate over a given area is tempered by relief or parent material. In many areas, the influence of a single factor is dominant.

Parent Material

Parent material is the unconsolidated earthy material in which soils are formed. It influences the physical, chemical, and mineralogical composition of the soils. It also influences the rate at which soil forming processes will proceed.

Most of the soils on Akwesasne formed in deposits left as a result of continental glaciation. Marine or lacustrine deposits and till are the most extensive types of parent material. Less extensive are glacial outwash, alluvial deposits and organic deposits.

A huge, water body existed during glacial and post-glacial periods. Streams flowing into this lake (and later a sea) dropped their suspended sediment over hundreds of years to form lacustrine and marine deposits. Adjidaumo and Muskellunge are examples of soils developed from this material.

Soils formed in glacial till have a wide range of characteristics as a result of the heterogeneous nature of till deposits, particularly its rock fragments and soil particles. Some soils such as Grenville and Hogansburg soils formed in very deep glacial till deposits and have a dense substratum. In some places, the glacial till is moderately deep or shallow over bedrock. Neckrock and Summerville soils, for example, are moderately deep and shallow respectively to limestone bedrock.

As the glacial ice melted, large quantities of meltwater transported and sorted soil and rock debris. This material is referred to as glacial outwash and was redeposited in layers of sand and gravel on outwash plains, beach ridges, and terraces. Adams and Waddington are examples of soils formed in this material. These soils are coarse textured.

In more recent times, overflowing streams have deposited alluvial material on the floodplains. This material tends to be variable in texture. Examples of soils formed in this material are Lovewell and Fluvaquents soils which formed in medium textured alluvium.

Soils formed in organic deposits are mainly in depressions in the uplands and along the lake plain of the St. Lawrence River. Dorval and Wonsqueak are examples of soils formed in well decomposed organic material.

Topography

The shape of the land surface, the slope, and the position of the land surface as related to the water table have a great influence on the formation of soil. Soils that formed in convex sloping positions where little runoff accumulates are generally well drained and have a bright, unmottled subsoil. Examples of soils in this category are Waddington and Grenville. In level or slightly concave areas, the seasonal high water table is usually closer to the surface for extended periods. This results in gray mottling (redox depletions or other redoximorphic features) close to the surface and commonly a thick, dark surface layer resulting from higher organic matter.

Some soils are wet because they occupy a position where water accumulates and is perched above a restricting layer in the soil. Pinconning soils are an example.

Most local differences in soils are primarily the result of differences in parent material and topography. The table on “relationships between parent material, landscape position, and drainage” provides more information on topographic associations with soil series.

Climate

Climate, particularly temperature and precipitation, is one of the most influential of the soil forming factors. It determines to a large degree the kind of weathering processes that occur. It also affects the growth and kind of vegetation, and the leaching and translocation of weathered material.

Most of Akwesasne has a humid, temperate climate which tends to promote the development of moderately weathered, leached soils. In general, soil temperature is affected by elevation from north to south as well as proximity to the St. Lawrence River. More specific data is in the climate section under “General Nature of the Survey Area”.

Plant and Animal Life

All living organisms, including plants, animals, bacteria, and fungi, influence soil formation. Vegetation is generally responsible for the amount of organic matter and nutrients in the soil and for the color and structure of the surface layer. Earthworms and other burrowing animals help to keep the soil porous and permeable to air and water. Animal waste products aggregate soil particles and improve soil structure. Bacteria and fungi decompose vegetation which releases nutrients for plant use.

Much of Akwesasne was originally under native forest consisting of coniferous and northern hardwood species. The loss of nutrients through leaching is slow under hardwoods because they take up large quantities of bases (nutrients) and return much of them to the soil surface each year as leaf litter. Conifers, such as balsam fir, do not use large amounts of nutrients. Therefore, the soil becomes more acid and leaching is more rapid.

The root zone is shallow in many upland soils making trees susceptible to windthrow. Uprooted trees also cause mixing of soil materials.

Human activities like cultivation have influenced changes in soil properties. Addition of nutrients through fertilizers, mixing soil horizons with plows, and accelerated erosion have affected many soils.

Time

The degree of soil profile development is also affected by time. In geological terms, the parent material in which soils formed on Akwesasne is relatively young. Most of the deposits were left by the last glacier, 12,000 to 14,000 years ago. All soils have not reached the same stage of soil profile development. Soil-forming factors other than age of deposits influence these processes. Hogansburg soils appear to be younger than Adams soils. However, a difference in parent material has caused much of the difference in appearance.

An immature soil is one that has not had enough time to develop distinct horizons. Lovewell soils, for example, were formed in alluvial sediments. They formed on flood plains receiving periodic deposition of soil material from streams interrupting soil development.

Processes of Soil Formation

The soil-forming factors and subsequent processes of soil formation result in the development of different layers, or soil horizons. These soil horizons can be viewed in a vertical cut called a soil profile. The soil profile extends from the surface downward into material that soil-forming processes have altered very little. Most soils contain three major horizons: the A, the B, and the C horizons.

Several processes cause the formation of soil horizons. They include accumulation of organic matter, leaching of soluble salts and minerals, translocation of clay minerals, reduction and transfer of iron, and formation of dense layers in the subsoil (Buol, Hole, and McCracken; 1980).

Organic matter accumulates as plant residue decomposes. This process darkens the surface layer and helps to form the O horizon. It takes a long time to replace this organic matter once it has been lost. The organic matter content of the surface layer of soils on Akwesasne averages about 4 to 5 percent.

For soils to develop a distinct subsoil, some of the lime and other soluble salts must be leached before other soil processes such as translocation of clay minerals can take place. Factors that affect leaching include the kinds of salts originally present, the rate and depth of percolation, type of native vegetation, and the soil texture.

One of the more important processes of soil horizon development in some soils is the translocation of silicate clay minerals. The parent material determines the content of clay minerals in the soil; however, clay content varies from one soil horizon to another. Clay particles are transported (eluviated) downward from the A horizon and redeposited (illuviated) in the B horizon as clay films on ped faces, as linings along pores and root channels, and as coatings on some rock fragments. In some soils, an E horizon has formed by considerable eluviation of clay minerals to the B horizon.

The reduction and transfer of iron compounds occur mainly in the wetter, more poorly drained soils. This process is known as gleying. In poorly drained and very poorly drained soils, such as Munuscong soils, the grayish subsoil indicates the reduction, removal, and transfer of iron. In moderately well drained and somewhat poorly drained soils, such as Hogansburg and Malone soils, yellowish brown and reddish brown mottles indicate the segregation of iron compounds. In these soils, oxidation takes place along with some reduction.

Some soils on Akwesasne have a spodic horizon in the subsoil that is commonly below an E horizon. The spodic horizon is evidence of transported (illuviated) amorphous materials composed of organic matter and aluminum, with or without iron. It is generally dark reddish brown or reddish brown and has a texture of fine sandy loam or sandier. Adams and Croghan are examples of soils with spodic horizons.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

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.

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.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

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, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

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.

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.

Crystalline bedrock A type of hard, massive bedrock that formed under heat and/or pressure without further classification.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

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.

Diamicton A non-genetic term for a non-sorted or poorly sorted sediment that contains a wide range of particle sizes (geology) (19).

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.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecotone. Transition between two or more diverse communities as, for example between forest and grassland.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth’s surface.

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.

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.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon.

The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

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.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

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.

Marine deposit. Material deposited in a sea or brackish-water environment, and exposed when the water level is lowered or the elevation of the land is raised.

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.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottles noted in map unit descriptions are associated with saturated or near-saturated conditions, as in poorly drained soils. These same mottles are described more precisely in the respective series descriptions as redoximorphic features, in the form of depletions or concentrations. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

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:

Very slow less than 0.06 inch
Slow 0.06 to 0.2 inch
Moderately slow 0.2 to 0.6 inch
Moderate 0.6 inch to 2.0 inches
Moderately rapid 2.0 to 6.0 inches
Rapid 6.0 to 20 inches
Very rapid more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential 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.

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:

Extremely acid less than 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.

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.

Root zone. The part of the soil that can be penetrated by plant roots. This zone, as defined in the map unit description, is the average depth that cultivated plant roots occupy during the growing season. Some soils have root zones that are limited by a restrictive layer. In poorly drained soils, excess moisture in the spring retards early root growth. Excessively drained soils may limit roots by lack of moisture in the summer.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

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.

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.

Seasonal high water table. A zone of saturation at the highest average depth during the wettest season. It is at least six inches thick, persists in the soil for more than a few weeks, and is within six feet of the soil surface. The depth to the seasonal high water table implies the degree of wetness in the soil.

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.

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.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

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	3 percent or less
Gently sloping	3 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 35 percent
Very steep	35 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.

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.

Spodic horizon. A dark reddish brown or reddish brown soil layer with fine sandy loam or coarser texture. This layer is a result of illuviated organic matter and aluminum, with or without iron.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

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.

Swale. One of the lowest parts of the landscape where soils tend to be poorly drained.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

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.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier. The fine-grained, dark-colored, winter layer accompanies a coarser, light colored summer layer.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Water-worked (wave-worked) deposits. Material remaining from an ancient shoreline of a lake or sea. Much of the clay and silt particles have been washed out by wave movement leaving behind mostly sand, gravel or cobbles.

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.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1961-90 at MASSENA FAA AP, NY5134)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	24.2	4.3	14.3	54	-30	1	2.13	1.31	2.86	6	16.2
February----	26.5	6.5	16.5	52	-27	3	1.99	1.20	2.70	5	13.9
March-------	37.5	19.1	28.3	71	-13	23	2.15	1.31	2.91	6	10.0
April-------	52.7	32.6	42.6	81	13	147	2.65	1.67	3.54	7	2.7
May---------	66.6	43.8	55.2	89	27	472	2.53	1.63	3.36	7	0.4
June--------	75.3	52.5	63.9	91	36	716	3.12	1.91	4.21	6	0.0
July--------	80.6	57.7	69.1	93	42	904	3.17	1.88	4.33	6	0.0
August------	77.5	55.5	66.5	92	39	821	3.74	2.52	4.85	7	0.0
September---	68.8	47.2	58.0	87	28	539	3.49	2.05	4.77	6	0.0
October-----	56.9	37.0	46.9	79	18	243	2.81	1.57	3.91	6	1.0
November----	42.8	27.7	35.3	70	5	57	3.13	2.23	3.95	8	6.3
December----	28.7	11.7	20.2	57	-23	6	3.19	1.98	4.29	8	19.7
Yearly:											
Average---	53.2	33.0	43.1	---	---	---	---	---	---	---	---
Extreme---	100	-38	---	94	-33	---	---	---	---	---	---
Total-----	---	---	---	---	---	3933	34.11	29.92	38.16	78	70.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at MASSENA FAA AP, NY5134)

Probability	Temperature 24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 27	May 9	May 27
2 year in 10 later than--	April 23	May 5	May 21
5 year in 10 later than--	April 16	April 26	May 10
First freezing temperature in fall:			
1 yr in 10 earlier than--	October 5	September 25	September 15
2 yr in 10 earlier than--	October 10	September 30	September 19
5 yr in 10 earlier than--	October 21	October 9	September 27

Table 3.—Growing Season

(Recorded for the period 1961-90 at MASSENA FAA AP, NY5134)

Probability	Daily Minimum Temperature During growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	165	143	117
8 years in 10	173	151	124
5 years in 10	188	165	139
2 years in 10	203	179	153
1 year in 10	211	187	161

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2	Lovewell very fine sandy loam, stratified substratum	11	*
5	Fluvaquents-Udifluvents complex, frequently flooded	28	0.2
6	Redwater fine sandy loam	3	*
15B	Waddington gravelly loam, 3 to 8 percent slopes	2	*
18A	Adams loamy sand, 0 to 3 percent slopes	23	0.2
18B	Adams loamy sand, 3 to 8 percent slopes	21	0.2
20A	Croghan loamy fine sand, 0 to 3 percent slopes	69	0.5
33	Wainola loamy fine sand	73	0.5
39A	Churchville silty clay loam, 0 to 3 percent slopes	731	5.5
39B	Churchville silty clay loam, 3 to 8 percent slopes	274	2.0
40B	Heuvelton silty clay loam, 3 to 8 percent slopes	27	0.2
40C	Heuvelton silty clay loam, 8 to 15 percent slopes	2	*
41A	Muskellunge silty clay loam, 0 to 3 percent slopes	871	6.5
41B	Muskellunge silty clay loam, 3 to 8 percent slopes	57	0.4
42	Adjidaumo silty clay	2,701	20.2
43	Adjidaumo mucky silty clay	1,655	12.4
44	Mino loam	6	*
45	Sciota fine sand	37	0.3
46	Deinache fine sand	33	0.2
47B	Elmwood fine sandy loam, 3 to 8 percent slopes	12	*
48	Swanton very fine sandy loam	78	0.6
49	Munuscong mucky fine sandy loam	233	1.7
50	Hailesboro silt loam	102	0.8
51	Wegatchie silt loam	151	1.1
53B	Nicholville very fine sandy loam, 3 to 8 percent slopes	7	*
60C	Grenville loam, 8 to 15 percent slopes	41	0.3
61B	Hogansburg loam, 3 to 8 percent slopes	691	5.2
62A	Malone gravelly loam, 0 to 3 percent slopes	65	0.5
62B	Malone gravelly loam, 3 to 8 percent slopes	23	0.2
64	Runeberg mucky loam	13	*
66	Matoon silty clay loam, 0 to 2 percent slopes	37	0.3
68B	Fahey gravelly fine sandy loam, 3 to 8 percent slopes, loamy substratum	7	*
69A	Coveytown loamy sand, 0 to 3 percent slopes	4	*
70	Guff silty clay loam	58	0.4
94B	Neckrock-Summerville complex, gently sloping, rocky	53	0.4
94C	Neckrock-Summerville complex, strongly sloping, rocky	5	*
101	Wonsqueak muck	28	0.2
104	Udorthents, wet substratum	56	0.4
105	Udorthents, smoothed	15	0.1
107	Udorthents, loamy	47	0.4
110	Borosaprists and Fluvaquents, frequently flooded	29	0.2
144	Roundabout silt loam	12	*
147A	Flackville loamy fine sand, 0 to 3 percent slopes	128	1.0
147B	Flackville loamy fine sand, 3 to 8 percent slopes	60	0.4
148	Stockholm loamy fine sand	250	1.9
149	Pinconning mucky loamy fine sand	92	0.7
181	Dorval muck	202	1.5
260C	Grenville loam, strongly sloping, very stony	122	0.9
261B	Hogansburg loam, gently sloping, very stony	1,880	14.0
263B	Malone gravelly loam, gently sloping, very stony	855	6.4
264	Runeberg mucky loam, very stony	71	0.5
270B	Coveytown loamy sand, gently sloping, very stony	4	*
W	Water	1,345	10.0
	Total	13,400	100.0

* Less than 0.1 percent.

Table 5.–Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture
		Tons	Bu	Tons	Tons	AUM
2:						
Lovewell, stratified substratum	2w	4.50	140.00	25.00	4.50	7.50
5:						
Fluvaquents, frequently flooded	5w	---	---	---	---	---
Fluvaquents, frequently flooded	5w	---	---	---	---	3.00
Udifluvents, frequently flooded	5w	---	---	---	---	2.50
6:						
Redwater	3w	3.00	100.00	16.00	3.50	5.00
15B:						
Waddington	3s	4.50	130.00	18.00	4.00	7.00
18A:						
Adams	3s	2.00	---	12.00	2.50	3.00
18B:						
Adams	3s	2.00	---	12.00	2.50	3.00
20A:						
Croghan	2w	3.00	---	14.00	3.00	5.00
33:						
Wainola	3w	---	100.00	14.00	3.00	5.50
39A:						
Churchville	3w	---	100.00	16.00	3.00	5.00
39B:						
Churchville	3w	---	100.00	16.00	3.00	5.00
40B:						
Heuvelton	2e	4.50	110.00	20.00	4.00	7.50
40C:						
Heuvelton	3e	4.00	110.00	18.00	3.50	7.00
41A:						
Muskellunge	3w	3.00	120.00	17.00	3.50	5.50
41B:						
Muskellunge	3w	3.00	120.00	17.00	3.50	5.50
42:						
Adjidaumo	4w	---	---	15.00	3.00	2.50
43:						
Adjidaumo, mucky silty clay	5w	---	---	---	---	2.00
44:						
Mino	3w	3.50	120.00	18.00	3.50	5.50

Table 5.—Land Capability and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture
		Tons	Bu	Tons	Tons	AUM
45:						
Sciota	3w	---	100.00	12.00	3.00	5.00
46:						
Deinache	4w	---	---	12.00	3.00	4.00
47B:						
Elmwood	2w	4.00	---	22.00	4.00	8.00
48:						
Swanton	3w	3.00	120.00	18.00	3.00	5.50
49:						
Munuscong	5w	---	---	---	---	---
50:						
Hailesboro	3w	3.50	100.00	18.00	3.00	5.50
51:						
Wegatchie	4w	---	---	10.00	3.00	2.50
53B:						
Nicholville	2e	4.50	120.00	20.00	4.00	7.50
60C:						
Grenville	3e	5.50	130.00	25.00	4.50	8.50
61B:						
Hogansburg	2e	4.50	125.00	24.00	4.00	7.50
62A:						
Malone	3w	2.50	100.00	16.00	2.50	5.00
62B:						
Malone	3w	2.50	100.00	16.00	2.50	5.00
64:						
Runeberg	5w	---	---	---	---	2.50
66:						
Matoon	3w	---	90.00	15.00	3.00	5.50
68B:						
Fahey	2w	---	---	14.00	3.00	5.00
69A:						
Coveytown	3w	3.50	120.00	15.00	3.00	5.50
70:						
Guff	4w	---	---	---	---	2.50
94B:						
Neckrock	6s	---	---	---	---	4.00
Summerville	6s	---	---	---	---	2.00
94C:						
Neckrock	6s	---	---	---	---	4.00
Summerville	6s	---	---	---	---	2.00
101:						
Wonsqueak	7w	---	---	---	---	---

Table 5.—Land Capability and Yields per Acre of Crops and Pasture—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Corn	Corn silage	Grass-legume hay	Pasture
		Tons	Bu	Tons	Tons	AUM
104:						
Udorthents, wet substratum	---	---	---	---	---	---
105:						
Udorthents, smoothed	---	---	---	---	---	---
107:						
Udorthents, Loamy	---	---	---	---	---	---
110:						
Borosaprists	8	---	---	---	---	---
Fluvaquents	5w	---	---	---	---	---
144:						
Roundabout	3w	3.50	120.00	18.00	3.50	5.50
147A:						
Flackville	2w	3.50	110.00	18.00	4.00	7.50
147B:						
Flackville	2w	4.00	140.00	18.00	4.00	7.50
148:						
Stockholm	4w	---	---	14.00	3.00	4.50
149:						
Pinconning	5w	---	---	---	---	2.50
181:						
Dorval	5w	---	---	---	---	---
260C:						
Grenville, very stony	6s	---	---	---	---	3.50
261B:						
Hogansburg, very stony	6s	---	---	---	---	3.50
263B:						
Malone, very stony	7s	---	---	---	---	3.50
264:						
Runeberg, very stony	6s	---	---	---	---	2.00
270B:						
Coveytown, very stony	7s	---	---	---	---	3.50
W:						
Water	---	---	---	---	---	---

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
2	Lovewell very fine sandy loam, stratified substratum
6	Redwater fine sandy loam (Prime farmland if drained)
40B	Heuvelton silty clay loam, 3 to 8 percent slopes
41A	Muskellunge silty clay loam, 0 to 3 percent slopes (Prime farmland if drained)
41B	Muskellunge silty clay loam, 3 to 8 percent slopes (Prime farmland if drained)
44	Mino loam (Prime farmland if drained)
47B	Elmwood fine sandy loam, 3 to 8 percent slopes
48	Swanton very fine sandy loam (Prime farmland if drained)
50	Hailesboro silt loam (Prime farmland if drained)
61B	Hogansburg loam, 3 to 8 percent slopes
62A	Malone gravelly loam, 0 to 3 percent slopes (Prime farmland if drained)
62B	Malone gravelly loam, 3 to 8 percent slopes (Prime farmland if drained)
66	Matoon silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
144	Roundabout silt loam (Prime farmland if drained)
147A	Flackville loamy fine sand, 0 to 3 percent slopes
147B	Flackville loamy fine sand, 3 to 8 percent slopes

Table 7.—Soil Rating for Small Fruit
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
2:	
Lovewell, stratified substratum	0.857 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.961 Very favorable texture 0.750 Favorable - few or no stones + 0.420 Fair (pH)
5:	
Fluvaquents, frequently flooded	not rated
Fluvaquents, frequently flooded	not rated
Udifluvents, frequently flooded	not rated
6:	
Redwater	0.691 Fair for most small fruit + 1.000 Very favorable texture 0.750 Favorable - few or no stones + 0.420 Fair (pH) 0.000 Drainage not favorable for most small fruit
15B:	
Waddington	0.804 Favorable for most small fruit + 1.000 Very favorable texture 0.750 Somewhat favorable (drainage) 0.750 Favorable - few or no stones + 0.719 Favorable (pH)
18A:	
Adams	0.714 Fair for most small fruit + 0.750 Somewhat favorable (drainage) 0.750 Favorable - few or no stones + 0.600 Favorable (texture) 0.000 Poor (pH is too low or high)
18B:	
Adams	0.714 Fair for most small fruit + 0.750 Somewhat favorable (drainage) 0.750 Favorable - few or no stones + 0.600 Favorable (texture) 0.000 Poor (pH is too low or high)

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
20A:	
Croghan	0.734 Fair for most small fruit + 1.000 Favorable (soil drainage) 0.750 Favorable - few or no stones + 0.156 Poor (too sandy or clayey) 0.000 Poor (pH is too low or high)
33:	
Wainola	0.611 Fair for most small fruit + 0.750 Favorable - few or no stones + 0.459 Fair (texture) 0.000 Poor (pH is too low or high) 0.000 Drainage not favorable for most small fruit
39A:	
Churchville	0.631 Fair for most small fruit + 0.830 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
39B:	
Churchville	0.631 Fair for most small fruit + 0.830 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
40B:	
Heuvelton	0.807 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey)
40C:	
Heuvelton	0.807 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey)

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
41A:	
Muskellunge-----	0.555 Fair for most small fruit + 0.750 Favorable - few or no stones + 0.087 Somewhat poor (pH) 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
41B:	
Muskellunge-----	0.555 Fair for most small fruit + 0.750 Favorable - few or no stones + 0.087 Somewhat poor (pH) 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
42:	
Adjidaumo-------	0.479 Poor for most small fruit + 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
43:	
Adjidaumo, mucky silty clay-----	0.479 Poor for most small fruit + 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
44:	
Mino------------	0.721 Fair for most small fruit + 1.000 Very favorable texture 0.750 Favorable - few or no stones + 0.719 Favorable (pH) 0.000 Drainage not favorable for most small fruit
45:	
Sciota----------	0.661 Fair for most small fruit + 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.156 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
46:	
Deinache--------	0.404 Poor for most small fruit + 0.750 Favorable - few or no stones + 0.156 Poor (too sandy or clayey) 0.031 Somewhat poor (pH) 0.000 Drainage not favorable for most small fruit
47B:	
Elmwood---------	0.916 Very favorable for small fruit + 1.000 Very favorable texture 1.000 Favorable (soil drainage) 0.997 Very favorable - good pH 0.750 Favorable - few or no stones +
48:	
Swanton---------	0.750 Fair for most small fruit + 1.000 Very favorable texture 0.997 Very favorable - good pH 0.750 Favorable - few or no stones + 0.000 Drainage not favorable for most small fruit
49:	
Munuscong-------	0.510 Poor for most small fruit + 1.000 Very favorable texture 0.750 Favorable - few or no stones + 0.281 Fair (pH) 0.000 Drainage not favorable for most small fruit
50:	
Hailesboro------	0.674 Fair for most small fruit + 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.248 Fair (texture) 0.000 Drainage not favorable for most small fruit
51:	
Wegatchie-------	0.489 Poor for most small fruit + 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.116 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
53B:	
Nicholville-----	0.857 Favorable for most small fruit + 1.000 Very favorable texture 1.000 Favorable (soil drainage) 0.750 Favorable - few or no stones + 0.420 Fair (pH)

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
60C:	
Grenville	0.916 Very favorable for small fruit + 1.000 Very favorable texture 1.000 Favorable (soil drainage) 0.997 Very favorable - good pH 0.750 Favorable - few or no stones + 0.580 Favorable (pH)
61B:	
Hogansburg	0.874 Favorable for most small fruit + 1.000 Very favorable texture 1.000 Favorable (soil drainage) 0.750 Favorable - few or no stones +
62A:	
Malone	0.747 Fair for most small fruit + 1.000 Very favorable texture 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.000 Drainage not favorable for most small fruit
62B:	
Malone	0.747 Fair for most small fruit + 1.000 Very favorable texture 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.000 Drainage not favorable for most small fruit
64:	
Runeberg	0.540 Poor for most small fruit + 1.000 Very favorable texture 0.750 Favorable - few or no stones + 0.580 Favorable (pH) 0.000 Drainage not favorable for most small fruit
66:	
Matoon	0.620 Fair for most small fruit + 0.750 Favorable - few or no stones + 0.719 Favorable (pH) 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
68B:	
Fahey	0.817 Favorable for most small fruit + 1.000 Very favorable texture 1.000 Favorable (soil drainage) 0.750 Favorable - few or no stones + 0.031 Somewhat poor (pH)

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation:
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
69A:	
Coveytown-------	0.741 Fair for most small fruit + 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.730 Favorable (texture) 0.000 Drainage not favorable for most small fruit
70:	
Guff------------	0.473 Poor for most small fruit + 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.010 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit
94B:	
Neckrock--------	0.857 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.750 Favorable - few or no stones + 0.719 Favorable (pH) 0.500 Fair (texture)
Summerville-----	0.788 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.997 Very favorable - good pH 0.961 Very favorable texture 0.750 Favorable - few or no stones +
94C:	
Neckrock--------	0.857 Favorable for most small fruit + 1.000 Favorable (soil drainage 0.750 Favorable - few or no stones + 0.719 Favorable (pH) 0.500 Fair (texture)
Summerville-----	0.788 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.997 Very favorable - good pH 0.961 Very favorable texture 0.750 Favorable - few or no stones +
101:	
Wonsqueak-------	0.407 Poor for most small fruit *+ 0.750 Favorable - few or no stones + 0.281 Fair (pH) *+ 0.000 Poor (too sandy or clayey) 0.000 Drainage not favorable for most small fruit

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
104:	
Udorthents, wet substratum	not rated
105:	
Udorthents, smoothed	not rated
107:	
Udorthents, Loamy	not rated
110:	
Borosaprists	not rated
Fluvaquents	not rated
144:	
Roundabout	0.741 Fair for most small fruit + 1.000 Very favorable texture 0.913 Very favorable - good pH 0.750 Favorable - few or no stones + 0.000 Drainage not favorable for most small fruit
147A:	
Flackville	0.877 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.459 Fair (texture)
147B:	
Flackville	0.877 Favorable for most small fruit + 1.000 Favorable (soil drainage) 0.969 Very favorable - good pH 0.750 Favorable - few or no stones + 0.459 Fair (texture)
148:	
Stockholm	0.447 Poor for most small fruit + 0.750 Favorable - few or no stones + 0.459 Fair (texture) 0.031 Somewhat poor (pH) 0.000 Drainage not favorable for most small fruit
149:	
Pinconning	0.504 Poor for most small fruit + 0.750 Favorable - few or no stones + 0.580 Favorable (pH) 0.459 Fair (texture) 0.000 Drainage not favorable for most small fruit

Table 7.—Soil Rating for Small Fruit—continued
Akwesasne Territory: St. Regis Mohawk Reservation
Detailed Soil Map Legend

Map symbol and soil name	Relative rating for some soil properties
181:	
Dorval	0.407 Poor for most small fruit *+
	0.750 Favorable - few or no stones +
	0.281 Fair (pH) *+
	0.000 Poor (too sandy or clayey)
	0.000 Drainage not favorable for most small fruit
260C:	
Grenville, very stony	0.716 Fair for most small fruit +
	1.000 Very favorable texture
	1.000 Favorable (soil drainage)
	0.997 Very favorable - good pH
	0.150 Poor - too stony
261B:	
Hogansburg, very stony	0.674 Fair for most small fruit +
	1.000 Very favorable texture
	1.000 Favorable (soil drainage)
	0.580 Favorable (pH)
	0.150 Poor - too stony
263B:	
Malone, very stony	0.547 Poor for most small fruit +
	1.000 Very favorable texture
	0.969 Very favorable - good pH
	0.150 Poor - too stony
	0.000 Drainage not favorable for most small fruit
264:	
Runeberg, very stony	0.340 Poor for most small fruit +
	1.000 Very favorable texture
	0.580 Favorable (pH)
	0.150 Poor - too stony
	0.000 Drainage not favorable for most small fruit
270B:	
Coveytown, very stony	0.541 Poor for most small fruit +
	0.913 Very favorable - good pH
	0.730 Favorable (texture)
	0.150 Poor - too stony
	0.000 Drainage not favorable for most small fruit
W:	
Water	not rated

All values are rounded.
* Indicates null data was used.
+ Indicates default values were used.

Table 8.—Forestland Management and Productivity

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber (cu ft/ac)	Trees to manage
2:										
Lovewell, stratified substratum	10A	Slight	Slight	Slight	Moderate	Moderate	eastern white pine	75	143	European larch, eastern white pine, red spruce, white spruce
							balsam fir	65	129	
							red maple	62	43	
5:										
Fluvaquents, frequently flooded	—	—	—	—	—	—	—	—	—	—
Fluvaquents, frequently flooded	—	—	—	—	—	—	—	—	—	—
Udifluvents, frequently flooded	—	—	—	—	—	—	—	—	—	—
6:										
Redwater	3W	Slight	Moderate	Slight	Slight	—	red maple	70	43	Norway spruce, white spruce
							quaking aspen	—	—	
							eastern cottonwood	—	—	
							yellow birch	—	—	
15B:										
Waddington	3F	Slight	Slight	Moderate	Slight	—	sugar maple	60	43	eastern white pine, red pine
							northern red oak	70	57	
							American beech	—	—	
							American basswood	—	—	
18A:										
Adams	3S	Slight	Slight	Severe	Slight	—	eastern white pine	70	129	balsam fir, eastern white pine, red spruce
							red pine	55	86	
							balsam fir	50	114	
18B:										
Adams	3S	Slight	Slight	Severe	Slight	—	eastern white pine	70	129	balsam fir, eastern white pine, red spruce
							red pine	55	86	
							balsam fir	50	114	
20A:										
Croghan	10S	Slight	Slight	Moderate	Slight	—	eastern white pine	65	114	European larch, Norway spruce, eastern white pine
							sugar maple	55	29	
							red maple	—	—	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to manage
									cu ft/ac	
33:										
Wainola	6W	Slight	Severe	Moderate	Severe	Severe	red maple	60	43	eastern white pine, white spruce, Norway spruce
							quaking aspen	75	86	
							white ash	68	57	
							paper birch	63	72	
39A:										
Churchville	3W	Slight	Moderate	Slight	Moderate	—	sugar maple	60	43	eastern arborvitae, eastern white pine
							eastern white pine	75	143	
							northern red oak	70	57	
							yellow birch	—	—	
39B:										
Churchville	3W	Slight	Moderate	Slight	Moderate	—	sugar maple	60	43	eastern arborvitae, eastern white pine
							eastern white pine	75	143	
							northern red oak	70	57	
							yellow birch	—	—	
40B:										
Heuvelton	2A	Slight	Slight	Slight	Slight	—	northern red oak	70	57	eastern white pine, white spruce
							sugar maple	65	43	
							eastern white pine	75	143	
							white ash	—	—	
40C:										
Heuvelton	2R	Moderate	Slight	Slight	Slight	—	northern red oak	70	57	eastern white pine, white spruce
							sugar maple	65	43	
							eastern white pine	75	143	
							white ash	—	—	
41A:										
Muskellunge	3W	Slight	Moderate	Slight	Slight	—	sugar maple	65	43	European larch, Norway spruce, eastern white pine, white spruce
							northern red oak	70	57	
							eastern white pine	75	143	
							red maple	70	43	
41B:										
Muskellunge	3W	Slight	Moderate	Slight	Slight	—	sugar maple	65	43	European larch, Norway spruce, eastern white pine, white spruce
							northern red oak	70	57	
							eastern white pine	75	143	
							red maple	70	43	
42:										
Adjidaumo	2W	Slight	Severe	Severe	Severe	—	red maple	50	29	eastern arborvitae, eastern white pine, white spruce
							black ash	—	—	
							eastern white pine	55	86	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to manage
									cu ft/ac	
43:										
Adjidaumo, mucky silty clay	2W	Slight	Severe	Severe	Severe	—	red maple	50	29	eastern arborvitae, eastern white pine, white spruce
							black ash	—	—	
							eastern white pine	55	86	
44:										
Mino	3W	Slight	Moderate	Moderate	Moderate	—	white ash	69	43	European larch, eastern white pine, white spruce
							northern red oak	70	57	
							eastern white pine	75	10	
45:										
Sciota	3W	Slight	Moderate	Moderate	Moderate	—	red maple	60	43	eastern arborvitae, eastern white pine, white spruce
							eastern arborvitae	—	—	
							eastern white pine	65	114	
46:										
Deinache	2W	Slight	Severe	Severe	Severe	Severe	red maple	55	29	eastern white pine, white spruce
							eastern white pine	—	—	
							eastern arborvitae	—	—	
47B:										
Elmwood	8A	Slight	Slight	Slight	Moderate	Moderate	eastern white pine	66	114	eastern white pine, red pine, white spruce
							sugar maple	62	43	
							northern red oak	70	57	
48:										
Swanton	7W	Slight	Severe	Severe	Severe	Severe	eastern white pine	70	129	eastern white pine, white spruce
							red maple	57	29	
							white spruce	45	100	
							balsam fir	45	100	
49:										
Munuscong	3W	Slight	Severe	Severe	Severe	Severe	quaking aspen	50	43	eastern white pine, white spruce
							balsam fir	—	—	
							red maple	—	—	
							paper birch	—	—	
							black ash	—	—	
							tamarack	—	—	
							black spruce	—	—	
							eastern arborvitae	—	—	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
									cu ft/ac	
50:										
Hailesboro	3W	Slight	Moderate	Moderate	Moderate	—	white ash	70	43	eastern white pine, white spruce
							northern red oak	70	57	
							eastern white pine	75	143	
							red maple	57	43	
51:										
Wegatchie	2W	Slight	Severe	Severe	Severe	—	red maple	50	29	black ash
							white ash	—	—	
							quaking aspen	—	—	
							yellow birch	—	—	
53B:										
Nicholville	3A	Slight	Slight	Slight	Slight	—	sugar maple	65	43	eastern white pine, white spruce
							northern red oak	70	57	
							eastern white pine	75	143	
60C:										
Grenville	3A	Slight	Slight	Slight	Slight	Slight	sugar maple	70	43	black cherry, black walnut, eastern white pine
							northern red oak	70	57	
							American basswood	75	43	
							eastern white pine	75	143	
							black cherry	—	—	
61B:										
Hogansburg	3A	Slight	Slight	Slight	Slight	—	sugar maple	65	43	eastern white pine, white spruce
							eastern white pine	75	143	
							American basswood	—	—	
							white ash	75	43	
62A:										
Malone	3W	Slight	Moderate	Moderate	Moderate	—	red maple	60	43	eastern white pine, white spruce
							northern red oak	—	—	
							eastern arborvitae	—	—	
							yellow birch	—	—	
62B:										
Malone	3W	Slight	Moderate	Moderate	Moderate	—	red maple	60	43	eastern white pine, white spruce
							northern red oak	—	—	
							eastern arborvitae	—	—	
							yellow birch	—	—	
64:										
Runeberg	5W	Slight	Severe	Severe	Severe	Severe	eastern arborvitae	45	72	balsam fir, eastern arborvitae
							red maple	60	43	
							black ash	—	—	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to manage
									cu ft/ac	
66:										
Matoon	3W	Slight	Severe	Slight	Moderate	—	red maple	60	43	white spruce, yellow birch
							white ash	—	—	
							eastern white pine	—	—	
							northern red oak	—	—	
68B:										
Fahey	8A	Slight	Slight	Slight	Slight	Slight	eastern white pine	65	114	eastern white pine, red pine, white spruce
							northern red oak	60	43	
							sugar maple	55	29	
69A:										
Coveytown	2W	Slight	Moderate	Moderate	Moderate	—	red maple	55	29	eastern white pine, white spruce
							eastern white pine	65	114	
70:										
Guff	2W	Slight	Severe	Severe	Severe	Severe	red maple	—	29	black ash
							white ash	—	—	
							American elm	—	—	
94B:										
Neckrock	—	—	—	—	—	—	sugar maple	65	43	eastern arborvitae, eastern white pine
							eastern arborvitae	—	—	
							white ash	—	—	
Summerville	—	—	—	—	—	—	sugar maple	57	29	eastern arborvitae, eastern white pine, white spruce
							paper birch	53	57	
							American beech	—	—	
							eastern white pine	50	86	
							quaking aspen	—	—	
							eastern arborvitae	—	—	
							balsam fir	—	—	
107:										
Udorthents, Loamy	—	—	—	—	—	—	—	—	—	—
110:										
Borosaprists	—	—	—	—	—	—	—	—	—	—
Fluvaquents	—	—	—	—	—	—	—	—	—	—

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
									cu ft/ac	
144:										
Roundabout	9W	Slight	Severe	Moderate	Severe	Severe	eastern white pine	75	143	European larch, balsam fir, eastern white pine, white spruce
							balsam fir	55	114	
							red maple	55	29	
							gray birch	—	129	
147A:										
Flackville	3S	Slight	Slight	Slight	Slight	—	sugar maple	60	43	eastern white pine, white spruce
							northern red oak	60	43	
							eastern white pine	70	129	
							black cherry	—	—	
147B:										
Flackville	3S	Slight	Slight	Slight	Slight	—	eastern white pine	70	129	Norway spruce, eastern white pine, white spruce
							northern red oak	60	43	
							sugar maple	60	43	
148:										
Stockholm	3W	Slight	Moderate	Moderate	Moderate	—	red maple	75	43	eastern white pine, white spruce
							eastern white pine	65	114	
							eastern hemlock	60	—	
							yellow birch	—	—	
94C:										
Neckrock	3D	Slight	Slight	Slight	Slight	—	sugar maple	65	43	eastern arborvitae, eastern white pine
							eastern arborvitae	—	—	
							white ash	—	—	
Summerville	2D	Slight	Moderate	Moderate	Severe	Slight	sugar maple	57	29	eastern arborvitae, eastern white pine, white spruce
							paper birch	53	57	
							American beech	—	—	
							eastern white pine	50	86	
							quaking aspen	—	—	
							eastern arborvitae	—	—	
							balsam fir	—	—	
101:										
Wonsqueak	2W	Slight	Severe	Severe	Severe	Severe	black spruce	20	29	black spruce, tamarack
							tamarack	—	—	
							eastern arborvitae	—	—	
							balsam fir	—	—	
							quaking aspen	—	—	
							red maple	—	—	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
104:										
Udorthents, wet substratum	—	—	—	—	—	—	—	—	—	—
105:										
Udorthents, smoothed	—	—	—	—	—	—	—	—	—	—
149:										
Pinconning	3W	Slight	Severe	Severe	Severe	Severe	quaking aspen	50	43	black ash, eastern arborvitae
							black ash	—	—	
							eastern arborvitae	—	—	
							red maple	55	29	
							paper birch	—	—	
181:										
Dorval	2W	Slight	Severe	Severe	Severe	—	red maple	50	29	eastern arborvitae, white spruce
							white ash	—	—	
							eastern arborvitae	—	—	
							American elm	—	—	
260C:										
Grenville, very stony	3X	Slight	Slight	Slight	Slight	Slight	sugar maple	70	43	Austrian pine, Douglas fir, European larch, Norway spruce, black walnut, eastern white pine
							northern red oak	70	57	
							American basswood	75	43	
							eastern white pine	75	143	
261B:										
Hogansburg, very stony	3A	Slight	Slight	Slight	Slight	—	sugar maple	65	43	eastern white pine, white spruce
							eastern white pine	75	143	
							white ash	75	43	
							American basswood	—	—	
263B:										
Malone, very stony	3W	Slight	Moderate	Moderate	Moderate	—	red maple	60	43	eastern white pine, white spruce
							northern red oak	—	—	
							eastern arborvitae	—	—	
							yellow birch	—	—	
264:										
Runeberg, very stony	3W	Slight	Severe	Severe	Severe	Severe	eastern arborvitae	45	72	black ash, eastern arborvitae, white spruce
							red maple	60	43	
							black ash	—	—	

Table 8.—Forestland Management and Productivity—continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
									cu ft/ac	
270B:										
Coveytown, very stony	2W	Slight	Moderate	Moderate	Moderate	—	red maple	55	29	eastern arborvitae, white spruce
							eastern white pine	65	114	
							yellow birch	—	—	
W:										
Water	—	—	—	—	—	—	—	—	—	—

Table 9.—Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2:					
Lovewell, stratified substratum	Severe: flooding	Moderate: wetness	Moderate: flooding wetness	Moderate: wetness	Moderate: flooding wetness
5:					
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Udifluvents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
6:					
Redwater	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness
15B:					
Waddington	Severe: small stones	Severe: small stones	Severe: slope small stones	Slight	Severe: small stones droughty
18A:					
Adams	Moderate: too sandy	Moderate: too sandy	Moderate: too sandy	Moderate: too sandy	Severe: droughty
18B:					
Adams	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Severe: droughty
20A:					
Croghan	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Severe: droughty
33:					
Wainola	Severe: wetness	Moderate: too sandy wetness	Severe: wetness	Moderate: too sandy wetness	Moderate: wetness droughty
39A:					
Churchville	Severe: percs slowly wetness	Moderate: percs slowly wetness	Severe: percs slowly wetness	Moderate: wetness	Moderate: wetness
39B:					
Churchville	Severe: percs slowly wetness	Moderate: percs slowly wetness	Severe: percs slowly wetness	Moderate: wetness	Moderate: wetness

Table 9.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
40B:					
Heuvelton	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Moderate: wetness	Moderate: wetness
40C:					
Heuvelton	Moderate: percs slowly slope wetness	Moderate: percs slowly slope wetness	Severe: slope	Severe: erodes easily	Moderate: slope wetness
41A:					
Muskellunge	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
41B:					
Muskellunge	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
42:					
Adjidaumo	Severe: percs slowly too clayey wetness	Severe: percs slowly too clayey wetness	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness
43:					
Adjidaumo, mucky silty clay	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
44:					
Mino	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
45:					
Sciota	Severe: too sandy wetness	Severe: too sandy	Severe: too sandy wetness	Severe: too sandy	Moderate: wetness droughty
46:					
Deinache	Severe: too sandy wetness	Severe: too sandy wetness	Severe: too sandy wetness	Severe: too sandy wetness	Severe: wetness
47B:					
Elmwood	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: wetness	Moderate: wetness
48:					
Swanton	Severe: percs slowly wetness	Severe: percs slowly	Severe: percs slowly wetness	Moderate: wetness	Moderate: wetness
49:					
Munuscong	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
50:					
Hailesboro	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness

Table 9.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
51:					
Wegatchie	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
53B:					
Nicholville	Moderate: wetness	Moderate: wetness	Moderate: slope wetness	Moderate: wetness	Moderate: wetness
60C:					
Grenville	Moderate: percs slowly slope	Moderate: percs slowly slope	Severe: slope	Slight	Moderate: slope
61B:					
Hogansburg	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: slope small stones wetness	Moderate: wetness	Moderate: wetness
62A:					
Malone	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: small stones wetness
62B:					
Malone	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: small stones wetness
64:					
Runeberg	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
66:					
Matoon	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
68B:					
Fahey	Moderate: small stones wetness	Moderate: small stones wetness	Severe: small stones	Moderate: wetness	Severe: droughty
69A:					
Coveytown	Severe: wetness	Moderate: percs slowly too sandy wetness	Severe: wetness	Moderate: too sandy wetness	Moderate: wetness droughty
70:					
Guff	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
94B:					
Neckrock	Moderate: percs slowly	Moderate: percs slowly	Moderate: slope small stones depth to rock	Slight	Moderate: slope depth to rock
Summerville	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Severe: depth to rock

Table 9.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
94C:					
Neckrock	Moderate: percs slowly slope	Moderate: percs slowly slope	Severe: slope	Slight	Moderate: slope depth to rock
Summerville	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Slight	Severe: depth to rock
101:					
Wonsqueak	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus wetness
104:					
Udorthents, wet substratum	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
105:					
Udorthents, smoothed	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
107:					
Udorthents, Loamy	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
110:					
Borosaprists	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
144:					
Roundabout	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
147A:					
Flackville	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: too sandy wetness	Moderate: wetness droughty
147B:					
Flackville	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: too sandy wetness	Moderate: wetness droughty
148:					
Stockholm	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness
149:					
Pinconning	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
181:					
Dorval	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding

Table 9.—Recreational Development—Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
260C:					
Grenville, very stony--	Moderate: large stones slope	Moderate: large stones slope	Severe: large stones slope small stones	Slight	Moderate: large stones slope
261B:					
Hogansburg, very stony-	Moderate: large stones percs slowly wetness	Moderate: large stones percs slowly wetness	Severe: large stones small stones	Moderate: wetness	Severe: large stones wetness
263B:					
Malone, very stony-----	Severe: wetness	Moderate: large stones percs slowly wetness	Severe: large stones small stones wetness	Moderate: wetness	Moderate: large stones small stones wetness
264:					
Runeberg, very stony---	Severe: wetness	Severe: wetness	Severe: large stones wetness	Severe: wetness	Severe: wetness
270B:					
Coveytown, very stony--	Severe: wetness	Moderate: large stones percs slowly wetness	Severe: large stones too sandy wetness	Moderate: too sandy wetness	Moderate: large stones wetness droughty
W:					
Water------------------	—	—	—	—	--

Table 10.—Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
2:										
Lovewell, stratified substratum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
5:										
Fluvaquents, frequently flooded (poorly drained)	Very poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Poor	Good
Fluvaquents, frequently flooded	Very poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair
Udifluvents, frequently flooded	Very poor	Poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor
6:										
Redwater	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
15B:										
Waddington	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor
18A:										
Adams	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
18B:										
Adams	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
20A:										
Croghan	Poor	Fair	Fair	Poor	Poor	Poor	Poor	Fair	Poor	Poor
33:										
Wainola	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair
39A:										
Churchville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
39B:										
Churchville	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
40B:										
Heuvelton	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
40C:										
Heuvelton	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
41A:										
Muskellunge	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
41B:										
Muskellunge	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor

Table 10.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
42:										
Adjidaumo	Poor	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good
43:										
Adjidaumo, mucky silty clay	Very poor	Poor	Poor	Poor	Poor	Good	Good	Very poor	Poor	Good
44:										
Mino	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
45:										
Sciota	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair
46:										
Deinache	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair
47B:										
Elmwood	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
48:										
Swanton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
49:										
Munuscong	Good	Good	Poor	Poor	Poor	Good	Good	Good	Poor	Good
50:										
Hailesboro	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
51:										
Wegatchie	Poor	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good
53B:										
Nicholville	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
60C:										
Grenville	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
61B:										
Hogansburg	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
62A:										
Malone	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
62B:										
Malone	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
64:										
Runeberg	Very poor	Poor	Fair	Poor	Fair	Good	Good	Poor	Poor	Good
66:										
Matoon	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Poor
68B:										
Fahey	Very poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Poor	Poor	Very poor

Table 10.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
69A:										
Coveytown	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair
70:										
Guff	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
94B:										
Neckrock	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Summerville	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
94C:										
Neckrock	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Good	Very poor
Summerville	Poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
101:										
Wonsqueak	Very poor	Poor	Poor	Poor	Poor	Good	Good	Very poor	Poor	Good
104:										
Udorthents, wet substratum	Very poor	Very poor	Poor	Very poor	Very poor	Poor	Poor	Poor	Very poor	Very poor
105:										
Udorthents, smoothed	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
107:										
Udorthents, Loamy	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
110:										
Borosaprists	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good
Fluvaquents	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good
144:										
Roundabout	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
147A:										
Flackville	Fair	Fair	Good	Good	Good	Poor	Very poor	Fair	Good	Very poor
147B:										
Flackville	Fair	Fair	Good	Good	Good	Poor	Very poor	Fair	Good	Very poor
148:										
Stockholm	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair
149:										
Pinconning	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good

Table 10.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for: Openland wildlife	Woodland wildlife	Wetland wildlife
181:										
Dorval	Very poor	Very poor	Very poor	Poor	Poor	Good	Good	Very poor	Poor	Good
260C:										
Grenville, very stony	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
261B:										
Hogansburg, very stony	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
263B:										
Malone, very stony	Very poor	Poor	Good	Good	Good	Poor	Very poor	Poor	Good	Very poor
264:										
Runeberg, very stony	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good
270B:										
Coveytown, very stony	Very poor	Poor	Fair	Poor	Poor	Poor	Very poor	Poor	Poor	Very poor
W:										
Water	—	—	—	—	—	—	—	—	—	—

Table 11.—Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2:						
Lovewell, stratified substratum	Severe: wetness cutbanks cave	Severe: flooding	Severe: flooding wetness	Severe: flooding	Severe: flooding frost action	Moderate: flooding wetness
5:						
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Udifluvents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
6:						
Redwater	Severe: wetness cutbanks cave	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding frost action wetness	Severe: flooding wetness
15B:						
Waddington	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Moderate: frost action	Severe: small stones droughty
18A:						
Adams	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Severe: droughty
18B:						
Adams	Severe: cutbanks cave	Slight	Slight	Moderate: slope	Slight	Severe: droughty
20A:						
Croghan	Severe: wetness cutbanks cave	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: frost action wetness	Severe: droughty
33:						
Wainola	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: frost action wetness	Moderate: wetness droughty
39A:						
Churchville	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
39B:						
Churchville	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness

Table 11.—Building Site Development—Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
40B:						
Heuvelton	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: frost action low strength	Moderate: wetness
40C:						
Heuvelton	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: wetness	Severe: slope	Severe: frost action low strength	Moderate: slope wetness
41A:						
Muskellunge	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
41B:						
Muskellunge	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
42:						
Adjidaumo	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength wetness	Severe: too clayey wetness
43:						
Adjidaumo, mucky silty clay	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
44:						
Mino	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: wetness
45:						
Sciota	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: frost action wetness	Moderate: wetness droughty
46:						
Deinache	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
47B:						
Elmwood	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: frost action low strength	Moderate: wetness
48:						
Swanton	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: wetness
49:						
Munuscong	Severe: ponding	Severe: ponding	Severe: shrink-swell ponding	Severe: ponding	Severe: frost action ponding	Severe: ponding

Table 11.—Building Site Development—Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
50:						
Hailesboro	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: wetness
51:						
Wegatchie	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength wetness	Severe: wetness
53B:						
Nicholville	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Severe: frost action	Moderate: wetness
60C:						
Grenville	Moderate: slope dense layer	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: slope
61B:						
Hogansburg	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Severe: frost action	Moderate: wetness
62A:						
Malone	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: small stones wetness
62B:						
Malone	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: small stones wetness
64:						
Runeberg	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action wetness	Severe: wetness
66:						
Matoon	Severe: wetness depth to rock	Severe: wetness	Severe: wetness depth to rock	Severe: wetness	Severe: frost action low strength wetness	Severe: wetness
68B:						
Fahey	Severe: wetness cutbanks cave	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Moderate: wetness	Severe: droughty
69A:						
Coveytown	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: frost action wetness	Moderate: wetness droughty
70:						
Guff	Severe: ponding depth to rock	Severe: ponding	Severe: ponding depth to rock	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding

Table 11.—Building Site Development—Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
94B:						
Neckrock	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: slope	Moderate: depth to rock	Moderate: slope depth to rock
Summerville	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock
94C:						
Neckrock	Severe: depth to rock	Moderate: slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: slope depth to rock	Moderate: slope depth to rock
Summerville	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock
101:						
Wonsqueak	Severe: excess humus wetness	Severe: low strength wetness	Severe: wetness	Severe: low strength wetness	Severe: frost action wetness	Severe: excess humus wetness
104:						
Udorthents, wet substratum	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
105:						
Udorthents, smoothed	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
107:						
Udorthents, Loamy	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
110:						
Borosaprists	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
144:						
Roundabout	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: wetness
147A:						
Flackville	Severe: wetness cutbanks cave	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: frost action shrink-swell wetness	Moderate: wetness droughty
147B:						
Flackville	Severe: wetness cutbanks cave	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Moderate: frost action shrink-swell wetness	Moderate: wetness droughty
148:						
Stockholm	Severe: wetness cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength wetness	Severe: wetness

Table 11.—Building Site Development—Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
149:						
Pinconning	Severe: ponding cutbanks cave	Severe: ponding	Severe: shrink-swell ponding	Severe: ponding	Severe: shrink-swell ponding	Severe: ponding
181:						
Dorval	Severe: excess humus ponding	Severe: low strength subsides ponding	Severe: shrink-swell subsides ponding	Severe: low strength subsides ponding	Severe: frost action subsides ponding	Severe: excess humus ponding
260C:						
Grenville, very stony	Moderate: slope dense layer	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: large stones slope
261B:						
Hogansburg, very stony	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Severe: frost action	Severe: large stones wetness
263B:						
Malone, very stony	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: large stones small stones wetness
264:						
Runeberg, very stony	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action wetness	Severe: wetness
270B:						
Coveytown, very stony	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: frost action wetness	Moderate: large stones wetness droughty
W:						
Water	—	—	—	—	—	—

Table 12.—Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2:					
Lovewell, stratified substratum	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding wetness	Fair: thin layer wetness
5:					
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Udifluvents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
6:					
Redwater	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage depth to rock	Severe: flooding seepage wetness	Poor: thin layer wetness
15B:					
Waddington	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage small stones too sandy
18A:					
Adams	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
18B:					
Adams	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Severe: seepage	Poor: seepage too sandy
20A:					
Croghan	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: seepage too sandy
33:					
Wainola	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: too sandy wetness
39A:					
Churchville	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness

Table 12.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
39B:					
Churchville	Severe: percs slowly wetness	Moderate: slope	Severe: wetness	Severe: wetness	Poor: wetness
40B:					
Heuvelton	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Moderate: wetness	Poor: too clayey
40C:					
Heuvelton	Severe: percs slowly wetness	Severe: slope	Severe: too clayey wetness	Moderate: slope wetness	Poor: too clayey
41A:					
Muskellunge	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
41B:					
Muskellunge	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
42:					
Adjidaumo	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
43:					
Adjidaumo, mucky silty clay	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
44:					
Mino	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
45:					
Sciota	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: too sandy wetness
46:					
Deinache	Severe: wetness poor filter	Severe: seepage wetness	Severe: seepage too sandy wetness	Severe: seepage wetness	Poor: too sandy wetness
47B:					
Elmwood	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey wetness	Severe: seepage	Poor: hard to pack too clayey

Table 12.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
48:					
Swanton	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey wetness	Severe: seepage wetness	Poor: hard to pack too clayey wetness
49:					
Munuscong	Severe: percs slowly ponding	Severe: seepage ponding	Severe: too clayey ponding	Severe: seepage ponding	Poor: hard to pack too clayey ponding
50:					
Hailesboro	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
51:					
Wegatchie	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
53B:					
Nicholville	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: wetness	Fair: wetness
60C:					
Grenville	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: small stones
61B:					
Hogansburg	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Moderate: wetness	Fair: small stones
62A:					
Malone	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
62B:					
Malone	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
64:					
Runeberg	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
66:					
Matoon	Severe: percs slowly wetness depth to rock	Severe: wetness depth to rock	Severe: too clayey wetness depth to rock	Severe: wetness depth to rock	Poor: hard to pack too clayey depth to rock
68B:					
Fahey	Severe: wetness poor filter	Severe: seepage wetness	Severe: too sandy wetness	Severe: seepage wetness	Poor: seepage small stones too sandy

Table 12.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
69A:					
Coveytown	Severe: percs slowly wetness	Severe: seepage wetness	Severe: wetness	Severe: seepage wetness	Poor: small stones wetness
70:					
Guff	Severe: percs slowly ponding depth to rock	Severe: ponding depth to rock	Severe: too clayey ponding depth to rock	Severe: ponding depth to rock	Poor: hard to pack too clayey depth to rock
94B:					
Neckrock	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
Summerville	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
94C:					
Neckrock	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
Summerville	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
101:					
Wonsqueak	Severe: percs slowly ponding	Severe: excess humus seepage wetness	Severe: wetness	Severe: seepage wetness	Poor: wetness
104:					
Udorthents, wet substratum	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
105:					
Udorthents, smoothed	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
107:					
Udorthents, Loamy	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
110:					
Borosaprists	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
144:					
Roundabout	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
147A:					
Flackville	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey wetness	Severe: seepage	Poor: too clayey

Table 12.—Sanitary Facilities—Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
147B:					
Flackville	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey wetness	Severe: seepage	Poor: too clayey
148:					
Stockholm	Severe: percs slowly wetness	Severe: seepage	Severe: too clayey wetness	Severe: seepage wetness	Poor: too clayey wetness
149:					
Pinconning	Severe: percs slowly ponding	Severe: seepage ponding	Severe: too clayey ponding	Severe: seepage ponding	Poor: hard to pack too clayey ponding
181:					
Dorval	Severe: percs slowly subsides ponding	Severe: excess humus seepage ponding	Severe: too clayey ponding	Severe: seepage ponding	Poor: hard to pack too clayey ponding
260C:					
Grenville, very stony	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope small stones
261B:					
Hogansburg, very stony	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Moderate: wetness	Fair: small stones
263B:					
Malone, very stony	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
264:					
Runeberg, very stony	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
270B:					
Coveytown, very stony	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
W:					
Water	—	—	—	—	—

Table 13.—Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
2:				
Lovewell, stratified substratum	Fair: wetness	Probable	Improbable: too sandy	Fair: area reclaim
5:				
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Udifluvents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
6:				
Redwater	Poor: wetness	Probable	Probable	Poor: area reclaim small stones wetness
15B:				
Waddington	Good	Probable	Probable	Poor: area reclaim small stones
18A:				
Adams	Good	Probable	Improbable: too sandy	Poor: too sandy
18B:				
Adams	Good	Probable	Improbable: too sandy	Poor: too sandy
20A:				
Croghan	Fair: wetness	Probable	Improbable: too sandy	Poor: too sandy
33:				
Wainola	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: too sandy
39A:				
Churchville	Fair: thin layer wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
39B:				
Churchville	Fair: thin layer wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
40B:				
Heuvelton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
40C:				
Heuvelton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 13.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
41A: Muskellunge	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer too clayey
41B: Muskellunge	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: thin layer wetness
42: Adjidaumo	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
43: Adjidaumo, mucky silty clay	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
44: Mino	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
45: Sciota	Fair: wetness	Probable	Improbable: too sandy	Poor: too sandy
46: Deinache	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: too sandy wetness
47B: Elmwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
48: Swanton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
49: Munuscong	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
50: Hailesboro	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
51: Wegatchie	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
53B: Nicholville	Poor: frost action	Improbable: excess fines	Improbable: excess fines	Good
60C: Grenville	Good	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones

Table 13.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
61B:				
Hogansburg	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
62A:				
Malone	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
62B:				
Malone	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
64:				
Runeberg	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: small stones wetness
66:				
Matoon	Poor: low strength wetness depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
68B:				
Fahey	Fair: wetness	Improbable: thin layer	Improbable: thin layer	Poor: area reclaim small stones
69A:				
Coveytown	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones too sandy
70:				
Guff	Poor: low strength wetness depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
94B:				
Neckrock	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: small stones
Summerville	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
94C:				
Neckrock	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: small stones
Summerville	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
101:				
Wonsqueak	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess humus wetness

Table 13.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
104:				
Udorthents, wet substratum	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
105:				
Udorthents, smoothed	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
107:				
Udorthents, Loamy	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
110:				
Borosaprists	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
144:				
Roundabout	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
147A:				
Flackville	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too sandy
147B:				
Flackville	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too sandy
148:				
Stockholm	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
149:				
Pinconning	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too sandy wetness
181:				
Dorval	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess humus wetness
260C:				
Grenville, very stony	Good	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
261B:				
Hogansburg, very stony	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
263B:				
Malone, very stony	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones

Table 13.—Construction Materials—Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
264:				
Runeberg, very stony----	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: small stones wetness
270B:				
Coveytown, very stony---	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Poor: large stones too sandy
W:				
Water-------------------	---	---	---	---

Table 14.—Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2:							
Lovewell, stratified substratum	Severe: seepage	Severe: piping wetness	Severe: cutbanks cave	Limitation: flooding frost action	Limitation: flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily
5:							
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Udifluvents, frequently flooded	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
6:							
Redwater	Severe: seepage	Severe: piping wetness	Severe: cutbanks cave	Limitation: flooding frost action	Limitation: flooding wetness	Limitation: wetness	Limitation: wetness
15B:							
Waddington	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: large stones too sandy	Limitation: large stones droughty
18A:							
Adams	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
18B:							
Adams	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
20A: Croghan	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: droughty
33: Wainola	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
39A: Churchville	Slight	Severe: piping wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
39B: Churchville	Moderate: slope	Severe: piping wetness	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
40B: Heuvelton	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
40C: Heuvelton	Severe: slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily percs slowly slope
41A: Muskellunge	Slight	Moderate: hard to pack wetness	Severe: slow refill cutbanks cave	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
41B: Muskellunge	Moderate: slope	Moderate: hard to pack wetness	Severe: slow refill cutbanks cave	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
42: Adjidaumo	Slight	Severe: wetness	Severe: slow refill	Limitation: frost action percs slowly	Limitation: percs slowly slow intake wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
43: Adjidaumo, mucky silty clay	Slight	Severe: ponding	Severe: slow refill	Limitation: frost action percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
44: Mino	Moderate: seepage	Severe: piping wetness	Moderate: slow refill	Limitation: frost action	Limitation: wetness	Limitation: wetness	Limitation: wetness
45: Sciota	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
46: Deinache	Severe: seepage	Severe: seepage piping wetness	Severe: cutbanks cave	Limitation: cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
47B: Elmwood	Severe: seepage	Moderate: hard to pack piping wetness	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness soil blowing	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
48: Swanton	Severe: seepage	Severe: wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly wetness
49: Munuscong	Severe: seepage	Severe: hard to pack ponding	Severe: slow refill	Limitation: frost action percs slowly ponding	Limitation: percs slowly soil blowing ponding	Limitation: percs slowly soil blowing ponding	Limitation: percs slowly wetness
50: Hailesboro	Slight	Severe: piping wetness	Severe: slow refill	Limitation: frost action	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
51: Wegatchie	Slight	Severe: piping wetness	Severe: slow refill	Limitation: frost action	Limitation: erodes easily wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
53B: Nicholville	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action cutbanks cave	Limitation: erodes easily	Limitation: erodes easily wetness	Limitation: erodes easily
60C: Grenville	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: rooting depth slope droughty	Limitation: slope	Limitation: rooting depth slope droughty
61B: Hogansburg	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action slope	Limitation: rooting depth slope wetness	Limitation: wetness	Limitation: rooting depth
62A: Malone	Slight	Severe: piping	Severe: no water	Limitation: frost action percs slowly	Limitation: wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
62B:							
Malone	Moderate: slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
64:							
Runeberg	Slight	Severe: piping wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: percs slowly wetness	Limitation: percs slowly rooting depth wetness
66:							
Matoon	Moderate: depth to rock	Severe: thin layer wetness	Severe: no water	Limitation: frost action depth to rock	Limitation: wetness depth to rock	Limitation: erodes easily wetness depth to rock	Limitation: erodes easily wetness depth to rock
68B:							
Fahey	Severe: seepage	Severe: seepage wetness	Severe: slow refill cutbanks cave	Limitation: large stones slope cutbanks cave	Limitation: large stones slope wetness	Limitation: large stones too sandy wetness	Limitation: large stones droughty
69A:							
Coveytown	Severe: seepage	Severe: piping wetness	Severe: slow refill cutbanks cave	Limitation: cutbanks cave	Limitation: fast intake wetness droughty	Limitation: wetness soil blowing	Limitation: wetness droughty
70:							
Guff	Moderate: depth to rock	Severe: ponding	Severe: slow refill depth to rock	Limitation: percs slowly ponding depth to rock	Limitation: percs slowly ponding	Limitation: erodes easily ponding depth to rock	Limitation: erodes easily wetness depth to rock
94B:							
Neckrock	Moderate: seepage slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock
Summerville	Severe: depth to rock	Severe: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
94C:							
Neckrock	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: slope depth to rock	Limitation: slope depth to rock
Summerville	Severe: slope depth to rock	Severe: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
101:							
Wonsqueak	Severe: seepage	Severe: piping wetness	Severe: slow refill	Limitation: frost action subsides	Limitation: wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
104:							
Udorthents, wet substratum	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
105:							
Udorthents, smoothed	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
107:							
Udorthents, Loamy	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
110:							
Borosaprists	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Fluvaquents	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
144:							
Roundabout	Moderate: seepage	Severe: piping wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
147A:							
Flackville	Severe: seepage	Severe: piping	Severe: no water	Limitation: percs slowly	Limitation: wetness droughty	Limitation: wetness soil blowing	Limitation: percs slowly droughty
147B:							
Flackville	Severe: seepage	Severe: piping	Severe: no water	Limitation: percs slowly slope	Limitation: slope wetness droughty	Limitation: percs slowly wetness soil blowing	Limitation: percs slowly droughty
148:							
Stockholm	Severe: seepage	Severe: piping wetness	Severe: slow refill cutbanks cave	Limitation: percs slowly	Limitation: fast intake wetness droughty	Limitation: percs slowly wetness	Limitation: wetness droughty
149:							
Pinconning	Severe: seepage	Severe: seepage ponding	Severe: slow refill cutbanks cave	Limitation: percs slowly ponding cutbanks cave	Limitation: fast intake ponding droughty	Limitation: percs slowly soil blowing ponding	Limitation: percs slowly wetness droughty
181:							
Dorval	Severe: seepage	Severe: ponding	Severe: no water	Limitation: percs slowly subsides ponding	Limitation: percs slowly soil blowing ponding	Limitation: percs slowly soil blowing ponding	Limitation: percs slowly wetness
260C:							
Grenville, very stony	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: rooting depth slope droughty	Limitation: slope	Limitation: rooting depth slope droughty
261B:							
Hogansburg, very stony	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action slope	Limitation: rooting depth slope wetness	Limitation: wetness	Limitation: rooting depth

Table 14.—Water Management—Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
263B:							
Malone, very stony-----	Moderate: slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
264:							
Runeberg, very stony---	Slight	Severe: piping wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly rooting depth wetness	Limitation: percs slowly wetness	Limitation: percs slowly rooting depth wetness
270B:							
Coveytown, very stony--	Severe: seepage	Severe: seepage wetness	Severe: slow refill cutbanks cave	Limitation: slope cutbanks cave	Limitation: slope wetness	Limitation: too sandy wetness	Limitation: wetness droughty
W:							
Water------------------	---	---	---	---	---	---	---

Table 15.—Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
2:												
Lovewell, stratified substratum-----	0-11	Very fine sandy loam	ML, CL-ML, CL	A-6, A-4	0	0	95-100	95-100	90-100	50-80	0-40	NP-15
	11-30	Very fine sandy loam, silt loam	CL, ML, CL-ML	A-6, A-4	0	0	95-100	95-100	90-100	50-70	0-40	NP-15
	30-50	Very fine sandy loam, silt loam, loamy very fine sand	CL-ML, CL, ML	A-4, A-6	0	0	95-100	95-100	90-100	45-65	0-40	NP-15
	50-75	Stratified fine sand	ML, SM, SP-SM	A-3, A-2, A-4	0	0	85-100	80-100	50-95	5-55	0-14	NP
5:												
Fluvaquents, frequently flooded--------	0-12	Mucky silt loam	ML, CL, SM	A-2, A-4, A-6	0	0-5	80-100	75-100	40-100	15-95	0-30	NP-20
	12-72	Very gravelly sandy loam, gravelly silt loam, silty clay loam	ML, SC-SM, GM, CL	A-2, A-6	0	0-15	55-100	40-100	15-100	5-90	0-30	NP-20
Fluvaquents, frequently flooded--------	0-12	Silt loam	SM, ML, CL	A-2, A-4, A-6	0	0-5	86-100	86-100	40-100	15-95	0-30	NP-20
	12-72	Very gravelly sandy loam, gravelly silt loam, silty clay loam	CL, ML, SC-SM, GM	A-6, A-2	0	0-15	55-100	40-100	15-100	5-90	0-30	NP-20

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Udifluvents, frequently flooded	0-12	Gravelly loamy sand	CL, GM, ML, SM	A-1, A-4, A-2	0	0-10	60-80	55-75	30-75	10-65	0-25	NP-20
	12-72	Very gravelly sand, gravelly loam, silty clay loam, silt loam	GM, ML, CL	A-6, A-1, A-2, A-4	0	0-15	50-100	35-100	15-100	5-90	0-30	NP-20
6: Redwater	0-7	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-2, A-4, A-6	0	0	80-100	75-100	50-100	25-80	15-35	NP-15
	7-38	Fine sandy loam, loam, silt loam	SM, CL-ML, ML, SC-SM	A-6, A-4, A-2-4, A-2	0	0	80-100	75-100	50-95	30-75	15-35	NP-15
	38-50	Fine sandy loam, stratified gravelly sandy loam to sand, loamy fine sand, loamy sand	GM, GW, SM, SW	A-3, A-2, A-1, A-2-4	0	0-20	50-100	35-100	20-85	0-50	0-14	NP
	50-60	Unweathered bedrock			—	—	—	—	—	—	—	—
15B: Waddington	0-9	Gravelly loam	CL-ML, GM, SC-SM, SM	A-4, A-2-4, A-1	—	0-25	50-90	45-80	45-80	15-65	17-30	NP-10
	9-26	Gravelly fine sandy loam, very gravelly loam	CL, CL-ML, SM, SP-SM	A-1, A-2-4, A-4	—	0-25	50-90	40-80	25-80	10-60	10-30	NP-10
	26-31	Very gravelly loamy sand, very gravelly sand, very gravelly sandy loam	GM, GP-GM, GW-GM, SM	A-1, A-2-4	—	0-25	50-85	40-85	20-50	5-30	0-10	NP-4

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
	31-72	Stratified extremely gravelly coarse sand, very gravelly loamy sand, very gravelly sandy loam	GP, GW-GM	A-1	—	4-30	40-75	25-45	10-25	0-10	0-10	NP-4
18A:												
Adams-----------	0-7	Loamy sand	SM, SP-SM	A-2, A-1, A-4, A-3	0	0	95-100	90-100	45-85	5-40	0-14	NP
	7-9	Sand, loamy fine sand	SM, SP-SM	A-4, A-2	0	0	95-100	90-100	45-85	5-40	15-20	NP-4
	9-27	Loamy sand, sand, loamy fine sand	SM, SP-SM	A-2, A-4, A-3, A-1	0	0	95-100	90-100	45-85	5-40	0-14	NP
	27-72	Fine sand, sand, coarse sand, gravelly sand	SM, SP-SM, SW-SM	A-1, A-3, A-2	0	0-1	80-100	70-100	40-80	5-30	0-14	NP
18B:												
Adams-----------	0-7	Loamy sand	SM, SP-SM	A-1, A-2, A-4, A-3	0	0	95-100	90-100	45-85	5-40	0-14	NP
	7-9	Sand, loamy fine sand	SP-SM, SW-SM, SM	A-2, A-4	0	0	95-100	90-100	45-85	5-40	15-20	NP-4
	9-27	Loamy sand, sand, loamy fine sand	SP-SM, SM	A-2, A-1, A-3, A-4	0	0	95-100	90-100	45-85	5-40	0-14	NP
	27-72	Fine sand, sand, coarse sand, gravelly sand	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	0-1	80-100	70-100	40-80	5-30	0-14	NP

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
20A:												
Croghan----------	0-1	Moderately decomposed plant material	PT	A-8	0	0	—	—	—	—	—	---
	1-3	Loamy fine sand	SM, SW-SM, SP-SM	A-4, A-3, A-2, A-1	0	0	95-100	95-100	45-80	5-40	0-14	NP
	3-9	Fine sand	SP-SM, SM, SW-SM	A-2, A-4, A-1, A-3	0	0	95-100	95-100	45-80	5-40	0-14	NP
	9-33	Fine sand, sand, loamy sand	SM, SW-SM, SP-SM	A-4, A-1, A-2, A-3	0	0	85-100	80-100	45-80	5-40	0-14	NP
	33-72	Fine sand, loamy sand, coarse sand	SM, SP-SM, SW-SM	A-1, A-2, A-3	0	0	85-100	80-100	45-80	5-35	0-14	NP
33:												
Wainola----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	—	—	—	—	—	---
	1-7	Loamy fine sand, fine sand	SM	A-2-4	0	0	100	90-100	50-80	15-50	0-14	NP
	7-22	Fine sand, loamy fine sand, very fine sand	SM, ML	A-2-4, A-4	0	0	100	90-100	50-80	15-50	0-14	NP
	22-34	Fine sand, loamy fine sand, very fine sand	ML, SM	A-4, A-2-4	0	0	100	90-100	50-80	15-50	0-14	NP
	34-72	Fine sand, loamy fine sand, very fine sand	SM	A-2-4	0	0	100	90-100	50-80	15-35	0-14	NP

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
39A:												
Churchville-----	0-11	Silty clay loam	CL, MH, ML	A-7	0	0	92-100	85-100	65-100	45-95	40-55	15-25
	11-22	Silty clay loam, silty clay, clay loam	CL	A-7	0	0	92-100	85-100	80-100	65-95	40-50	25-35
	22-72	Cobbly loam, gravelly loam, gravelly fine sandy loam, gravelly very fine sandy loam, silty clay loam	GC, CL, GM, ML	A-4, A-2	0-7	0-20	60-92	50-85	35-80	25-70	10-20	1-8
39B:												
Churchville-----	0-11	Silty clay loam	MH, ML, CL	A-7	0	0	92-100	85-100	65-100	45-95	40-55	15-25
	11-22	Silty clay loam, silty clay, clay loam	CL	A-7	0	0	92-100	85-100	80-100	65-95	40-50	25-35
	22-72	Cobbly loam, gravelly loam, gravelly fine sandy loam, gravelly very fine sandy loam, silty clay loam	CL, GC, GM, ML	A-2, A-4	0-7	0-20	60-92	50-85	35-80	25-70	10-20	1-8
40B:												
Heuvelton-------	0-6	Silty clay loam	CL, CL-ML	A-4, A-6	0	0-1	90-100	80-100	80-100	70-95	25-40	5-20
	6-10	Silty clay loam, silty clay	CH, CL	A-7, A-6	0	0	95-100	85-100	80-100	75-95	30-55	10-30
	10-39	Silty clay, clay, silty clay loam	CL	A-7, A-6	0	0	95-100	85-100	80-100	75-95	30-55	10-30
	39-72	Clay, silty clay, silty clay loam	CL	A-7, A-6	0	0	95-100	85-100	80-100	75-100	25-50	10-30

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number— 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
40C:												
Heuvelton-------	0-6	Silty clay loam	CL-ML, CL	A-6, A-4	0	0-1	90-100	80-100	80-100	70-95	25-40	5-20
	6-10	Silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	85-100	80-100	75-95	30-55	10-30
	10-39	Silty clay, clay, silty clay loam	CL	A-6, A-7	0	0	95-100	85-100	80-100	75-95	30-55	10-30
	39-72	Clay, silty clay, silty clay loam	CL	A-7, A-6	0	0	95-100	85-100	80-100	75-100	25-50	10-30
41A:												
Muskellunge-----	0-9	Silty clay loam	MH, CL, ML, CH	A-7, A-6	0	0	92-100	90-100	90-100	70-95	30-55	10-25
	9-38	Silty clay, silty clay loam	CL, CH	A-7, A-6	0	0	95-100	92-100	90-100	70-95	30-55	15-30
	38-72	Silty clay, clay	CL, CH	A-7, A-6	0	0	92-100	85-100	75-100	50-95	30-55	15-30
41B:												
Muskellunge-----	0-9	Silty clay loam	ML, MH, CL, CH	A-6, A-7	0	0	92-100	90-100	90-100	70-95	30-55	10-25
	9-38	Silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	95-100	92-100	90-100	70-95	30-55	15-30
	38-72	Silty clay, clay	CL, CH	A-6, A-7	0	0	92-100	85-100	75-100	50-95	30-55	15-30
42:												
Adjidaumo-------	0-7	Silty clay	MH, ML	A-6, A-7	0	0	95-100	95-100	85-100	65-100	35-65	10-25
	7-36	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	70-100	38-65	20-35
	36-72	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	0	0	95-100	95-100	65-100	60-100	35-60	15-35

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
43:												
Adjidaumo, mucky silty clay-----	0-7	Mucky silty clay	CH, CL	A-6, A-7-6	0	0	95-100	95-100	90-100	85-95	35-65	15-35
	7-36	Silty clay, clay, silty clay loam	CL, CH	A-7, A-6	0	0	95-100	95-100	85-100	70-100	38-65	20-35
	36-72	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	—	0	95-100	95-100	65-100	60-100	35-60	15-35
44:												
Mino------------	0-9	Loam	ML, SM	A-4	0	0	95-100	92-100	70-100	35-90	0-20	NP-4
	9-24	Very fine sandy loam, loamy very fine sand, loam, fine sandy loam	ML, SM	A-4	0	0	95-100	92-100	70-95	35-90	0-20	NP-4
	24-78	Very fine sandy loam, loam, fine sandy loam	SM, ML	A-4	0	0	95-100	92-100	70-95	35-90	0-20	NP-4
45:												
Sciota----------	0-9	Fine sand	SM	A-2-4	0	0	100	100	65-80	20-35	0-14	NP
	9-37	Fine sand, loamy fine sand	SM	A-2-4	0	0	100	95-100	60-80	15-35	0-14	NP
	37-72	Loamy fine sand, fine sand, sand	SM, SP-SM	A-3, A-2-4	0	0	100	95-100	50-80	5-35	0-14	NP

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number— 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
46:												
Deinache	0-9	Fine sand	SM	A-2-4	0	0	100	98-100	60-85	15-45	0-14	NP
	9-44	Fine sand, loamy fine sand	SM	A-4, A-2-4	0	0	100	98-100	60-80	15-40	0-14	NP
	44-72	Loamy very fine sand, very fine sandy loam, silt loam, fine sand	SM, ML	A-2-4, A-4	0	0	100	95-100	85-100	30-90	0-25	NP-4
47B:												
Elmwood	0-6	Fine sandy loam	ML, SM	A-4, A-2	0	0	100	95-100	65-90	30-65	0-30	NP-7
	6-25	Fine sandy loam, sandy loam, loam	ML, CL, SC, SM	A-4, A-2	0	0	100	95-100	65-90	30-65	0-30	NP-9
	25-72	Silty clay, silty clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0	100	100	90-100	80-95	35-55	11-30
48:												
Swanton	0-9	Very fine sandy loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	60-95	30-65	0-30	NP-9
	9-31	Fine sandy loam, sandy loam	CL, ML, SC, SM	A-4, A-2	0	0	100	95-100	60-95	30-65	0-30	NP-9
	31-72	Silty clay, clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	99-100	95-100	90-100	25-55	11-30
49:												
Munuscong	0-8	Mucky fine sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	100	92-100	60-85	30-55	0-25	2-8
	8-26	Fine sandy loam, sandy loam	SC, SC-SM, SM	A-4, A-2	0	0	100	92-100	60-85	30-55	0-30	2-10
	26-98	Silty clay, silty clay loam, clay	MH, CL, CH, ML	A-7	0	0	100	95-100	90-100	80-95	40-80	20-40

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
50:												
Hailesboro------	0-9	Silt loam	CL-ML, ML, CL	A-6, A-4	0	0	100	92-100	85-100	60-90	20-40	3-15
	9-30	Silt loam, silty clay loam, very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	95-100	92-100	85-100	60-95	25-35	3-13
	30-72	Silt loam, silty clay loam, very fine sandy loam	CL-ML, CL, ML	A-6, A-4	0	0	95-100	92-100	90-100	70-95	25-35	3-13
51:												
Wegatchie-------	0-8	Silt loam	ML, MH	A-7, A-5, A-4	0	0	96-100	96-100	85-100	55-90	35-55	5-15
	8-40	Silty clay loam, clay loam, silt loam, very fine sandy loam	CL-ML, CL	A-4, A-6	0	0	96-100	96-100	80-100	50-95	20-40	5-15
	40-72	Silt loam, silty clay loam, very fine sandy loam	CL, CL-ML	A-6, A-4	0	0	85-100	85-100	70-100	50-95	20-35	5-12
53B:												
Nicholville-----	0-9	Very fine sandy loam	CL-ML, ML	A-6, A-4	0	0	90-100	85-100	70-100	60-90	20-40	2-12
	9-20	Very fine sandy loam, silt loam, loamy very fine sand	ML, CL-ML	A-4	0	0	90-100	85-100	75-100	60-90	15-25	NP-5
	20-34	Loamy very fine sand, loamy fine sand, silt loam, very fine sand	SM, SC-SM, ML, CL-ML	A-4, A-2	0	0	90-100	85-100	65-100	30-90	15-25	NP-5

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
	34-72	Loamy very fine sand, silt loam, loamy fine sand	ML, SC-SM, SM, CL-ML	A-4, A-2	0	0	90-100	85-100	50-100	25-90	15-25	NP-5
60C:												
Grenville-------	0-9	Loam	ML, SM	A-4, A-2	0	0-15	90-100	80-98	50-90	30-80	35-40	1-5
	9-17	Loam, gravelly fine sandy loam, fine sandy loam	ML, CL-ML, SM	A-4, A-2	0-1	0-15	85-95	70-90	35-80	25-65	15-20	1-5
	17-35	Gravelly fine sandy loam, fine sandy loam, loam	CL-ML, GM, ML, SM	A-2, A-4	0-4	0-15	70-95	65-90	35-80	25-65	15-20	1-5
	35-72	Gravelly fine sandy loam, gravelly loam, very gravelly fine sandy loam	SM, ML, GM, GC-GM	A-1, A-2, A-4	0-5	1-15	70-90	50-85	30-70	20-55	15-20	1-5
61B:												
Hogansburg------	0-10	Loam	ML, SM	A-2, A-4	0-1	0-10	85-98	70-95	50-95	30-85	35-40	1-5
	10-19	Loam, fine sandy loam, gravelly loam	CL-ML, GM, ML, SM	A-4, A-2, A-1	0-2	0-10	70-95	65-90	30-90	15-80	15-20	1-5
	19-35	Gravelly loam, fine sandy loam, loam	ML, GM, CL-ML, SM	A-2, A-4, A-1	0-7	1-15	70-92	55-90	30-90	15-80	15-20	1-5
	35-72	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam	SM, ML, GM, CL-ML	A-4, A-2, A-1	0-7	1-15	70-92	60-85	30-70	20-55	15-20	1-5

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
62A:												
Malone----------	0-9	Gravelly loam	SC, GC, CL	A-7, A-6, A-2	0-1	0-15	75-95	60-90	40-65	30-60	35-45	12-20
	9-30	Gravelly fine sandy loam, gravelly sandy loam, loam	GC, CL-ML, SC-SM, SC	A-6, A-4, A-2, A-1	0-1	0-15	65-95	50-90	35-85	15-65	15-25	5-15
	30-72	Very gravelly sandy loam, gravelly fine sandy loam, gravelly loam	SC, GC-GM, GC, CL-ML	A-1, A-4, A-6, A-2	1-5	0-15	65-95	35-90	20-85	10-65	15-25	5-15
62B:												
Malone----------	0-9	Gravelly loam	GC, SC, CL	A-2, A-6, A-7	0-1	0-15	75-95	60-90	40-65	30-60	35-45	12-20
	9-30	Gravelly fine sandy loam, gravelly sandy loam, loam	SC-SM, CL-ML, GC, SC	A-1, A-2, A-4, A-6	0-1	0-15	65-95	50-90	35-85	15-65	15-25	5-15
	30-72	Very gravelly sandy loam, gravelly fine sandy loam, gravelly loam	GC-GM, SC, GC, CL-ML	A-2, A-4, A-6, A-1	1-10	0-15	40-95	35-90	20-85	10-65	15-25	5-15
64:												
Runeberg--------	0-9	Mucky loam	CL-ML, ML	A-4	0-1	0-15	90-100	80-95	65-90	50-80	0-25	NP-5
	9-22	Cobbly loam, sandy loam, gravelly fine sandy loam	ML, SC, SC-SM, SM	A-4, A-2	0-1	1-15	80-100	75-95	50-80	30-60	15-25	3-10
	22-72	Fine sandy loam, gravelly fine sandy loam, sandy loam, loam	SC, ML, SC-SM, SM	A-2, A-4	0-1	1-15	85-100	75-95	50-80	30-60	15-25	3-10

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
66:												
Matoon----------	0-8	Silty clay loam	OL, ML, MH	A-6, A-7	0	0	96-100	96-100	85-100	65-95	35-65	10-25
	8-12	Silty clay loam, silty clay, silt loam	MH, ML	A-6, A-7	0	0	96-100	96-100	85-100	65-95	35-65	10-25
	12-27	Silty clay, clay, silty clay loam	CL, CH	A-7, A-6	0	0	85-100	70-100	65-100	60-95	35-60	15-30
	27-37	Unweathered bedrock			—	—	—	—	—	—	—	--
68B:												
Fahey-----------	0-9	Gravelly fine sandy loam	SP-SM, SM	A-4, A-2, A-1	0-1	0-25	70-98	50-95	35-80	10-50	0-14	NP
	9-27	Very gravelly loamy fine sand, very gravelly sand, cobbly loamy sand	SP-SM, SP, SM	A-1, A-3, A-2-4	0-1	3-30	55-90	35-80	20-55	3-30	0-14	NP
	27-45	Very gravelly sand, cobbly sand, extremely gravelly loamy sand	SW, GW	A-1	0-1	5-38	40-85	20-60	15-45	0-10	0-14	NP
	45-72	Very gravelly silt loam, cobbly silt loam, very gravelly fine sandy loam	GM, ML, SM, GC-GM	A-4, A-2	1-7	8-30	60-90	40-75	25-70	15-65	15-25	NP-5

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
69A:												
Coveytown-------	0-8	Loamy sand	SP-SM, SM	A-1, A-2, A-3	0	0-10	80-100	75-90	35-70	5-35	0-14	NP
	8-28	Sand, loamy fine sand, gravelly loamy sand	GM, GP, SP, SM	A-2, A-3, A-1	0	0-5	65-100	60-95	25-70	2-35	0-14	NP
	28-72	Gravelly fine sandy loam, gravelly sandy loam, gravelly loam	GM, SM	A-4, A-2	0-7	0-10	65-85	55-85	40-60	25-45	20-25	NP-5
70:												
Guff------------	0-9	Silty clay loam	CL, MH, ML	A-6, A-7	0	0	95-100	95-100	85-100	70-95	35-65	10-35
	9-39	Clay, silty clay, silty clay loam	CH, CL	A-7, A-6	0	0	95-100	95-100	85-100	75-95	38-65	20-35
	39-49	Unweathered bedrock			—	—	—	—	—	—	—	---
94B:												
Neckrock--------	0-9	Loam	SM, ML	A-4	0-1	0-15	85-100	80-95	60-95	40-85	10-30	NP-10
	9-17	Loam, fine sandy loam, gravelly loam	SM, CL-ML, GM, ML	A-2, A-4	0-1	0-15	80-100	70-90	50-85	30-70	15-30	NP-10
	17-27	Cobbly loam, gravelly silt loam, silty clay loam	CL-ML, CL	A-4	0-5	1-9	85-100	70-90	50-85	40-80	25-35	5-15
	27-32	Very gravelly loam, gravelly fine sandy loam, silt loam	SM, ML, GM	A-1-b, A-2, A-4	0-5	1-14	60-90	50-85	30-80	20-70	10-30	1-10
	32-40	Unweathered bedrock			—	—	—	—	—	—	0-14	---

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number— 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Summerville-----	0-5	Loam	CL, CL-ML	A-4, A-6	0	0-15	80-100	70-100	65-95	55-75	25-35	7-15
	5-12	Loam, fine sandy loam, sandy loam	SC, SC-SM, CL-ML, CL	A-4, A-2-6, A-2-4	0-1	0-15	80-100	70-100	55-95	25-75	20-35	4-15
	12-20	Unweathered bedrock			—	—	—	—	—	—	—	--
94C:												
Neckrock--------	0-9	Loam	SM, ML	A-4	0-1	0-15	85-100	80-95	60-95	40-85	10-30	NP-10
	9-17	Loam, fine sandy loam, gravelly loam	SM, ML, GM, CL-ML	A-2, A-4	0-1	0-15	80-100	70-90	50-85	30-70	15-30	NP-10
	17-27	Cobbly loam, gravelly silt loam, silty clay loam	CL-ML, CL	A-4	0-5	1-9	85-100	70-90	50-85	40-80	25-35	5-15
	27-32	Very gravelly loam, gravelly fine sandy loam, silt loam	SM, ML, GM	A-1-b, A-2, A-4	0-5	1-14	60-90	50-85	30-80	20-70	10-30	1-10
	32-40	Unweathered bedrock			—	—	—	—	—	—	0-14	--
Summerville-----	0-5	Loam	CL, CL-ML	A-6, A-4	0	0-15	80-100	70-100	65-95	55-75	25-35	7-15
	5-12	Loam, fine sandy loam, sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-2-4, A-2-6	0-1	0-15	80-100	70-100	55-95	25-75	20-35	4-15
	12-20	Unweathered bedrock			—	—	—	—	—	—	—	--
101:												
Wonsqueak-------	0-7	Muck	PT	A-8	0	0	—	—	—	—	—	--
	7-31	Muck	PT	A-8	0	0	-	—	—	—	—	--
	31-72	Silt loam, fine sandy loam, loam, silty clay loam	SM, ML, CL-ML, CL	A-4, A-2, A-6	0	0-5	85-100	80-100	60-100	30-95	0-40	NP-20

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
104:												
Udorthents, wet substratum-----	0-4	Loam	CL, ML, SC, SM	A-6, A-2, A-4	0	0-5	80-100	75-100	55-100	30-95	0-45	NP-15
	4-72	Very gravelly sandy loam, gravelly fine sandy loam, channery loam, silt loam, silty clay loam	SC, ML, GM, CL	A-2, A-4, A-6, A-1	0	0-10	60-100	50-100	20-100	10-95	0-45	NP-15
105:												
Udorthents, smoothed-------	0-4	Loam	CL, SC, SM, ML	A-6, A-2, A-4	0	0-5	80-100	75-100	55-100	30-95	0-45	NP-15
	4-72	Very gravelly sandy loam, gravelly fine sandy loam, channery loam, silt loam, silty clay loam	ML, CL, GM, SC	A-1, A-2, A-4, A-6	0	0-10	60-100	50-100	20-100	10-95	0-45	NP-15
107:												
Udorthents, Loamy----------	0-4	Loam			0	0-5	80-100	75-100	55-100	30-95	0-45	NP-15
	4-72	Very gravelly sandy loam, gravelly fine sandy loam, channery loam, silt loam, silty clay loam	SC, ML, GM, CL	A-2, A-4, A-6, A-1	0	0-10	60-100	50-100	20-100	10-95	0-45	NP-15

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number—: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
110:												
Borosaprists----	0-7	Mucky peat	PT	A-8	—	—	—	—	—	—	0-14	--
	7-30	Muck	PT	A-8	—	—	—	—	—	—	0-14	--
	30-72	Fine sandy loam, silt loam, sandy loam, gravelly loam, very gravelly loamy sand, sand, silty clay	CL, SM, ML, SC	A-2, A-4, A-6	0-2	0-2	75-100	50-100	45-95	25-95	15-30	NP-12
Fluvaquents-----	0-5	Mucky silt loam	SM, ML, CL	A-2, A-4, A-6	0	0-5	80-100	75-100	40-100	15-95	0-30	NP-20
	5-72	Very gravelly sandy loam, gravelly silt loam, silty clay loam	SC-SM, CL, GM, ML	A-2, A-6	0	0-15	55-100	40-100	15-100	5-90	0-30	NP-20
144:												
Roundabout------	0-9	Silt loam	ML	A-4	0	0	100	90-100	80-100	55-95	0-30	NP-4
	9-31	Very fine sandy loam, silt loam	ML	A-4	0	0	100	90-100	80-100	55-95	0-30	NP-4
	31-72	Silt loam, silty clay loam, very fine sandy loam	ML	A-4	0	0	100	95-100	90-100	70-95	0-35	NP-4
147A:												
Flackville------	0-12	Loamy fine sand	SW-SM, SM	A-2, A-2-4, A-3, A-4	0	0	100	90-100	45-85	5-50	0-20	NP-3
	12-26	Fine sand, sand, loamy fine sand	SW-SM, SM	A-1, A-2, A-3	0	0	100	85-100	45-80	5-35	0-14	NP
	26-72	Silty clay, clay, silty clay loam	CL-ML, CL	A-6, A-7, A-4, A-7-6	0	0	100	90-100	90-100	75-95	20-50	5-30

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number— 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
147B:												
Flackville------	0-12	Loamy fine sand	SW-SM, SM	A-2, A-2-4, A-3, A-4	0	0	100	90-100	45-85	5-50	0-20	NP-3
	12-26	Fine sand, sand, loamy fine sand	SW-SM, SM	A-3, A-2, A-1	0	0	100	85-100	45-80	5-35	0-14	NP
	26-72	Silty clay, clay, silty clay loam	CL-ML, CL	A-7-6, A-7, A-6, A-4	0	0	100	90-100	90-100	75-95	20-50	5-30
148:												
Stockholm-------	0-10	Loamy fine sand	SM, SP-SM	A-2, A-4	0	0	100	92-100	60-85	10-45	0-14	NP
	10-23	Loamy fine sand, fine sand, loamy sand, sand	SM, SP-SM	A-2, A-3, A-4	0	0	100	92-100	55-80	5-40	0-14	NP
	23-30	Clay, clay loam, silty clay, silty clay loam	CL-ML, CL	A-4, A-6, A-7, A-7-6	0	0	100	92-100	85-100	70-95	20-50	5-30
	30-72	Clay, clay loam, silty clay, silty clay loam	CL, CL-ML	A-7-6, A-4, A-6, A-7	0	0	100	92-100	85-100	70-95	20-50	5-30
149:												
Pinconning------	0-9	Mucky loamy fine sand	SM	A-2-4, A-4	0	0	100	99-100	50-75	15-45	0-14	NP
	9-36	Fine sand, loamy fine sand, loamy sand	SP-SM, SM	A-4, A-3, A-2-4	0	0	100	99-100	50-75	5-45	0-14	NP
	36-72	Stratified silty clay to silt loam, silty clay, clay	CL, CH	A-7	0	0	100	99-100	90-100	75-95	40-60	25-35

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
181:												
Dorval----------	0-31	Muck	PT	A-8	0	0	—	—	—	—	0-14	---
	31-72	Silty clay, silty clay loam, clay	CL, CH	A-7	0	0	100	92-100	90-100	75-95	45-70	25-40
260C:												
Grenville, very stony----------	0-9	Loam	ML, SM	A-2, A-4	1-7	0-15	90-100	80-98	50-90	30-80	35-40	1-5
	9-17	Loam, gravelly fine sandy loam, fine sandy loam	SM, ML, CL-ML	A-2, A-4	0-4	0-15	85-95	70-90	35-80	25-65	15-20	1-5
	17-35	Gravelly fine sandy loam, fine sandy loam, loam	CL-ML, GM, SM, ML	A-4, A-2	0-4	0-18	70-95	65-90	35-80	25-65	15-20	1-5
	35-72	Gravelly fine sandy loam, gravelly loam, very gravelly fine sandy loam	ML, SM, GM, GC-GM	A-4, A-2, A-1	0-5	1-20	55-90	50-85	30-70	20-55	15-20	1-5
261B:												
Hogansburg, very stony----------	0-10	Loam	ML, SM	A-2, A-4	1-7	0-10	85-98	70-95	50-95	30-85	35-40	1-5
	10-19	Loam, fine sandy loam, gravelly loam	GM, CL-ML, ML, SM	A-1, A-2, A-4	0-7	0-10	70-95	65-90	30-90	15-80	15-20	1-5
	19-35	Gravelly loam, fine sandy loam, loam	GM, CL-ML, ML, SM	A-1, A-2, A-4	0-7	1-15	70-92	55-90	30-90	15-80	15-20	1-5
	35-72	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam	SM, CL-ML, GM, ML	A-4, A-2, A-1	0-7	1-15	70-92	60-85	30-70	20-55	15-20	1-5

Table 15.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
263B:												
Malone, very stony----------	0-9	Gravelly loam	CL, SC, GC	A-6, A-7, A-2	1-7	0-15	75-95	60-90	40-65	30-60	35-45	12-20
	9-30	Gravelly fine sandy loam, gravelly sandy loam, loam	SC-SM, GC, CL-ML, SC	A-1, A-2, A-4, A-6	0-5	0-15	65-95	50-90	35-85	15-65	15-25	5-15
	30-72	Very gravelly sandy loam, gravelly fine sandy loam, gravelly loam	GC-GM, GC, SC, CL-ML	A-1, A-6, A-4, A-2	1-5	0-15	65-95	35-90	20-85	10-65	15-25	5-15
264:												
Runeberg, very stony----------	0-9	Mucky loam	CL-ML, ML	A-4	1-7	0-15	90-100	80-95	65-90	50-80	0-25	NP-5
	9-22	Cobbly loam, sandy loam, gravelly fine sandy loam	ML, SC, SC-SM, SM	A-2, A-4	0-1	1-15	80-100	75-95	50-80	30-60	15-25	3-10
	22-72	Fine sandy loam, gravelly fine sandy loam, sandy loam, loam	ML, SC, SC-SM, SM	A-2, A-4	0-1	1-15	85-100	75-95	50-80	30-60	15-25	3-10
270B:												
Coveytown, very stony----------	0-8	Loamy sand	SP-SM, SM	A-1, A-2, A-3	1-7	0-10	80-100	75-90	35-70	5-35	0-14	NP
	8-28	Sand, loamy fine sand, gravelly loamy sand	GM, GP, SM, SP	A-1, A-2, A-3	0	0-5	65-100	60-95	25-70	2-35	0-14	NP
	28-72	Gravelly fine sandy loam, gravelly sandy loam, gravelly loam	GM, SM	A-2, A-4	0-7	0-10	65-85	55-85	40-60	25-45	20-25	NP-5
W:												
Water-----------	—	—	—	—	—	—	—	—	—	—	—	---

Table 16.—Physical Properties of the Soils

(Entries under "Erosion factors—T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
2:												
Lovewell, stratified substratum---------	0-11	7-20	0.95-1.35	0.6-2	0.20-0.35	0.0-2.9	2.0-8.0	.32	.32	5	3	86
	11-30	7-20	0.95-1.40	0.6-2	0.20-0.45	0.0-2.9	0.5-2.0	.49	.49			
	30-50	5-18	1.10-1.50	0.6-2	0.18-0.40	0.0-2.9	0.0-1.0	.49	.49			
	50-75	0-18	1.30-1.50	6-20	0.04-0.08	0.0-2.9	0.0-0.5	.20	—			
5:												
Fluvaquents, frequently flooded-	0-12	7-27	0.90-1.20	0.06-6	0.15-0.25	0.0-2.9	4.0-15	.32	.32	3	6	---
	12-72	7-35	1.20-1.60	0.06-20	0.03-0.16	0.0-2.9	0.0-1.0	.28	.32			
Fluvaquents, frequently flooded-	0-12	7-27	0.90-1.20	0.06-6	0.15-0.25	0.0-2.9	4.0-9.0	.32	.32	3	6	48
	12-72	7-35	1.20-1.60	0.06-20	0.03-0.16	0.0-2.9	0.0-1.0	.28	.32			
Udifluvents, frequently flooded-	0-12	5-27	1.10-1.50	0.2-20	0.03-0.15	0.0-2.9	1.0-6.0	.28	.32	3	3	86
	12-72	2-35	1.20-1.70	0.06-20	0.03-0.16	0.0-2.9	—	—	—			
6:												
Redwater------------	0-7	4-18	1.15-1.40	0.6-2	0.14-0.21	0.0-2.9	3.0-6.0	.28	.28	3	5	56
	7-38	4-18	1.20-1.45	0.6-2	0.10-0.20	0.0-2.9	—	.28	.28			
	38-50	1-10	1.25-1.55	2-20	0.01-0.10	0.0-2.9	—	.20	.24			
	50-60	—	—	0.0000-20	—	—	—	—	—			
15B:												
Waddington----------	0-9	4-20	0.90-1.20	0.6-2	0.08-0.13	0.0-2.9	2.0-6.0	.17	.24	3	5	86
	9-26	4-20	1.20-1.40	2-6	0.07-0.14	0.0-2.9	—	.17	.20			
	26-31	4-10	1.30-1.50	6-20	0.01-0.08	0.0-2.9	—	.17	.24			
	31-72	0-10	1.30-1.50	6-20	0.01-0.08	0.0-2.9	—	.17	.24			
18A:												
Adams---------------	0-7	2-10	1.00-1.30	6-20	0.06-0.12	0.0-2.9	2.0-6.0	.17	.17	5	2	134
	7-9	2-15	1.00-1.30	6-20	0.08-0.16	0.0-2.9	1.0-3.0	.17	.17			
	9-27	0-5	1.10-1.45	6-20	0.03-0.10	0.0-2.9	1.0-3.0	.17	.17			
	27-72	0-5	1.20-1.50	20-101	0.03-0.04	0.0-2.9	0.0-0.5	.17	.17			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
18B:												
Adams	0-7	2-10	1.00-1.30	6-20	0.06-0.12	0.0-2.9	2.0-6.0	.17	.17	5	2	134
	7-9	2-15	1.00-1.30	6-20	0.08-0.16	0.0-2.9	1.0-3.0	.17	.17			
	9-27	0-5	1.10-1.45	6-20	0.03-0.10	0.0-2.9	1.0-3.0	.17	.17			
	27-72	0-5	1.20-1.50	20-101	0.03-0.04	0.0-2.9	0.0-0.5	.17	.17			
20A:												
Croghan	0-1	0-0	—	0.2-6	0.20-0.50	—	35-80	—	—	5	2	134
	1-3	0-5	1.10-1.50	6-20	0.05-0.09	0.0-2.9	2.0-8.0	.17	.17			
	3-9	0-7	1.10-1.50	6-20	0.05-0.09	0.0-2.9	1.0-4.0	.17	.17			
	9-33	0-5	1.20-1.50	20-101	0.03-0.07	0.0-2.9	—	.17	.17			
	33-72	0-5	1.20-1.50	20-101	0.03-0.06	0.0-2.9	—	.17	.17			
33:												
Wainola	0-1	0-0	—	0.2-6	0.20-0.50	—	35-80	—	—	5	2	134
	1-7	0-10	1.35-1.50	6-20	0.10-0.12	0.0-2.9	1.0-8.0	.17	.17			
	7-22	0-10	1.35-1.50	6-20	0.06-0.11	0.0-2.9	0.6-1.0	.15	.15			
	22-34	0-10	1.35-1.45	6-20	0.06-0.11	0.0-2.9	0.0-0.5	.15	.15			
	34-72	0-8	1.25-1.50	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
39A:												
Churchville	0-11	27-40	1.00-1.25	0.6-2	0.16-0.21	0.0-2.9	2.0-9.0	.49	—	5	6	---
	11-22	27-60	1.20-1.40	0.06-0.2	0.13-0.17	3.0-5.9	—	.28	—			
	22-72	4-40	1.50-1.80	0.06-0.2	0.07-0.17	0.0-2.9	—	.28	—			
39B:												
Churchville	0-11	27-40	1.00-1.25	0.6-2	0.16-0.21	0.0-2.9	2.0-9.0	.49	—	5	6	---
	11-22	27-60	1.20-1.40	0.06-0.2	0.13-0.17	3.0-5.9	—	.28	—			
	22-72	4-40	1.50-1.80	0.06-0.2	0.07-0.17	0.0-2.9	—	.28	—			
40B:												
Heuvelton	0-6	27-40	1.00-1.25	0.2-2	0.16-0.21	3.0-5.9	2.0-6.0	.37	.37	5	6	48
	6-10	27-60	1.15-1.40	0.2-2	0.13-0.17	3.0-5.9	—	.28	.28			
	10-39	27-65	1.15-1.40	0.2-2	0.13-0.17	3.0-5.9	—	.28	.28			
	39-72	27-65	1.15-1.65	0.0015-0.2	0.13-0.17	3.0-5.9	—	.28	.28			
40C:												
Heuvelton	0-6	27-40	1.00-1.25	0.2-2	0.16-0.21	3.0-5.9	2.0-6.0	.37	.37	5	6	48
	6-10	27-60	1.15-1.40	0.2-2	0.13-0.17	3.0-5.9	—	.28	.28			
	10-39	27-65	1.15-1.40	0.2-2	0.13-0.17	3.0-5.9	—	.28	.28			
	39-72	27-65	1.15-1.65	0.0015-0.2	0.13-0.17	3.0-5.9	—	.28	.28			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
41A:												
Muskellunge---------	0-9	27-40	1.00-1.25	0.2-0.6	0.16-0.21	3.0-5.9	2.0-9.0	.49	.49	5	6	48
	9-38	27-65	1.20-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
	38-72	40-65	1.15-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
41B:												
Muskellunge---------	0-9	27-40	1.00-1.25	0.2-0.6	0.16-0.21	3.0-5.9	2.0-9.0	.49	.49	5	6	48
	9-38	27-65	1.20-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
	38-72	40-65	1.15-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
42:												
Adjidaumo-----------	0-7	40-55	1.00-1.25	0.2-0.6	0.14-0.18	3.0-5.9	4.0-10	.37	.37	5	4	86
	7-36	27-60	1.20-1.40	0.06-0.2	0.12-0.14	3.0-5.9	1.0-4.0	.28	.28			
	36-72	27-65	1.20-1.40	0.0015-0.2	0.12-0.14	3.0-5.9	0.5-2.0	.28	.28			
43:												
Adjidaumo, mucky silty clay---------	0-7	40-55	0.60-1.10	0.2-0.6	0.15-0.20	3.0-5.9	6.0-25	.37	.37	5	4	86
	7-36	27-60	1.20-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
	36-72	27-65	1.20-1.40	0.0015-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
44:												
Mino----------------	0-9	4-18	1.20-1.50	0.6-2	0.16-0.20	0.0-2.9	2.0-8.0	.28	.28	5	3	86
	9-24	4-18	1.20-1.50	0.6-2	0.13-0.20	0.0-2.9	—	.28	.28			
	24-78	4-18	1.20-1.50	0.6-2	0.13-0.20	0.0-2.9	—	.28	.28			
45:												
Sciota--------------	0-9	1-5	1.35-1.50	6-20	0.07-0.09	0.0-2.9	2.0-8.0	.15	.15	5	1	220
	9-37	1-5	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.0-1.0	.15	.15			
	37-72	1-5	1.30-1.60	6-20	0.04-0.10	0.0-2.9	0.0-0.0	.15	.15			
46:												
Deinache------------	0-9	1-5	1.35-1.50	6-20	0.10-0.18	0.0-2.9	2.0-10	.15	.15	5	1	220
	9-44	1-5	1.35-1.45	6-20	0.05-0.10	0.0-2.9	0.0-2.0	.15	.15			
	44-72	1-20	1.40-1.70	0.6-6	0.12-0.20	0.0-2.9	0.0-0.5	.20	.20			
47B:												
Elmwood-------------	0-6	4-18	1.00-1.30	2-6	0.13-0.20	0.0-2.9	3.0-7.0	.28	.28	5	3	86
	6-25	4-18	1.15-1.45	2-6	0.13-0.22	0.0-2.9	0.5-2.0	.32	.32			
	25-72	27-65	1.35-1.70	0.0015-0.2	0.12-0.18	3.0-5.9	0.0-0.5	.49	.49			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
48:												
Swanton-------------	0-9	7-20	1.00-1.30	2-6	0.13-0.25	0.0-2.9	2.0-9.0	.28	.28	5	3	86
	9-31	5-20	1.15-1.45	2-6	0.12-0.20	0.0-2.9	0.5-3.0	.32	.32			
	31-72	27-60	1.40-1.70	0.0015-0.2	0.11-0.16	3.0-5.9	0.0-0.5	.49	.49			
49:												
Munuscong-----------	0-8	4-20	1.30-1.65	2-6	0.13-0.15	0.0-2.9	4.0-15	.20	.20	5	3	86
	8-26	4-20	1.30-1.70	2-6	0.12-0.17	0.0-2.9	0.0-0.5	.24	.24			
	26-98	27-65	1.35-1.70	0.06-0.2	0.08-0.18	6.0-8.9	0.0-0.5	.28	.28			
50:												
Hailesboro----------	0-9	10-27	1.20-1.50	0.6-2	0.22-0.25	0.0-2.9	2.0-8.0	.49	.49	5	5	56
	9-30	18-35	1.20-1.50	0.2-0.6	0.22-0.25	0.0-2.9	—	.49	.49			
	30-72	5-35	1.20-1.50	0.2-0.6	0.12-0.20	0.0-2.9	—	.64	.64			
51:												
Wegatchie-----------	0-8	7-27	1.00-1.25	0.6-2	0.20-0.35	0.0-2.9	4.0-10	.49	.49	5	5	56
	8-40	18-35	1.20-1.40	0.2-0.6	0.15-0.20	0.0-2.9	—	.49	.49			
	40-72	18-35	1.20-1.55	0.2-0.6	0.15-0.20	0.0-2.9	—	.49	.49			
53B:												
Nicholville---------	0-9	7-18	1.20-1.50	0.6-2	0.16-0.22	0.0-2.9	2.0-6.0	.49	.49	5	5	56
	9-20	7-18	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	—	.64	.64			
	20-34	5-18	1.45-1.65	0.6-2	0.10-0.20	0.0-2.9	—	.64	.64			
	34-72	2-20	1.45-1.65	0.6-2	0.12-0.20	0.0-2.9	—	.49	.49			
60C:												
Grenville-----------	0-9	4-18	1.10-1.40	0.6-2	0.16-0.20	0.0-2.9	2.0-6.0	.32	.32	3	5	56
	9-17	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	17-35	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	35-72	4-18	1.60-1.85	0.2-0.6	0.06-0.13	0.0-2.9	—	.24	.28			
61B:												
Hogansburg----------	0-10	4-18	1.10-1.40	0.6-2	0.16-0.20	0.0-2.9	2.0-6.0	.32	.32	3	5	56
	10-19	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	19-35	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	35-72	4-18	1.70-1.95	0.2-0.6	0.06-0.13	0.0-2.9	—	.24	.28			
62A:												
Malone--------------	0-9	4-22	1.10-1.40	0.6-2	0.09-0.16	0.0-2.9	2.0-8.0	.20	.28	3	5	56
	9-30	4-18	1.20-1.50	0.06-0.6	0.08-0.15	0.0-2.9	—	.20	.24			
	30-72	4-18	1.70-1.90	0.06-0.6	0.06-0.14	0.0-2.9	—	.20	.24			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
62B:												
Malone	0-9	4-22	1.10-1.40	0.6-2	0.09-0.16	0.0-2.9	2.0-8.0	.20	.28	3	5	56
	9-30	4-18	1.20-1.50	0.06-0.6	0.08-0.15	0.0-2.9	—	.20	.24			
	30-72	4-18	1.70-1.90	0.06-0.6	0.06-0.14	0.0-2.9	—	.20	.24			
64:												
Runeberg	0-9	4-18	1.40-1.55	0.6-2	0.15-0.20	0.0-2.9	6.0-30	.20	.20	4	5	56
	9-22	4-18	1.60-1.80	0.2-0.6	0.12-0.18	0.0-2.9	0.5-2.0	.28	.28			
	22-72	4-18	1.75-1.85	0.06-0.6	0.06-0.13	0.0-2.9	0.0-0.5	.28	.28			
66:												
Matoon	0-8	27-40	1.00-1.25	0.2-0.6	0.14-0.18	3.0-5.9	3.0-7.0	.49	.49	2	6	48
	8-12	25-55	1.10-1.30	0.2-0.6	0.12-0.14	3.0-5.9	—	.28	.28			
	12-27	35-60	1.20-1.40	0.06-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
	27-37	—	—	0.0000-20	—	—	—	—	—			
68B:												
Fahey	0-9	7-18	1.10-1.40	6-20	0.07-0.13	0.0-2.9	2.0-8.0	.17	.17	5	2	134
	9-27	2-10	1.25-1.55	6-20	0.02-0.05	0.0-2.9	1.0-3.0	.15	.17			
	27-45	0-8	1.45-1.65	6-20	0.01-0.03	0.0-2.9	0.0-1.0	.10	.17			
	45-72	4-20	1.40-1.65	0.2-2	0.07-0.14	0.0-2.9	0.0-0.5	.24	.32			
69A:												
Coveytown	0-8	4-10	1.10-1.40	2-20	0.04-0.08	0.0-2.9	2.0-8.0	.20	.17	5	2	134
	8-28	0-10	1.25-1.55	2-20	0.02-0.07	0.0-2.9	0.5-2.0	.17	.20			
	28-72	4-20	1.50-1.80	0.2-2	0.08-0.11	0.0-2.9	0.0-0.5	.24	.28			
70:												
Guff	0-9	27-40	1.00-1.25	0.0015-0.2	0.14-0.18	3.0-5.9	4.0-8.0	.37	.37	2	4	86
	9-39	27-60	1.20-1.40	0.0015-0.2	0.12-0.14	3.0-5.9	—	.28	.28			
	39-49	—	—	0.0000-20	—	—	—	—	—			
94B:												
Neckrock	0-9	7-20	1.10-1.40	0.6-2	0.10-0.20	0.0-2.9	2.0-6.0	.28	.28	2	5	---
	9-17	7-20	1.10-1.40	0.6-2	0.09-0.19	0.0-2.9	0.0-2.0	.20	.28			
	17-27	18-22	1.30-1.60	0.2-2	0.10-0.20	0.0-2.9	0.0-1.0	.20	.28			
	27-32	7-20	1.45-1.75	0.2-2	0.09-0.18	0.0-2.9	0.0-0.0	.20	.28			
	32-40	—	—	0.0000-20	0.00-0.00	—	—	—	—			
Summerville	0-5	4-22	1.30-1.60	0.6-2	0.18-0.22	0.0-2.9	2.0-6.0	.32	.32	1	5	---
	5-12	4-22	1.35-1.65	0.6-2	0.10-0.16	0.0-2.9	0.0-0.5	.24	.24			
	12-20	—	—	0.0000-20	—	—	—	—	—			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
94C:												
Neckrock------------	0-9	7-20	1.10-1.40	0.6-2	0.10-0.20	0.0-2.9	2.0-6.0	.28	.28	2	5	56
	9-17	7-20	1.10-1.40	0.6-2	0.09-0.19	0.0-2.9	0.0-2.0	.20	.28			
	17-27	18-22	1.30-1.60	0.2-2	0.10-0.20	0.0-2.9	0.0-1.0	.20	.28			
	27-32	7-20	1.45-1.75	0.2-2	0.09-0.18	0.0-2.9	0.0-0.0	.20	.28			
	32-40	—	—	0.0000-20	0.00-0.00	—	—	—	—			
Summerville---------	0-5	4-22	1.30-1.60	0.6-2	0.18-0.22	0.0-2.9	2.0-6.0	.32	.32	1	5	56
	5-12	4-22	1.35-1.65	0.6-2	0.10-0.16	0.0-2.9	0.0-0.5	.24	.24			
	12-20	—	—	0.0000-20	—	—	—	—	—			
101:												
Wonsqueak-----------	0-7	0-6	0.10-0.30	0.2-6	0.20-0.40	—	60-100	—	—	2	8	0
	7-31	0-6	0.10-0.30	0.2-6	0.20-0.40	—	50-99	—	—			
	31-72	4-30	1.50-1.70	0.2-2	0.06-0.16	0.0-2.9	0.0-2.0	.49	.49			
104:												
Udorthents, wet substratum---------	0-4	4-27	1.20-1.80	0.06-20	0.06-0.15	0.0-2.9	0.0-5.0	.37	.37	5	8	0
	4-72	4-40	1.30-1.90	0.06-6	0.04-0.13	0.0-2.9	—	.32	.37			
105:												
Udorthents, smoothed	0-4	4-27	1.20-1.80	0.06-20	0.06-0.15	0.0-2.9	0.0-5.0	.37	.37	5	5	56
	4-72	4-35	1.30-1.90	0.06-6	0.04-0.13	0.0-2.9	—	.32	.37			
107:												
Udorthents, Loamy---	0-4	4-27	1.20-1.80	0.06-20	0.06-0.15	0.0-2.9	0.0-5.0	.37	.37	-	—	—-
	4-72	4-35	1.30-1.90	0.06-6	0.04-0.13	0.0-2.9	—	.32	.37			
110:												
Borosaprists--------	0-7	0-0	0.30-0.60	0.2-6	0.35-0.45	0.0-2.9	50-100	—	—	2	5	—-
	7-30	0-0	0.30-0.60	0.2-6	0.35-0.45	0.0-2.9	50-100	—	—			
	30-72	4-45	1.55-1.95	0.2-20	0.11-0.24	3.0-5.9	0.0-0.5	.28	.37			
Fluvaquents---------	0-5	4-27	0.90-1.20	0.06-6	0.15-0.25	0.0-2.9	4.0-9.0	.32	.32	3	6	48
	5-72	4-35	1.20-1.60	0.06-20	0.03-0.16	0.0-2.9	0.0-1.0	.28	.32			
144:												
Roundabout----------	0-9	7-18	0.85-1.25	0.2-2	0.25-0.35	0.0-2.9	2.0-9.0	.43	.43	5	5	56
	9-31	7-18	1.30-1.60	0.2-2	0.20-0.30	0.0-2.9	0.0-4.0	.64	.64			
	31-72	7-40	1.40-1.70	0.06-0.6	0.16-0.26	0.0-2.9	0.0-0.5	.64	.64			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
147A:												
Flackville----------	0-12	2-10	1.10-1.50	6-20	0.08-0.09	0.0-2.9	2.0-6.0	.17	.17	5	1	310
	12-26	0-6	1.20-1.60	6-20	0.05-0.07	0.0-2.9	0.0-1.0	.17	.17			
	26-72	27-65	1.15-1.40	0.0015-0.2	0.12-0.17	3.0-5.9	0.0-0.5	.28	.28			
147B:												
Flackville----------	0-12	2-10	1.10-1.50	6-20	0.08-0.09	0.0-2.9	2.0-6.0	.17	.17	5	1	310
	12-26	0-6	1.20-1.60	6-20	0.05-0.07	0.0-2.9	0.0-1.0	.17	.17			
	26-72	27-65	1.15-1.40	0.0015-0.2	0.12-0.17	3.0-5.9	0.0-0.5	.28	.28			
148:												
Stockholm-----------	0-10	1-10	1.10-1.50	2-6	0.05-0.09	0.0-2.9	2.0-12	.17	.17	5	2	134
	10-23	0-7	1.20-1.50	2-6	0.06-0.08	0.0-2.9	—	.17	.17			
	23-30	27-65	1.15-1.40	0.0015-0.06	0.12-0.17	3.0-5.9	—	.17	.17			
	30-72	27-65	1.15-1.40	0.0015-0.06	0.12-0.17	3.0-5.9	—	.17	.17			
149:												
Pinconning----------	0-9	1-10	1.00-1.20	6-20	0.12-0.14	0.0-2.9	2.0-15	.17	.17	3	2	134
	9-36	0-10	1.40-1.55	6-20	0.06-0.11	0.0-2.9	0.0-0.5	.17	.17			
	36-72	27-65	1.50-1.70	0.0015-0.2	0.08-0.12	6.0-8.9	0.0-0.5	.32	.32			
181:												
Dorval--------------	0-31	0-0	0.13-0.42	0.6-6	0.20-0.25	—	50-95	—	—	2	2	134
	31-72	27-65	1.40-1.65	0.0015-0.06	0.10-0.20	6.0-8.9	0.0-8.0	.28	.28			
260C:												
Grenville, very stony--------------	0-9	4-18	1.10-1.40	0.6-2	0.16-0.20	0.0-2.9	2.0-6.0	.32	.32	3	8	0
	9-17	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	17-35	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	35-72	4-18	1.60-1.85	0.2-0.6	0.06-0.13	0.0-2.9	—	.24	.28			
261B:												
Hogansburg, very stony--------------	0-10	4-18	1.10-1.40	0.6-2	0.16-0.20	0.0-2.9	2.0-6.0	.32	.32	3	8	0
	10-19	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	19-35	4-18	1.25-1.50	0.6-2	0.08-0.15	0.0-2.9	—	.24	.28			
	35-72	4-18	1.70-1.95	0.2-0.6	0.06-0.13	0.0-2.9	—	.24	.28			
263B:												
Malone, very stony--	0-9	4-22	1.10-1.40	0.6-2	0.09-0.16	0.0-2.9	2.0-8.0	.20	.28	3	8	0
	9-30	4-18	1.20-1.50	0.06-0.6	0.08-0.15	0.0-2.9	—	.20	.24			
	30-72	4-18	1.70-1.90	0.06-0.6	0.06-0.14	0.0-2.9	—	.20	.24			

Table 16.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
264:												
Runeberg, very stony	0-9	4-18	1.40-1.55	0.6-2	0.15-0.20	0.0-2.9	6.0-30	.20	.20	4	8	0
	9-22	4-18	1.60-1.80	0.2-0.6	0.12-0.18	0.0-2.9	0.5-2.0	.28	.28			
	22-72	4-18	1.75-1.85	0.06-0.6	0.06-0.13	0.0-2.9	0.0-0.5	.28	.28			
270B:												
Coveytown, very stony---------------	0-8	4-10	1.10-1.40	2-20	0.04-0.08	0.0-2.9	2.0-8.0	.20	.17	5	8	0
	8-28	0-10	1.25-1.55	2-20	0.02-0.07	0.0-2.9	0.5-2.0	.17	.20			
	28-72	4-20	1.50-1.80	0.2-2	0.08-0.11	0.0-2.9	0.0-0.5	.24	.28			
W:												
Water---------------	—	—	—	—	—	—	—	—	—	-	—	—-

Table 17.—Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
2:				
Lovewell, stratified substratum----------	0-11	4.0-11	4.5-6.5	0
	11-30	1.0-5.0	4.5-6.5	0
	30-50	1.0-3.0	4.5-6.5	0
	50-75	1.0-2.0	4.5-6.5	0
5:				
Fluvaquents, frequently flooded--	0-12	40-50	5.1-7.8	0-3
	12-72	3.0-25	5.1-7.8	0-5
Fluvaquents, frequently flooded--	0-12	40-50	5.1-7.8	0-3
	12-72	3.0-25	5.1-7.8	0-5
Udifluvents, frequently flooded--	0-12	—	4.5-7.3	0
	12-72	—	5.1-7.8	0
6:				
Redwater-------------	0-7	10-40	5.1-6.5	0
	7-38	8.0-30	6.1-7.3	0
	38-50	6.0-25	6.1-7.3	0-1
	50-60	—	—	—
15B:				
Waddington-----------	0-9	—	6.1-7.3	0
	9-26	—	6.6-7.8	0
	26-31	—	6.6-8.4	0-5
	31-72	—	7.4-8.4	3-10
18A:				
Adams----------------	0-7	—	3.6-5.5	0
	7-9	—	4.5-5.5	0
	9-27	—	4.5-6.0	0
	27-72	1.0-5.0	4.5-6.5	0
18B:				
Adams----------------	0-7	—	3.6-5.5	0
	7-9	—	4.5-5.5	0
	9-27	—	4.5-6.0	0
	27-72	1.0-5.0	4.5-6.5	0
20A:				
Croghan--------------	0-1	—	3.5-6.0	—
	1-3	—	3.6-6.0	0
	3-9	—	4.5-6.0	0
	9-33	—	4.5-6.0	0
	33-72	—	4.5-6.0	0
33:				
Wainola--------------	0-1	—	4.5-6.5	—
	1-7	5.0-15	4.5-6.5	0
	7-22	—	4.5-6.5	0
	22-34	1.0-5.0	4.5-6.5	0
	34-72	1.0-5.0	4.5-6.5	0

Table 17.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
39A:				
Churchville----------	0-11	—	5.6-7.3	0
	11-22	—	6.1-7.8	0-3
	22-72	—	7.4-8.4	3-10
39B:				
Churchville----------	0-11	—	5.6-7.3	0
	11-22	—	6.1-7.8	0-3
	22-72	—	7.4-8.4	3-10
40B:				
Heuvelton------------	0-6	—	5.1-7.3	0
	6-10	—	5.1-7.3	0
	10-39	—	5.6-7.8	0-5
	39-72	—	6.6-8.4	3-10
40C:				
Heuvelton------------	0-6	—	5.1-7.3	0
	6-10	—	5.1-7.3	0
	10-39	—	5.6-7.8	0-5
	39-72	—	6.6-8.4	3-10
41A:				
Muskellunge----------	0-9	—	5.1-7.3	0
	9-38	—	5.1-7.8	0-5
	38-72	—	6.6-8.4	3-10
41B:				
Muskellunge----------	0-9	—	5.1-7.3	0
	9-38	—	5.1-7.8	0-5
	38-72	—	6.6-8.4	3-10
42:				
Adjidaumo------------	0-7	—	6.1-7.3	0
	7-36	—	6.6-7.8	0-3
	36-72	—	7.4-8.4	1-5
43:				
Adjidaumo, mucky silty clay----------	0-7	—	6.1-7.3	0
	7-36	—	6.6-7.8	0-3
	36-72	—	7.4-8.4	1-5
44:				
Mino-----------------	0-9	—	5.1-6.5	0
	9-24	—	5.6-7.3	0
	24-78	—	6.1-8.4	0-5
45:				
Sciota---------------	0-9	9.0-15	5.6-7.3	0
	9-37	2.0-8.0	6.1-7.8	0-2
	37-72	1.0-5.0	6.6-8.4	0-5
46:				
Deinache-------------	0-9	10-20	5.1-7.3	0
	9-44	1.0-9.0	6.6-8.4	0
	44-72	2.0-11	6.6-8.4	0-5
47B:				
Elmwood--------------	0-6	—	4.5-6.5	0
	6-25	4.0-18	4.5-6.5	0
	25-72	3.0-15	5.6-7.8	0-5

Table 17.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
48:				
Swanton	0-9	5.0-12	5.1-7.3	0
	9-31	4.0-16	5.1-7.3	0
	31-72	3.0-15	5.6-8.4	0-3
49:				
Munuscong	0-8	5.0-15	6.1-7.8	0
	8-26	2.0-10	6.1-7.8	0-5
	26-98	10-30	7.4-8.4	5-10
50:				
Hailesboro	0-9	8.0-12	5.6-7.3	0
	9-30	5.0-13	5.6-7.8	0-1
	30-72	5.0-10	6.6-8.4	0-5
51:				
Wegatchie	0-8	—	5.6-7.3	0
	8-40	—	6.1-7.8	0-3
	40-72	—	6.6-8.4	1-10
53B:				
Nicholville	0-9	—	3.6-6.0	0
	9-20	—	4.5-6.0	0
	20-34	—	4.5-6.5	0
	34-72	—	4.5-6.5	0
60C:				
Grenville	0-9	—	5.1-6.5	0
	9-17	—	5.6-7.3	0-3
	17-35	—	7.4-8.4	3-10
	35-72	—	7.4-8.4	3-10
61B:				
Hogansburg	0-10	17-25	5.1-7.3	0
	10-19	10-20	5.1-7.8	0-5
	19-35	10-20	5.1-8.4	3-10
	35-72	8.0-25	7.4-8.4	3-10
62A:				
Malone	0-9	10-25	5.6-6.5	0
	9-30	15-40	6.1-7.3	0
	30-72	15-40	6.6-8.4	1-10
62B:				
Malone	0-9	10-25	5.6-6.5	0
	9-30	15-40	6.1-7.3	0
	30-72	15-40	6.6-8.4	1-10
64:				
Runeberg	0-9	25-55	6.1-7.3	0
	9-22	5.0-20	6.1-7.8	0-3
	22-72	3.0-12	7.4-8.4	3-10
66:				
Matoon	0-8	—	6.1-7.3	0
	8-12	—	6.6-7.8	0-1
	12-27	—	6.6-7.8	0-5
	27-37	—	—	—

Table 17.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
68B:				
Fahey----------------	0-9	—	4.5-5.5	0
	9-27	10-35	5.1-7.3	0
	27-45	5.0-20	5.6-7.3	0
	45-72	3.0-10	5.6-8.4	0-3
69A:				
Coveytown------------	0-8	5.0-25	5.1-6.5	0
	8-28	5.0-15	5.6-7.3	0-1
	28-72	2.0-12	6.1-8.4	0-5
70:				
Guff-----------------	0-9	—	5.6-7.3	0
	9-39	—	6.6-8.4	0-5
	39-49	—	—	—
94B:				
Neckrock-------------	0-9	15-25	5.6-7.8	0
	9-17	8.0-18	5.6-7.8	0
	17-27	10-20	5.6-8.4	0-3
	27-32	4.0-11	6.6-8.4	3-10
	32-40	—	—	—
Summerville----------	0-5	5.0-15	6.1-8.4	0-5
	5-12	2.0-15	6.1-8.4	0-10
	12-20	—	—	—
94C:				
Neckrock-------------	0-9	15-25	5.6-7.8	0
	9-17	8.0-18	5.6-7.8	0
	17-27	10-20	5.6-8.4	0-3
	27-32	4.0-11	6.6-8.4	3-10
	32-40	—	—	—
Summerville----------	0-5	5.0-15	6.1-8.4	0-5
	5-12	2.0-15	6.1-8.4	0-10
	12-20	—	—	—
101:				
Wonsqueak------------	0-7	—	4.0-6.5	0
	7-31	20-50	4.5-6.5	0
	31-72	1.0-3.0	5.1-7.3	0
104:				
Udorthents, wet substratum----------	0-4	—	4.5-7.3	0
	4-72	—	5.1-7.8	0-3
105:				
Udorthents, smoothed-	0-4	—	4.5-7.3	0
	4-72	—	5.1-7.8	0-5
107:				
Udorthents, Loamy----	0-4	—	4.5-7.3	0
	4-72	—	5.1-7.8	0-5
110:				
Borosaprists---------	0-7	90-160	4.5-7.3	0
	7-30	90-160	4.5-7.3	0
	30-72	—	5.1-7.3	0

Table 17.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
110:				
Fluvaquents----------	0-5	40-50	5.1-7.8	0-3
	5-72	3.0-25	5.1-7.8	0-5
144:				
Roundabout-----------	0-9	2.0-10	4.5-6.5	0
	9-31	1.0-4.0	4.5-6.5	0
	31-72	5.0-8.0	5.6-8.4	0-5
147A:				
Flackville-----------	0-12	—	5.1-6.5	0
	12-26	—	5.1-7.3	0
	26-72	—	6.6-8.4	0-5
147B:				
Flackville-----------	0-12	—	5.1-6.5	0
	12-26	—	5.1-7.3	0
	26-72	—	6.6-8.4	0-5
148:				
Stockholm------------	0-10	—	3.6-6.0	0
	10-23	—	5.1-6.0	0
	23-30	—	5.1-6.5	0
	30-72	—	6.6-8.4	0-5
149:				
Pinconning-----------	0-9	10-20	5.6-7.8	0
	9-36	1.0-6.0	6.1-7.8	0-3
	36-72	12-18	7.4-8.4	3-10
181:				
Dorval---------------	0-31	100-160	5.1-7.8	0
	31-72	18-30	6.1-8.4	0-5
260C:				
Grenville, very stony	0-9	—	5.1-6.5	0
	9-17	—	5.6-7.3	0-3
	17-35	—	7.4-8.4	3-10
	35-72	—	7.4-8.4	3-10
261B:				
Hogansburg, very stony---------------	0-10	17-25	5.1-7.3	0
	10-19	10-20	5.1-7.8	0-5
	19-35	10-20	5.1-8.4	3-10
	35-72	8.0-25	7.4-8.4	3-10
263B:				
Malone, very stony---	0-9	10-25	5.6-6.5	0
	9-30	15-40	6.1-7.3	0
	30-72	15-40	6.6-8.4	1-10
264:				
Runeberg, very stony-	0-9	25-55	6.1-7.3	0
	9-22	5.0-20	6.1-7.8	0-3
	22-72	3.0-12	7.4-8.4	3-10

Table 17.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate
	In	meq/100 g	pH	Pct
270B:				
Coveytown, very stony	0-8	5.0-25	5.1-6.5	0
	8-28	5.0-15	5.6-7.3	0-1
	28-72	2.0-12	6.1-8.4	0-5
W:				
Water----------------	—	—	—	—

Table 18.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In	In			
2:							
Lovewell, stratified substratum------------	—	—	0	—	High	Moderate	Moderate
5:							
Fluvaquents, frequently flooded---------------	—	—	—	—	—	—	--
Fluvaquents, frequently flooded---------------	—	—	0	—	High	High	High
Udifluvents, frequently flooded---------------	—	—	0	—	Moderate	High	High
6:							
Redwater---------------	Bedrock (lithic)	40-60	0	—	High	Moderate	Low
15B:							
Waddington-------------	—	—	0	—	Moderate	Low	Low
18A:							
Adams------------------	—	—	0	—	Low	Low	High
18B:							
Adams------------------	—	—	0	—	Low	Low	High
20A:							
Croghan----------------	—	—	0	—	Moderate	Low	High
33:							
Wainola----------------	—	—	0	—	Moderate	Low	Moderate
39A:							
Churchville------------	Abrupt textural change	20-40	—	—	High	High	Low
39B:							
Churchville------------	Abrupt textural change	20-40	—	—	High	High	Low
40B:							
Heuvelton--------------	—	—	0	—	High	High	Low
40C:							
Heuvelton--------------	—	—	0	—	High	High	Low
41A:							
Muskellunge------------	—	—	0	—	High	High	Low
41B:							
Muskellunge------------	—	—	0	—	High	High	Low
42:							
Adjidaumo--------------	—	—	0	—	High	High	Low
43:							
Adjidaumo, mucky silty clay------------------	—	—	0	—	High	High	Low

Table 18.—Soil Features—Continued

Map symbol and soil name	Restrictive layer		Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Initial	Total		Uncoated steel	Concrete
		In	In	In			
44:							
Mino	—	—	0	—	High	Moderate	Moderate
45:							
Sciota	—	—	0	—	Moderate	Low	Moderate
46:							
Deinache	—	—	0	—	Moderate	High	Low
47B:							
Elmwood	Abrupt textural change	18-40	0	—	High	Moderate	Moderate
48:							
Swanton	Abrupt textural change	18-40	0	—	High	High	Moderate
49:							
Munuscong	Abrupt textural change	20-40	0	—	High	High	Low
50:							
Hailesboro	—	—	0	—	High	High	Low
51:							
Wegatchie	—	—	0	—	High	High	Low
53B:							
Nicholville	—	—	0	—	High	Low	Moderate
60C:							
Grenville	Dense material	17-40	0	—	Moderate	Low	Low
61B:							
Hogansburg	Dense material	18-35	0	—	High	Moderate	Low
62A:							
Malone	Dense material	18-36	0	—	High	High	Moderate
62B:							
Malone	Dense material	18-36	0	—	High	High	Moderate
64:							
Runeberg	—	—	0	—	High	High	Low
66:							
Matoon	Bedrock (lithic)	20-40	0	—	High	High	Low
68B:							
Fahey	—	—	0	—	Low	Low	High
69A:							
Coveytown	—	—	0	—	Moderate	Moderate	Moderate
70:							
Guff	Bedrock (lithic)	20-40	0	—	High	High	Low
94B:							
Neckrock	Bedrock (lithic)	20-40	0	—	Moderate	Low	Low
Summerville	Bedrock (lithic)	10-20	0	—	Moderate	Low	Low

Table 18.—Soil Features—Continued

Map symbol and soil name	Restrictive layer		Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Initial	Total		Uncoated steel	Concrete
		In	In	In			
94C:							
Neckrock	Bedrock (lithic)	20-40	0	—	Moderate	Low	Low
Summerville	Bedrock (lithic)	10-20	0	—	Moderate	Low	Low
101:							
Wonsqueak	—	—	0	—	High	Moderate	Moderate
104:							
Udorthents, wet substratum	—	—	—	—	High	Moderate	Moderate
105:							
Udorthents, smoothed	—	—	—	—	Moderate	Low	Moderate
107:							
Udorthents, Loamy	—	—	—	—	Moderate	Low	Low
110:							
Borosaprists	—	—	—	—	High	Moderate	Moderate
Fluvaquents	—	—	0	—	High	High	High
144:							
Roundabout	—	—	0	—	High	High	Moderate
147A:							
Flackville	Abrupt textural change	20-40	0	—	Moderate	Low	Moderate
147B:							
Flackville	Abrupt textural change	20-40	0	—	Moderate	Low	Moderate
148:							
Stockholm	Abrupt textural change	17-39	0	—	Moderate	High	High
149:							
Pinconning	Abrupt textural change	20-40	0	—	Moderate	High	Moderate
181:							
Dorval	—	—	4-12	25-30	High	High	Moderate
260C:							
Grenville, very stony	Dense material	17-40	0	—	Moderate	Low	Low
261B:							
Hogansburg, very stony	Dense material	18-35	0	—	High	Moderate	Low
263B:							
Malone, very stony	Dense material	18-36	0	—	High	High	Moderate
264:							
Runeberg, very stony	—	—	0	—	High	High	Low
270B:							
Coveytown, very stony	—	—	0	—	Moderate	Moderate	Moderate
W:							
Water	—	—	—	—	—	—	—

Table 19.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
2:									
Lovewell, stratified substratum	B								
		January	1.5-3.0	>6.0	—	—	None	—	None
		February	1.5-3.0	>6.0	—	—	None	—	None
		March	1.5-3.0	>6.0	—	—	None	Brief	Occasional
		April	1.5-3.0	>6.0	—	—	None	Brief	Occasional
		May	1.5-3.0	>6.0	—	—	None	Brief	Occasional
		June	—	—	—	—	None	Brief	Occasional
		July	—	—	—	—	None	Brief	Occasional
		August	—	—	—	—	None	Brief	Occasional
		September	—	—	—	—	None	Brief	Occasional
		October	—	—	—	—	None	Brief	Occasional
		November	1.5-3.0	>6.0	—	—	None	—	None
		December	1.5-3.0	>6.0	—	—	None	—	None
5:									
Fluvaquents, frequently Flooded (poorly drained)	D								
		January	0.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		February	0.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		March	0.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		April	0.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		May	0.0-1.5	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		June	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		July	—	—	—	—	None	Brief	Frequent
		September	—	—	—	—	None	Brief	Frequent
		October	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Brief	Frequent
		November	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Brief	Frequent
		December	0.0-1.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
Fluvaquents, frequently flooded	D								
		January	0.5-1.5	>6.0	—	—	None	Long	Frequent
		February	0.5-1.5	>6.0	—	—	None	Long	Frequent
		March	0.5-1.5	>6.0	—	—	None	Long	Frequent
		April	0.5-1.5	>6.0	—	—	None	Long	Frequent
		May	0.5-1.5	>6.0	—	—	None	Long	Frequent

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Fluvaquents, frequently flooded	D								
		June	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		July	—	—	—	—	None	Brief	Frequent
		September	—	—	—	—	None	Brief	Frequent
		October	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		November	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		December	0.5-1.5	>6.0	—	—	None	Brief	Frequent
Udifluvents, frequently flooded	B								
		January	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		February	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		March	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		April	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		May	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		June	—	—	—	—	None	Brief	Frequent
		October	—	—	—	—	None	Brief	Frequent
		November	2.0-6.0	>6.0	—	—	None	Brief	Frequent
		December	2.0-6.0	>6.0	—	—	None	Brief	Frequent
6:									
Redwater	B								
		January	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		February	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		March	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		April	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		May	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		November	0.5-1.5	>6.0	—	—	None	Brief	Frequent
		December	0.5-1.5	>6.0	—	—	None	Brief	Frequent
15B:									
Waddington	A								
		Jan-Dec	—	—	—	—	None	—	None
18A:									
Adams	A								
		Jan-Dec	—	—	—	—	None	—	None
18B:									
Adams	A								
		Jan-Dec	—	—	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
20A:									
Croghan	B								
		January	1.5-2.0	>6.0	—	—	None	—	None
		February	1.5-2.0	>6.0	—	—	None	—	None
		March	1.5-2.0	>6.0	—	—	None	—	None
		April	1.5-2.0	>6.0	—	—	None	—	None
		May	1.5-2.0	>6.0	—	—	None	—	None
		November	1.5-2.0	>6.0	—	—	None	—	None
		December	1.5-2.0	>6.0	—	—	None	—	None
33:									
Wainola	B								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
39A:									
Churchville	D								
		January	1.0-1.5	1.7-3.3	—	—	None	—	None
		February	1.0-1.5	1.7-3.3	—	—	None	—	None
		March	1.0-1.5	1.7-3.3	—	—	None	—	None
		April	1.0-1.5	1.7-3.3	—	—	None	—	None
		May	1.0-1.5	1.7-3.3	—	—	None	—	None
		November	1.0-1.5	1.7-3.3	—	—	None	—	None
		December	1.0-1.5	1.7-3.3	—	—	None	—	None
39B:									
Churchville	D								
		January	1.0-1.5	1.7-3.3	—	—	None	—	None
		February	1.0-1.5	1.7-3.3	—	—	None	—	None
		March	1.0-1.5	1.7-3.3	—	—	None	—	None
		April	1.0-1.5	1.7-3.3	—	—	None	—	None
		May	1.0-1.5	1.7-3.3	—	—	None	—	None
		November	1.0-1.5	1.7-3.3	—	—	None	—	None
		December	1.0-1.5	1.7-3.3	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
40B:									
Heuvelton-----------------	C								
		January	1.5-2.0	1.6-3.3	—	—	None	—	None
		February	1.5-2.0	1.6-3.3	—	—	None	—	None
		March	1.5-2.0	1.6-3.3	—	—	None	—	None
		April	1.5-2.0	1.6-3.3	—	—	None	—	None
		November	1.5-2.0	1.6-3.3	—	—	None	—	None
		December	1.5-2.0	1.6-3.3	—	—	None	—	None
40C:									
Heuvelton-----------------	C								
		January	1.5-2.0	1.6-3.3	—	—	None	—	None
		February	1.5-2.0	1.6-3.3	—	—	None	—	None
		March	1.5-2.0	1.6-3.3	—	—	None	—	None
		April	1.5-2.0	1.6-3.3	—	—	None	—	None
		November	1.5-2.0	1.6-3.3	—	—	None	—	None
		December	1.5-2.0	1.6-3.3	—	—	None	—	None
41A:									
Muskellunge---------------	D								
		January	1.0-1.5	1.7-3.3	—	—	None	—	None
		February	1.0-1.5	1.7-3.3	—	—	None	—	None
		March	1.0-1.5	1.7-3.3	—	—	None	—	None
		April	1.0-1.5	1.7-3.3	—	—	None	—	None
		May	1.0-1.5	1.7-3.3	—	—	None	—	None
		November	1.0-1.5	1.7-3.3	—	—	None	—	None
		December	1.0-1.5	1.7-3.3	—	—	None	—	None
41B:									
Muskellunge---------------	D								
		January	1.0-1.5	1.7-3.3	—	—	None	—	None
		February	1.0-1.5	1.7-3.3	—	—	None	—	None
		March	1.0-1.5	1.7-3.3	—	—	None	—	None
		April	1.0-1.5	1.7-3.3	—	—	None	—	None
		May	1.0-1.5	1.7-3.3	—	—	None	—	None
		November	1.0-1.5	1.7-3.3	—	—	None	—	None
		December	1.0-1.5	1.7-3.3	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
42:									
Adjidaumo	D								
		January	0.0-0.5	>6.0	—	—	None	—	None
		February	0.0-0.5	>6.0	—	—	None	—	None
		March	0.0-0.5	>6.0	—	—	None	—	None
		April	0.0-0.5	>6.0	—	—	None	—	None
		May	0.0-0.5	>6.0	—	—	None	—	None
		June	0.0-0.5	>6.0	—	—	None	—	None
		November	0.0-0.5	>6.0	—	—	None	—	None
		December	0.0-0.5	>6.0	—	—	None	—	None
43:									
Adjidaumo, mucky silty clay	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		May	0.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		June	0.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		November	0.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		December	0.0	>6.0	0.0-1.0	Brief	Occasional	—	None
44:									
Mino	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
45:									
Sciota	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
46:									
Deinache	A/D								
		January	0.0-1.0	>6.0	—	—	None	—	None
		February	0.0-1.0	>6.0	—	—	None	—	None
		March	0.0-1.0	>6.0	—	—	None	—	None
		April	0.0-1.0	>6.0	—	—	None	—	None
		May	0.0-1.0	>6.0	—	—	None	—	None
		November	0.0-1.0	>6.0	—	—	None	—	None
		December	0.0-1.0	>6.0	—	—	None	—	None
47B:									
Elmwood	C								
		January	1.5-3.0	1.5-3.3	—	—	None	—	None
		February	1.5-3.0	1.5-3.3	—	—	None	—	None
		March	1.5-3.0	1.5-3.3	—	—	None	—	None
		April	1.5-3.0	1.5-3.3	—	—	None	—	None
		May	1.5-3.0	1.5-3.3	—	—	None	—	None
		November	1.5-3.0	1.5-3.3	—	—	None	—	None
		December	1.5-3.0	1.5-3.3	—	—	None	—	None
48:									
Swanton	C/D								
		January	1.0-1.5	1.5-3.3	—	—	None	—	None
		February	1.0-1.5	1.5-3.3	—	—	None	—	None
		March	1.0-1.5	1.5-3.3	—	—	None	—	None
		April	1.0-1.5	1.5-3.3	—	—	None	—	None
		May	1.0-1.5	1.5-3.3	—	—	None	—	None
		November	1.0-1.5	1.5-3.3	—	—	None	—	None
		December	1.0-1.5	1.5-3.3	—	—	None	—	None
49:									
Munuscong	B/D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		May	0.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		November	0.0-1.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		December	0.0-1.0	>6.0	0.0-1.0	Brief	Occasional	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
50:									
Hailesboro	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		June	1.0-1.5	>6.0	—	—	None	—	None
		October	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
51:									
Wegatchie	D								
		January	0.0-1.0	>6.0	—	—	None	—	None
		February	0.0-1.0	>6.0	—	—	None	—	None
		March	0.0-1.0	>6.0	—	—	None	—	None
		April	0.0-1.0	>6.0	—	—	None	—	None
		May	0.0-1.0	>6.0	—	—	None	—	None
		June	0.0-1.0	>6.0	—	—	None	—	None
		November	0.0-1.0	>6.0	—	—	None	—	None
		December	0.0-1.0	>6.0	—	—	None	—	None
53B:									
Nicholville	C								
		January	1.5-2.0	1.5-3.2	—	—	None	—	None
		February	1.5-2.0	1.5-3.2	—	—	None	—	None
		March	1.5-2.0	1.5-3.2	—	—	None	—	None
		April	1.5-2.0	1.5-3.2	—	—	None	—	None
		May	1.5-2.0	1.5-3.2	—	—	None	—	None
		November	1.5-2.0	1.5-3.2	—	—	None	—	None
		December	1.5-2.0	1.5-3.2	—	—	None	—	None
60C:									
Grenville	B								
		Jan-Dec	—	—	—	—	None	—	None
61B:									
Hogansburg	B								
		March	1.5-2.0	1.5-2.8	—	—	None	—	None
		April	1.5-2.0	1.5-2.8	—	—	None	—	None
		May	1.5-2.0	1.5-2.8	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
62A:									
Malone	C								
		January	1.0-1.5	1.5-3.0	—	—	None	—	None
		February	1.0-1.5	1.5-3.0	—	—	None	—	None
		March	1.0-1.5	1.5-3.0	—	—	None	—	None
		April	1.0-1.5	1.5-3.0	—	—	None	—	None
		May	1.0-1.5	1.5-3.0	—	—	None	—	None
		November	1.0-1.5	1.5-3.0	—	—	None	—	None
		December	1.0-1.5	1.5-3.0	—	—	None	—	None
62B:									
Malone	C								
		January	1.0-1.5	1.5-3.0	—	—	None	—	None
		February	1.0-1.5	1.5-3.0	—	—	None	—	None
		March	1.0-1.5	1.5-3.0	—	—	None	—	None
		April	1.0-1.5	1.5-3.0	—	—	None	—	None
		May	1.0-1.5	1.5-3.0	—	—	None	—	None
		November	1.0-1.5	1.5-3.0	—	—	None	—	None
		December	1.0-1.5	1.5-3.0	—	—	None	—	None
64:									
Runeberg	C/D								
		January	0.0-1.0	1.8-3.0	—	—	None	—	None
		February	0.0-1.0	1.8-3.0	—	—	None	—	None
		March	0.0-1.0	1.8-3.0	—	—	None	—	None
		April	0.0-1.0	1.8-3.0	—	—	None	—	None
		May	0.0-1.0	1.8-3.0	—	—	None	—	None
		June	0.0-1.0	1.8-3.0	—	—	None	—	None
		July	0.0-1.0	1.8-3.0	—	—	None	—	None
		November	0.0-1.0	1.8-3.0	—	—	None	—	None
		December	0.0-1.0	1.8-3.0	—	—	None	—	None
66:									
Matoon	D								
		January	0.5-1.5	1.6-3.3	—	—	None	—	None
		February	0.5-1.5	1.6-3.3	—	—	None	—	None
		March	0.5-1.5	1.6-3.3	—	—	None	—	None
		April	0.5-1.5	1.6-3.3	—	—	None	—	None
		May	0.5-1.5	1.6-3.3	—	—	None	—	None
		November	0.5-1.5	1.6-3.3	—	—	None	—	None
		December	0.5-1.5	1.6-3.3	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
68B:									
Fahey	B								
		March	1.5-2.0	>6.0	—	—	None	—	None
		April	1.5-2.0	>6.0	—	—	None	—	None
		May	1.5-2.0	>6.0	—	—	None	—	None
69A:									
Coveytown	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
70:									
Guff	D								
		January	0.0-0.5	>6.0	—	—	None	—	None
		February	0.0-0.5	>6.0	—	—	None	—	None
		March	0.0-0.5	>6.0	—	—	None	—	None
		April	0.0-0.5	>6.0	—	—	None	—	None
		May	0.0-0.5	>6.0	—	—	None	—	None
		June	0.0-0.5	>6.0	—	—	None	—	None
		November	0.0-0.5	>6.0	—	—	None	—	None
		December	0.0-0.5	>6.0	—	—	None	—	None
94B:									
Neckrock	B								
		Jan-Dec	—	—	—	—	None	—	None
Summerville	D								
		Jan-Dec	—	—	—	—	None	—	None
94C:									
Neckrock	B								
		Jan-Dec	—	—	—	—	None	—	None
Summerville	D								
		Jan-Dec	—	—	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
101:									
Wonsqueak-----------------	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	—	None
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	—	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		June	0.0-0.5	>6.0	—	—	None	—	None
		July	0.0-0.5	>6.0	—	—	None	—	None
		September	0.0-0.5	>6.0	—	—	None	—	None
		October	0.0-0.5	>6.0	—	—	None	—	None
		November	0.0-0.5	>6.0	—	—	None	—	None
		December	0.0-0.5	>6.0	—	—	None	—	None
104:									
Udorthents, wet substratum	C								
		January	1.0-3.0	>6.0	—	—	None	—	None
		February	1.0-3.0	>6.0	—	—	None	—	None
		March	1.0-3.0	>6.0	—	—	None	—	None
		April	1.0-3.0	>6.0	—	—	None	—	None
		May	1.0-3.0	>6.0	—	—	None	—	None
		June	1.0-3.0	>6.0	—	—	None	—	None
		July	1.0-3.0	>6.0	—	—	None	—	None
		October	1.0-3.0	>6.0	—	—	None	—	None
		November	1.0-3.0	>6.0	—	—	None	—	None
		December	1.0-3.0	>6.0	—	—	None	—	None
105:									
Udorthents, smoothed------	A								
		January	3.0	>6.0	—	—	None	—	None
		February	3.0	>6.0	—	—	None	—	None
		March	3.0	>6.0	—	—	None	—	None
		April	3.0	>6.0	—	—	None	—	None
		May	3.0	>6.0	—	—	None	—	None
		June	3.0	>6.0	—	—	None	—	None
		November	3.0	>6.0	—	—	None	—	None
		December	3.0	>6.0	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
107:									
Udorthents, Loamy	A								
		January	3.0	>6.0	—	—	None	—	None
		February	3.0	>6.0	—	—	None	—	None
		March	3.0	>6.0	—	—	None	—	None
		April	3.0	>6.0	—	—	None	—	None
		May	3.0	>6.0	—	—	None	—	None
		June	3.0	>6.0	—	—	None	—	None
		November	3.0	>6.0	—	—	None	—	None
		December	3.0	>6.0	—	—	None	—	None
110:									
Borosaprists	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	Brief	Occasional
		February	0.0	>6.0	0.0-1.0	Long	Frequent	Brief	Occasional
		March	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		April	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		May	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Occasional
		June	0.0	>6.0	0.0-1.0	Brief	Frequent	Brief	Occasional
		July	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	—	None
		September	0.0-1.0	>6.0	—	—	None	—	None
		October	0.0-1.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		November	0.0-1.0	>6.0	0.0-1.0	Brief	Occasional	—	None
		December	0.0	>6.0	0.0-1.0	Long	Frequent	Brief	Occasional
Fluvaquents	D								
		January	0.0	>6.0	0.0-1.0	Brief	Occasional	Long	Frequent
		February	0.0	>6.0	0.0-1.0	Brief	Occasional	Long	Frequent
		March	0.0	>6.0	0.0-2.0	Brief	Occasional	Long	Frequent
		April	0.0	>6.0	0.0-2.0	Brief	Occasional	Long	Frequent
		May	0.0-1.5	>6.0	0.0-1.0	Brief	Occasional	Long	Frequent
		June	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		July	—	—	—	—	None	Long	Frequent
		September	—	—	—	—	None	Long	Frequent
		October	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		November	0.5-1.5	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent
		December	0.0-1.0	>6.0	0.0-0.5	Brief	Occasional	Long	Frequent

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
144:									
Roundabout	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
147A:									
Flackville	C								
		January	1.5-2.0	1.7-3.3	—	—	None	—	None
		February	1.5-2.0	1.7-3.3	—	—	None	—	None
		March	1.5-2.0	1.7-3.3	—	—	None	—	None
		April	1.5-2.0	1.7-3.3	—	—	None	—	None
		May	1.5-2.0	1.7-3.3	—	—	None	—	None
		November	1.5-2.0	1.7-3.3	—	—	None	—	None
		December	1.5-2.0	1.7-3.3	—	—	None	—	None
147B:									
Flackville	C								
		January	1.5-2.0	1.7-3.3	—	—	None	—	None
		February	1.5-2.0	1.7-3.3	—	—	None	—	None
		March	1.5-2.0	1.7-3.3	—	—	None	—	None
		April	1.5-2.0	1.7-3.3	—	—	None	—	None
		May	1.5-2.0	1.7-3.3	—	—	None	—	None
		November	1.5-2.0	1.7-3.3	—	—	None	—	None
		December	1.5-2.0	1.7-3.3	—	—	None	—	None
148:									
Stockholm	C								
		January	0.0-1.0	1.4-3.2	—	—	None	—	None
		February	0.0-1.0	1.4-3.2	—	—	None	—	None
		March	0.0-1.0	1.4-3.2	—	—	None	—	None
		April	0.0-1.0	1.4-3.2	—	—	None	—	None
		May	0.0-1.0	1.4-3.2	—	—	None	—	None
		November	0.0-1.0	1.4-3.2	—	—	None	—	None
		December	0.0-1.0	1.4-3.2	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
149:									
Pinconning----------------	B/D								
		January	0.0-1.0	1.7-3.3	0.0-1.0	Long	Frequent	—	None
		February	0.0-1.0	1.7-3.3	0.0-1.0	Long	Frequent	—	None
		March	0.0-1.0	1.7-3.3	0.0-1.0	Long	Frequent	—	None
		April	0.0-1.0	1.7-3.3	0.0-1.0	Long	Frequent	—	None
		May	0.0-1.0	1.7-3.3	—	—	None	—	None
		October	0.0-1.0	1.7-3.3	—	—	None	—	None
		November	0.0-1.0	1.7-3.3	—	—	None	—	None
		December	0.0-1.0	1.7-3.3	—	—	None	—	None
181:									
Dorval--------------------	A/D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		November	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
		December	0.0	>6.0	0.0-1.0	Long	Frequent	—	None
260C:									
Grenville, very stony-----	B								
		Jan-Dec	—	—	—	—	None	—	None
261B:									
Hogansburg, very stony----	B								
		March	1.5-2.0	1.5-2.8	—	—	None	—	None
		April	1.5-2.0	1.5-2.8	—	—	None	—	None
		May	1.5-2.0	1.5-2.8	—	—	None	—	None
263B:									
Malone, very stony--------	C								
		January	1.0-1.5	1.5-3.0	—	—	None	—	None
		February	1.0-1.5	1.5-3.0	—	—	None	—	None
		March	1.0-1.5	1.5-3.0	—	—	None	—	None
		April	1.0-1.5	1.5-3.0	—	—	None	—	None
		May	1.0-1.5	1.5-3.0	—	—	None	—	None
		November	1.0-1.5	1.5-3.0	—	—	None	—	None
		December	1.0-1.5	1.5-3.0	—	—	None	—	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
264:									
Runeberg, very stony	C/D								
		January	0.0-1.0	1.8-3.0	—	—	None	—	None
		February	0.0-1.0	1.8-3.0	—	—	None	—	None
		March	0.0-1.0	1.8-3.0	—	—	None	—	None
		April	0.0-1.0	1.8-3.0	—	—	None	—	None
		May	0.0-1.0	1.8-3.0	—	—	None	—	None
		June	0.0-1.0	1.8-3.0	—	—	None	—	None
		July	0.0-1.0	1.8-3.0	—	—	None	—	None
		November	0.0-1.0	1.8-3.0	—	—	None	—	None
		December	0.0-1.0	1.8-3.0	—	—	None	—	None
270B:									
Coveytown, very stony	C								
		January	1.0-1.5	>6.0	—	—	None	—	None
		February	1.0-1.5	>6.0	—	—	None	—	None
		March	1.0-1.5	>6.0	—	—	None	—	None
		April	1.0-1.5	>6.0	—	—	None	—	None
		May	1.0-1.5	>6.0	—	—	None	—	None
		November	1.0-1.5	>6.0	—	—	None	—	None
		December	1.0-1.5	>6.0	—	—	None	—	None
W:									
Water	—								
		Jan-Dec	—	—	—	—	None	—	None

Table 20.—Classification of the Soils

Soil name	Family or higher taxonomic class
Adams	Sandy, mixed, frigid Typic Haplorthods
Adjidaumo	Fine, mixed, nonacid, frigid Mollic Endoaquepts
Borosaprists	Borosaprists
Churchville	Fine, illitic, mesic Aeric Epiaqualfs
Coveytown	Sandy over loamy, mixed, nonacid, frigid Aeric Endoaquents
Croghan	Sandy, mixed, frigid Aquic Haplorthods
Deinache	Mixed, frigid Mollic Psammaquents
Dorval	Clayey, mixed, euic Terric Borosaprists
Elmwood	Coarse-loamy over clayey, mixed, frigid Aquic Dystric Eutrochrepts
Fahey	Sandy-skeletal, mixed, frigid Aquentic Haplorthods
Flackville	Sandy over clayey, mixed, frigid Aquic Haplorthods
Fluvaquents	Fluvaquents
Grenville	Coarse-loamy, mixed, frigid Typic Eutrochrepts
Guff	Fine, mixed, nonacid, frigid Mollic Endoaquepts
Hailesboro	Fine-silty, mixed, frigid Aeric Endoaqualfs
Heuvelton	Fine, mixed, frigid Aquic Glossoboralfs
Hogansburg	Coarse-loamy, mixed, frigid Aquic Eutrochrepts
Lovewell	Coarse-silty, mixed, frigid Fluvaquentic Dystrochrepts
Malone	Coarse-loamy, mixed, active, nonacid, frigid Aeric Epiaquepts
Matoon	Fine, mixed, superactive, frigid Aeric Epiaqualfs
Mino	Coarse-loamy, mixed, active, nonacid, frigid Aeric Endoaquepts
Munuscong	Coarse-loamy over clayey, mixed, nonacid, frigid Mollic Epiaquepts
Muskellunge	Fine, mixed, superactive, frigid Aeric Epiaqualfs
Neckrock	Fine-loamy, mixed, frigid Eutric Glossoboralfs
Nicholville	Coarse-silty, mixed, frigid Aquic Haplorthods
Pinconning	Sandy over clayey, mixed, nonacid, frigid Mollic Epiaquents
Redwater	Coarse-loamy, mixed, frigid Fluvaquentic Eutrochrepts
Roundabout	Coarse-silty, mixed, nonacid, frigid Aeric Epiaquepts
Runeberg	Coarse-loamy, mixed, frigid Typic Endoaquolls
Sciota	Mixed, frigid Aquic Udipsamments
Stockholm	Sandy over clayey, mixed, superactive, frigid Typic Epiaquods
Summerville	Loamy, mixed, frigid Lithic Eutrochrepts
Swanton	Coarse-loamy over clayey, mixed, nonacid, frigid Aeric Epiaquepts
Udifluvents	Udifluvents
Udorthents	Udorthents
Udorthents, Loamy	Udorthents
Waddington	Loamy-skeletal, mixed, frigid Typic Eutrochrepts
Wainola	Sandy, mixed, frigid Typic Endoaquods
Wegatchie	Fine-silty, mixed, nonacid, frigid Mollic Endoaquepts
Wonsqueak	Loamy, mixed, euic Terric Borosaprists

Table 21.--Relationship Between Parent Material, Position, and Drainage of Soil Series

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
Soils on Glacial Till Plains							
Very deep, medium and moderately coarse textured glacial till with carbonates within 40 inches deep.			Grenville	Hogansburg	Malone		Runeberg
Moderately deep, medium and moderately coarse textured till over limestone or dolomitic limestone.			Neckrock				
Shallow, medium and moderately coarse textured till over limestone bedrock.			Summerville				
Soils on Glacial Till Plains with Water-Worked Mantile							
Very deep, coarse textured subsoil overlying a medium textured till substratum at 20-40 inches deep.					Coveytown		
Soils on Outwash Plains, Eskers, and Glacial Beach Deposits							
Very deep, moderately coarse textured beach deposits with coarse textured calcareous substratum; averaging >35 percent rock fragments.		Waddington					
Very deep, coarse textured beach deposits with spodic horizon; averages >35 percent rock fragments.				Fahey			

Table 21.—Relationship Between Parent Material, Position, and Drainage of Soil Series—Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
Soils on Outwash Plains, Eskers, and Glacial Beach Deposits							
Very deep, coarse textured outwash deposits with spodic horizon; averages >35 percent rock fragments.	Colton						
Very deep, coarse textured deltaic and outwash deposits; few rock fragments.					Sciota	Deinache	
Very deep, coarse textured outwash with spodic horizon; few rock fragments.		Adams		Croghan	Wainola		
Soils on Lacustrine and Marine Plains							
Very deep, coarse textured outwash over lacustrine clay and silt; /f.				Flackville		Stockholm	Pinconning
Very deep, medium and moderately coarse textured sediments over lacustrine clay and silt.				Elmwood	Swanton		Munuscong
Moderately deep, fine textured sediments in glacial lake and marine environments with limestone bedrock at 20-40 inches deep.					Matoon	Guff	
Very deep, fine textured sediments that are 20-40 inches thick overlying firm, medium or moderately coarse textured till deposits.					Churchville		

Table 21.—Relationship Between Parent Material, Position, and Drainage of Soil Series—Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
Soils on Lacustrine and Marine Plains							
Very deep, fine textured sediments in glacial lake and marine environments with calcareous substrata.				Heuvelton	Muskellunge	Adjidaumo	Adjidaumo
Very deep, medium and moderately fine textured lacustrine sediments; averaging 18 to 35 percent clay by weight.					Hailesboro	Wegatchie	
Very deep, medium textured lacustrine sediments averaging < 18 percent clay by weight, and less than 15 percent sand or coarser material between 10-40 inches deep.				Nicholville	Roundabout		
Very deep, medium textured lacustrine sediments averaging < 18 percent clay by weight, and equal to or more than 15 percent fine sand or coarser material 10-40 inches deep.					Mino		
Soils on Floodplains in Valleys							
Very deep, medium textured alluvium with contrasting or stratified deposits below 40 inches deep; occasional flooding.				Lovewell			
Deep, moderately coarse and medium textured alluvial sediments with limestone bedrock between 40-60 inches deep; occasional flooding.					Redwater		

Table 21.—Relationship Between Parent Material, Position, and Drainage of Soil Series—Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
Soils on Floodplains in Valleys							
Very deep alluvial sediments of various textures; frequently flooded.			Udifluvents		Fluvaquents	Fluvaquents	
Soils Formed in Swamps and Bogs							
Very deep soil with organic deposits 16-51 inches thick over moderately coarse to moderately fine textured deposits; pH is equal to or > 4.5 in some layer.							Wonsqueak; Borosaprists
Very deep soil with organic deposits 16-51 inches thick over fine textured deposits; pH > 4.5 throughout.							Dorval Borosaprists
Very deep soil with well-decomposed organic deposits more than 16 inches thick; ponded during most of the year.							Borosaprists
Very deep soils formed in mainly medium textured grayish mineral material; ponded during most of the year.							Fluvaquents
Disturbed by Human Activities							
Very deep, moderately coarse to moderately fine textured, mixed soil material.			Udorthents		Udorthents		

* texture refers to dominant subsoil texture

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