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Soil Survey of Hancock County, Ohio

In cooperation with
Ohio Department of
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Conservation; Ohio
Agricultural Research
and Development Center;
Ohio State University Extension;
Hancock Soil and Water Conservation District;
and Hancock County Commissioners

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Interim Report

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Cover: Clockwise from upper left: A typical farmstead on Tuscola silt loam, 2 to 6 percent slopes; A profile of the well drained Fox loam, 2 to 6 percent slopes; Urbanization on Blount and Glynwood soils; A riparian corridor on Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded, along the Blanchard River; Grassed waterway on Blount silt loam, 2 to 4 percent slopes.

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Preface

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

Soil Survey of Hancock County, Ohio

By Rick A. Robbins and Mark M. Feusner, Ohio Department of Natural Resources, Division of Soil and Water Conservation, and Jeffrey A. Glanville, United States Department of Agriculture, Natural Resources Conservation Service

Fieldwork by Rick A. Robbins and Mark M. Feusner, Ohio Department of Natural Resources, Division of Soil and Water Conservation

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with Ohio Department of Natural Resources, Division of Soil and Water Conservation, and Ohio Agricultural Research and Development Center, Ohio State University Extension, Hancock County Commissioners, and the Hancock Soil and Water Conservation District

Figure 1. Location of Hancock County in Ohio.

Hancock County is in the northwestern part of Ohio (fig. 1). It is adjacent to Wood County on the north, Seneca and Wyandot counties on the east, Hardin County on the south, and Allen and Putnam counties on the west. Hancock County has an area of 341,561 acres, or about 534 square miles. Findlay, the county seat, is located near the center of the county. In 1990, the population of the county was 65,536 and the population of Findlay was 35,703 (USDC, 1990).

Most of the county is used for agriculture. The main enterprises are cash-grain farming and some livestock production and dairy operations. Urban or built-up land makes up about 11 percent of the county (Hancock Soil and Water Conservation District, 1995). Urban areas, especially in areas adjacent to Findlay and along the Interstate 75 corridor, are increasing at a rate far beyond that of the rest of the county. Manufacturing is the largest source of employment in the county. The service and retail trade industries are also important sources of employment.

The survey area is mostly nearly level or gently sloping. The areas of more sloping topography are on end moraines or are related to dissection along streams and river valleys. Wetness is the main limitation affecting most of the soils in the county. The hazard of erosion is also a concern in gently sloping or sloping areas.

The county has some locally unique physiographic features. A large outlier of bedrock known locally as Limestone Ridge is in the east-central part of the county. The northern part of the county was the lakebed for Glacial Lake Maumee, and the Findlay Basin, in the west-central part of the county, was an embayment to the Lake. Relict beach ridges are obvious along State Route 613 and State Route 12. These ridges mark the margins of Glacial Lake Maumee and the Findlay Basin.

This soil survey updates the survey of Hancock County published in 1973 (Rapparlie and Urban, 1973). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides some general information about the survey area. It describes climate; history; physiography, relief, and drainage; glacial geology; bedrock geology; natural resources; and transportation facilities.

Climate

Hancock County is cold in winter and hot in summer. Winter precipitation, frequently in the form of snow, results in a good accumulation of soil moisture by spring and minimizes drought during the summer. Normal annual precipitation patterns are adequate for all of the crops that are adapted to the temperature and the growing season in the survey area.

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

In winter, the average temperature is 26.0 degrees F and the average daily minimum temperature is 18.7 degrees. The lowest temperature on record, which occurred at Findlay on January 19, 1994, is -20 degrees. In summer, the average temperature is 70.9 degrees and the average daily maximum temperature is 81.4 degrees. The highest recorded temperature, which occurred on June 25, 1988, is 104 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 (50 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 precipitation is about 36.29 inches. Of this, 20.7 inches, or 57 percent, usually falls in May through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall on record was 6.25 inches on September 1, 1959. Thunderstorms occur on about 37 days each year, and most occur between May and August.

The average seasonal snowfall is about 29 inches. The greatest snow depth at any one time during the period of record was 23 inches. On the average, 45 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year. The heaviest 1-day snowfall on record was 15.2 inches on January 31, 1982.

The average relative humidity in midafternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 84 percent. The sun shines 67 percent of the time possible in summer and 41 percent in winter. The prevailing wind is from the southwest. Average wind speed is highest, 11 miles per hour, in January through April.

History

Prior to settlement by European immigrants, the latest inhabitants of the survey area were the native Americans of Wyandot and Ottawa culture. These people grew corn and other crops in small clearings to supplement their diet.

From the French and Indian War in 1756 until the War of 1812, the area had been the scene of hostilities among the Indians, the American colonists, France, and England. The defeat of the native Americans and others in the War of 1812 and the acquisition of their lands opened the way for settlement of the county.

During the early stages of growth, settlers came from other Ohio settlements, from Virginia, and from the northeastern states. Most were of German, English, Irish, and Scottish descent (Beardsley, 1881). These settlers began clearing the vast forest area so they could raise livestock and cultivate crops. Initially, the settlers cultivated the better drained, rolling soils along streams and the higher areas on end moraines. Cattle, hogs, and sheep were pastured in the remaining areas of woodland and on the wetter soils. Corn, wheat, and hay were raised for local consumption. It was not until the later 1800's, with the advent of tiling and ditching, that large areas of fertile lowlands and marshes were opened to cultivation.

Agriculture has played a dominant role in the settlement and development of Hancock County. The oil boom in the late 1800's was responsible for providing an influx of inhabitants to the county. Even with the present-day economic dependence on industry and manufacturing, Hancock County still relies heavily on the economic base provided by the agricultural industry.

Physiography, Relief, and Drainage

Hancock County is part of the Central Lowland Province. Most of the physiographic features in the county are a result of the Wisconsinan glaciation. As an area of lake plain and till plain physiography, Hancock County has a relatively uniform, level topography. The highest point in the county is about 955 feet above sea level, along the Hardin County line, in Orange Township. The lowest point in the county is about 715 feet above sea level, where the Rader Creek enters Wood County, in Pleasant Township. Most of the county has slope of 6 percent or less. The steeper areas

are associated with end moraines, stream dissection, or on bedrock ridges.

Hancock County drains northward into Lake Erie. There are 5 distinct watershed areas in the county. The primary watersheds include the Blanchard River draining north and west and the Portage River, which drains north. The other watersheds are drained by small creeks.

Mineral Resources

The mineral resources of Hancock County include bedrock, sand, and gravel.

Most of these resources have been of minor extent, mainly because of the relatively thin deposits of high-quality materials for wide commercial use. Natural gas and oil were extracted heavily from the underlying bedrock extensively during the latter part of the 19th century (Wickstrom, 1992).

Dolostone and limestone are the major components of Hancock County bedrock. These rocks compose the Salina, Greenfield, Lockport, Tymochtee groups, which formed during the Silurian Age (ODNR-DGS, 1999). Limestone has been mined from these formations in several areas of the county; however, only the quarry in the city of Findlay is currently active. Since limestone is at or near the surface in Hancock County, many small inactive limestone quarries are scattered throughout the county. Most of the limestone is used for agricultural or industrial uses or for use in the transportation industry.

Small sand and gravel pits are scattered throughout the county, mostly along beach ridges, rivers, and streams. No sites in the county are currently being quarried. The sand and gravel deposits are of limited size, ranging from 1 to 10 acres. The largest gravel pit was along a beach ridge in the north-central part of the county. This pit was about 25 acres in size at the time it was abandoned.

Glacial Geology

Richard R. Pavey, Ohio Department of Natural Resources, Division of Geological Survey, assisted in the preparation of this section.

Refer to the Geomorphic Landform Map for locations of geologic features described in this section.

Significantly later in geological time (about 2 million years ago), glaciers began to move across the area in a southern and western direction. Many glacial advances, with ice as much as 1 mile in thickness, followed by subsequent melting and recessions, filled valleys and low bedrock areas with till and glaciolacustrine sand, silt, and clay. The late Wisconsinan glaciers, approximately 15,000 to 24,000 years ago, were the last glaciers to cover Hancock County (Forsyth, 1961). The glacial ice gouged out a pre-glacial river valley to form the Lake Erie basin. As sheets of ice advanced uphill out of the basin, high bedrock areas obstructed glacial deposition, leaving the bedrock hills thinly covered with drift or completely exposed. Examples of soils that formed in a thin mantle of glacial material over bedrock include Channahon, Millsdale, and Milton soils. Biglick soils formed in residuum on rock outcrops.

Away from the bedrock hills, thicker layers of glacial material were deposited. As the ice sheet melted and receded, the unsorted material carried by the glacier was deposited in a fairly uniform layer known as till. The thickness and composition of till vary widely within the county. Soil formation in the till is generally only a few feet thick. Where these till layers were very thin or eroded away, soils formed in older, harder till. The clay content of the till is highest on the Defiance moraine and in Glacial Lake Maumee basin, and lowest near bedrock areas where the ice sheets eroded and transported some of the coarser local material. Blount, Mortimer, and Pewamo soils are examples of soils formed in till.

As the glacial ice was receding for the last time, the Erie Basin was filled by a series of different lakes that formed in front of the ice sheet. For a few thousand years, lake levels varied in these lakes as drainage outlets were blocked or opened by the fluctuating ice front of the last glacier. Lacustrine sediments settled out of the water in these glacial lakes. Some soils in the county formed in these glaciolacustrine deposits, including Del Rey, Fulton, and Toledo soils.

There are two distinct segments of Glacial Lake Maumee in Hancock County. The main body of the lake lies north of State Route 613. Fluctuating lake levels and wave action smoothed out shallow bottom areas, wave planed the till, and provided coarse sediments to form beaches. Beach ridges in the county are products of these earlier lake levels. Fox, Oshtemo, and Shawtown soils formed in these materials. In the northern part of the county are peculiarly shaped segments of old beach ridges. These provide evidence of the reworking of beach sediments during subsequent higher lake levels, caused by slight readvances of the ice sheet far to the north. In shallow water areas, wave action washed the finer sized particles out of the glacial material leaving patches of coarser sediments on top of the till. Haskins and Mermill soils formed in this water modified till material. Hoytville and Nappanee soils

formed where the till was wave planed by shallow lake water. The Findlay embayment is located in the west central part of the county and lies between State Routes 224 and 12. In the Findlay embayment, a continual source of sediment to the embayment was the outwash plain that extends to the east.

Hancock County had a very dynamic geologic history during the Pleistocene. The exact sequence of events is not well understood, but numerous indicators help piece together the geologic events. There are glaciofluvial sediments buried under 7 to 14 feet of till in the Findlay embayment.

Two end moraines cross Hancock County in a general east-west direction (ODNR-DGS, 1998). The northernmost moraine is the Defiance moraine. The moraine was heavily influenced by Glacial Lake Maumee and its predecessor, especially in the western part of the county, where glaciolacustrine sediments overlie the till. Maumee's predecessor was responsible for the deposition of lacustrine sediments on the crest of the moraine. Numerous small potholes or depressions in the moraine reflect the ice stagnation and wasting by the glacier (fig. 2).

Figure 2. Pothole (closed depressions) topography on the Defiance Moraine. Pewamo silty clay loam, 0 to 1 percent slopes are the darker colored areas and occupy depressions, and Del Rey-Blount complex, 0 to 3 percent slopes, are the lighter colored areas and occupy summits and shoulders.

During the initial level of Lake Maumee, the water reached as approximate level of 800 feet above sea level (Forsyth, 1959). The water reached close to the summit of the moraine and in some cases breached the moraine and joined the Findlay embayment to the south. Today, this moraine also separates the surface water between the Portage River and Blanchard River watersheds.

Fort Wayne moraine is in the southern part of the county. It is not as well defined as the Defiance moraine and does not appear to have had such a dynamic history as the Defiance. Glacial meltwater channels, which were predecessors of modern day stream drainage patterns, fed the Findlay embayment. Modern day streams follow some of these channels but stream piracy has modified the channels drainage patterns in some areas.

Bedrock Geology

Richard R. Pavey, Ohio Department of Natural Resources, Division of Geological Survey, assisted in the preparation of this section.

Hancock County is in the eastern part of the Central Lowland Province. Proceeding from west to east in Hancock County, the underlying bedrock dips and becomes progressively younger. The bedrock within the county is of sedimentary origin, primarily Silurian limestone and dolostone (ODNR-DGS, 1981)

The Salina Undifferentiated Group underlie the western sections of the county, especially in Blanchard, Orange, Pleasant, and Union Townships (ODNR-DGS, 1999). The Tymochtee Group underlies an area in the central to southeastern part of the county, especially in Delaware, Jackson, Madison, Eagle Townships. The Tymochtee group lies east of the Bowling Green fault, which parallels Interstate 75 before turning southeast near Findlay. East of the fault, the bedrock is dominated by the Greenfield and Lockport groups. These groups underlie Biglick, Cass, Marion, and Amanda Townships. (ODNR-DGS, 1999).

The Bowling Green fault is a major structural feature in northwestern Ohio. East of the fault was the primary location of numerous gas and oil wells during the late 1800's (Wickstrom and others, 1992).

During the Silurian to Mississippian times (420 to 350 million years ago) Hancock County was covered by a large, tropical inland sea. In deeper areas, sediments consisting of deposits of carbonate precipitates, shells, and corals formed limestone and dolostone. Silt and clay sediments formed shale, while quartz and other silicate minerals were deposited to form sandstone in shallow water areas. As sedimentation and cementation continued, the pressures generated by the tremendous weight of the overlying sediments formed the bedrock of the county.

This depositional stage was followed by a prolonged period of geologic erosion that left a landscape of bedrock hills and stream valleys. Surface water drained northward into a large, eastward-flowing valley that occupied the present Lake Erie basin. Erosion left the oldest bedrock units exposed in the northwestern part of

the county and the youngest exposed towards the southeast.

Farming

Agriculture is the primary land use in Hancock County. In 1982, farms made up about 292,314 acres, or 86 percent of the land in Hancock County. There were 1299 farms in the county with an average size of 225 acres (USDC, 1993). In 1982, about 263,290 acres was used as cropland (USDC, 1993), and about 5,100 acres was used for pasture. Only about 16,900 acres of the county was urban or built-up land (USDA-SCS, 1987). In 1992, there were 1032 farms that made up 275,644 acres, or 81 percent of the land in Hancock County. The average size was 267 acres. In 1992, about 259,189 acres was used for cropland (USDC, 1993), 6,700 acres was used for pasture, and 27,400 acres was urban or built-up land (USDA-SCS, 1987). These facts reflect the nationwide trends toward larger farms with fewer operators and the conversion of farmland to urban or nonfarm uses.

Although, corn, soybeans, and wheat are the principal crops in the county, the soils and climate are suitable to grain sorghum, sunflower, oats, barley, rye, and buckwheat. Specialty crops, such as tomatoes, sugar beets, and cucumbers, could be grown more extensively in the survey area.

Transportation Facilities

Hancock County is accessible by land and air. Interstate 75 crosses the county from north to south, and provides rapid access to Toledo and Cincinnati. Additional access is provided by 3 Federal highways and 10 State highways. These highways and a system of well paved county and township roads provide easy access to all areas of the county. 4 major railroad lines traverse the county.

Two airports, Bluffton and Findlay Municipal are located in the county.

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 high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

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

Soil Survey Procedures

Hancock County was one of the first counties in northwestern Ohio to have a soil survey modernization. The general procedures followed in making this survey are described in the National Soil Survey Handbook (USDA, 1996) of the Natural Resources Conservation Service. The "Soil Survey of Hancock County, Ohio," issued October 1973 (Rapparlie and Urban, 1973), and U.S. Geological Survey topographic quadrangles were among the references used.

Prior to the soil survey modernization, a soil survey review team conducted an evaluation of the 1973 Hancock County soil survey at the request of the Hancock County Commissioners and Hancock Soil and Water Conservation District. A report of the evaluation was prepared and sent to the Soil Inventory Board for review. After reviewing the evaluation report, the Soil Inventory Board recommended a soil survey modernization program and outlined the work to be completed for the soil survey modernization.

Before the fieldwork began, a detailed study of all existing laboratory data, soil survey reports, and research studies was conducted by the Hancock County soil survey staff. U.S. Geological Survey topographic maps, at a scale of 1:24,000, were used to help the soil scientists relate land and image features.

Hancock County includes a large number of soil series. The 1973 soil survey is a valuable historical document that was relied on extensively during the modernization process. Patterns of soils on the landscape are typically complex. Modern soil science survey procedures differ from those practiced in the earlier survey. Some soil series names used in the old report no longer apply to the soils that were mapped and correlated during this update. Soil scientists making the 1973 survey did not recognize all of the soil series that current soil scientists using modern taxonomy and classification recognized during this survey. In addition, soil observations and evaluations during the 1973 survey were made to depths of 60 inches or less. This modernization project routinely made observations and evaluations to 80 inches or to bedrock.

Recent aerial photographs, photographs from earlier flights, the Geology Map of Ohio (ODNR-DGS, 1981), and the United States Geologic Survey quadrangles were used in making the survey. The maps and soil descriptions in the "Soil Survey of Hancock County, Ohio" (Rapparlie and Urban, 1973) were used as references in the correlation of soil series and map units. The old survey was also used to determine the areas of highest variability when planning mapping and transect intervals.

A reconnaissance was made by vehicle before the soil scientists traversed the surface on foot and examined the soils. As they traversed the surface, the soil scientists divided the landscape into segments based on the use and management of the soils. For example, a rise would be separated from a depression or a gently sloping knoll or backslope from a flat.

Soil map units were traversed at varying intervals depending on the complexity of the soil types and patterns in the area.

Figure 3. Typical soil patterns in Hancock County. The light colored areas are Blount and Glynwood soils, and the darker colored areas are Pewamo soils.

Sample map units from the 1973 survey were transected. Borings were made at selected intervals on the transect to determine the composition of soil types within the map units. Soil scientists compared existing map units with the soil types in the area to see if earlier unrecognized soils with significant interpretive differences should be identified and separated during the survey modernization. Map unit boundaries were determined on the basis of soil examinations, observations, and photo interpretation (fig. 3). When necessary, map units were redelineated so that new series could be included and soil types recognized earlier could be better differentiated. Some map units were enlarged to include units previously mapped as another soil type when the differences in soil properties were not significant enough to require an additional map unit delineation. A data location map denoting where traverses and observations were made is on file at the Northwestern Ohio Soil Survey Project Office in Findlay.

Representative pedon sites from the 1973 survey were located, and the soils at these sites were examined in order to determine if they would meet present-day interpretation needs. The classification of these pedons also was compared with modern soil taxonomy standards. If the pedon was found to differ significantly in characteristics, a new pedon site was located that had soil properties that were representative of observations made during this soil survey.

Most soils were examined using hand augers and soil tubes. Field notes were taken during the evaluation process. Deeper samples were taken to document soil material to a depth of 80 inches or to bedrock if within 80 inches. These samples were obtained by taking soil cores using a probe truck or using a hand auger with extensions. Pedons described as typical were studied and documented in dug pits. Samples for laboratory analysis were taken at these pits and at other locations in the county to obtain chemical and physical analyses and to determine engineering properties. This information was used in the classification, correlation, and interpretation of specific soil types.

After completion of the fieldwork, map unit delineations were transferred by hand to another set of planimetrically correct photographs. Surface features were recorded from observation of the maps and the landscape.

Samples for chemical and physical analyses were taken from representative sites of several of the soils in the county. The chemical and physical analyses were made by the Soil Characterization Laboratory, School of Natural Resources, The Ohio State University, Columbus, Ohio. The results of the analyses are stored in a computerized data file at the laboratory. The analyses for engineering properties were made by the Ohio Department of Transportation, Division of Highways, Testing Laboratory, Columbus, Ohio. The laboratory procedures can be obtained on request from the respective laboratories. The results of the analyses can be obtained from the School of Natural Resources, The Ohio State University; the Ohio Department of Natural Resources–Division of Soil and Water Conservation; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

General Soil Map Units

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

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

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

Some soil boundaries and soil names in this survey area do not fully match those in adjacent survey areas that were published at an earlier date. Differences are the result of changes and refinements in soil series concepts, updated soil taxonomy, slightly different map unit composition in survey areas, and the use of the State Soil Geographic data (STATSGO) map as the base for the general soil map in this publication.

1. Blount-Pewamo Association

Very deep, level to gently sloping, somewhat poorly drained and very poorly drained soils that formed in till

Setting

Landform: Rises, knolls, flats, depressions, and drainageways on ground moraines and end moraines
Slope range: 0 to 4 percent

Composition

Extent of the association in the county: 55 percent
Extent of the soils in the association:
Blount and similar soils=50 percent
Pewamo and similar soils=34 percent
Minor soils=16 percent

Soil Properties and Qualities

Blount
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises, knolls, and flats
Parent material: Till
Surface textural class: Silt loam or loam
Slope: 0 to 4 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Pewamo
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope: 0 to 2 percent
Permeability: Moderately slow
Available water capacity: High

Minor Soils

The moderately well drained Glynwood soils on knolls and rises
The loamy, moderately well drained Houcktown soils on knolls

Use and Management

Major uses: Cropland, woodland
Management concerns: Seasonal wetness, tilth, compaction, ponding

2. Blount-Glynwood-Pewamo Association (fig. 4)

Very deep, level to strongly sloping, somewhat poorly drained, moderately well drained, and very poorly drained soils that formed in till

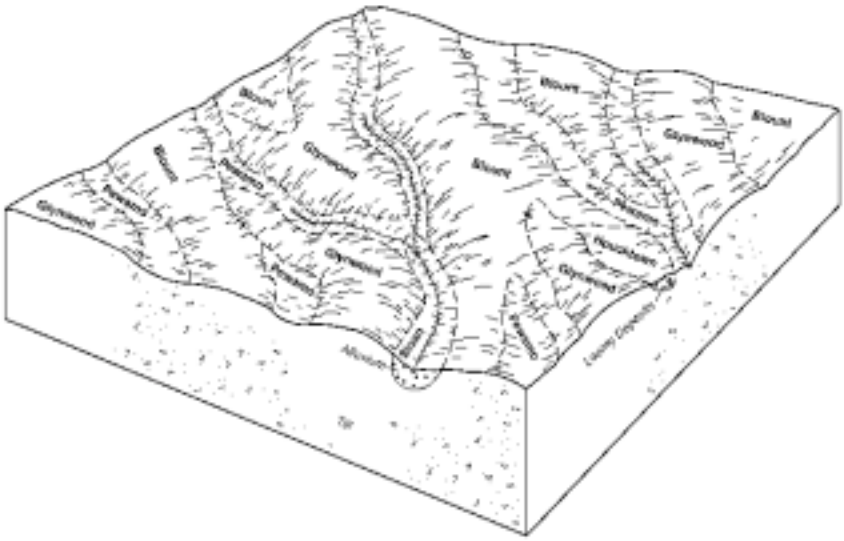

Figure Typical pattern of soils and parent material in the Blount-Glynwood-Pewamo association.

Hancock County, Ohio

Figure 4. Typical pattern of soils and parent material in the Blount-Glynwood-Pewamo association.

Setting

Landform: Rises, knolls, flats, depressions, and drainageways on ground moraines and end moraines
Slope range: 0 to 12 percent

Composition

Extent of the association in the county: 7 percent
Extent of the soils in the association:
Blount and similar soils=45 percent
Glynwood and similar soils=27 percent
Pewamo and similar soils=19 percent
Minor soils=9 percent

Soil Properties and Qualities

Blount
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises, knolls, and flats
Parent material: Till
Surface textural class: Silt loam or loam
Slope: 0 to 4 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Glynwood
Depth class: Very deep
Drainage class: Moderately well drained
Landform: Rises and knolls
Parent material: Till
Surface textural class: Silt loam, silty clay loam or clay loam
Slope: 2 to 12 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Pewamo
Depth class: Very deep

Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope: 0 to 2 percent
Permeability: Moderately slow
Available water capacity: High

Minor Soils

The very poorly drained Sloan soils on flood plains
The loamy, moderately well drained Houcktown soils on knolls and rises

Use and Management

Major uses: Cropland, woodland
Management concerns: Erosion, seasonal wetness, tilth, compaction, ponding

3. Millsdale-Milton-Morley, limestone substratum, Association

Moderately deep and very deep, level to gently sloping, very poorly drained, well drained, and moderately well drained soils that formed in till overlying limestone or dolostone or in till and the underlying residuum from limestone or dolostone

Setting

Landform: Flats, depressions, drainageways, rises, and knolls on ground moraines and on monadnocks on ground moraines
Slope range: 0 to 6 percent

Composition

Extent of the association in the county: 1 percent
Extent of the soils in the association:
Millsdale and similar soils=31 percent
Milton and similar soils=19 percent
Morley, limestone substratum and similar soils=17 percent
Minor soils=33 percent

Soil Properties and Qualities

Millsdale
Depth class: Moderately deep
Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till overlying limestone or dolostone
Surface textural class: Silty clay loam
Slope: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: Low

Milton
Depth class: Moderately deep
Drainage class: Well drained
Landform: Flats, rises, and knolls
Parent material: Till and the underlying residuum from limestone or dolostone
Surface textural class: Silt loam or loam
Slope: 0 to 6 percent
Permeability: Moderately slow
Available water capacity: Low

Morley, limestone substratum
Depth class: Very deep
Drainage class: Moderately well drained
Landform: Knolls and rises
Parent material: Till overlying limestone or dolostone
Surface textural class: Loam
Slope: 0 to 6 percent
Permeability: Moderately slow or slow in the solum and slow or very slow in the till substratum
Available water capacity: Moderate

Minor Soils

The very poorly drained Pewamo soils in depressions and drainageways
Pits, quarry
The somewhat poorly drained Blount soils in areas that are deeper to limestone

Use and Management

Major uses: Cropland, woodland, idle land
Management concerns: Droughtiness, erosion, seasonal wetness, moderately deep root zone, compaction, ponding

4. Hoytville-Nappanee Association (fig. 5)

Very deep, level to gently sloping, very poorly drained and somewhat poorly drained soils that formed in till

Setting

Landform: Flats, depressions, drainageways, rises, knolls, and dissected areas on lake plains
Slope range: 0 to 6 percent

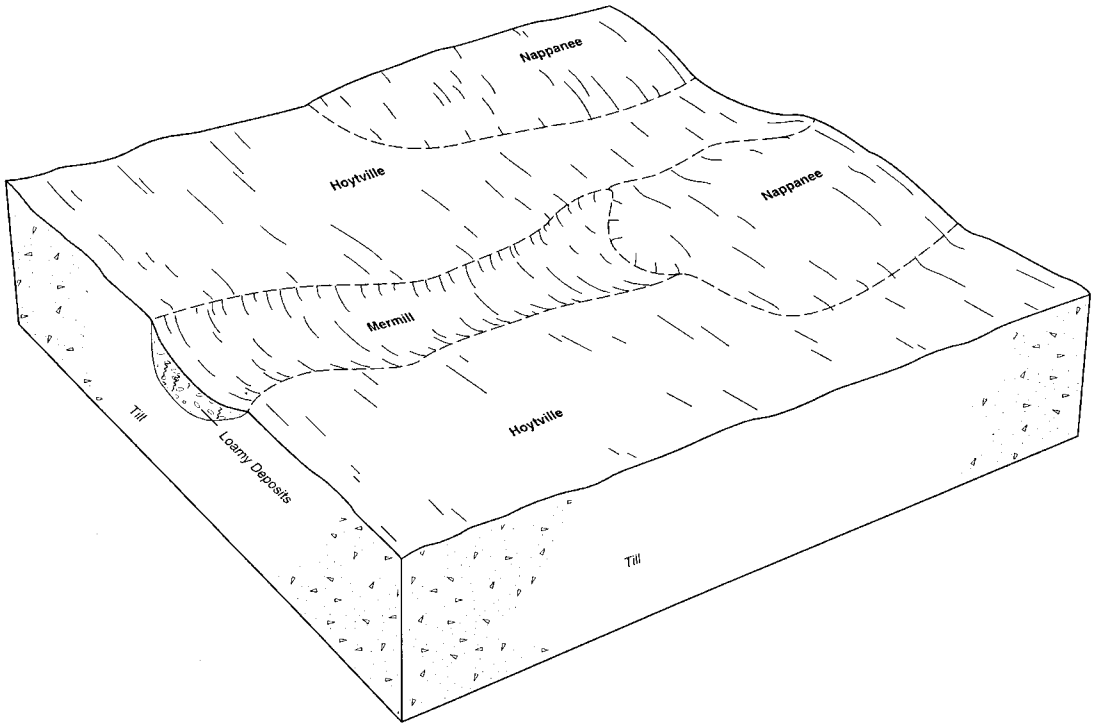

Figure 5. Typical pattern of soils and parent material in the Hoytville-Nappanee association.

Composition

Extent of the association in the county: 11 percent
Extent of the soils in the association:
Hoytville and similar soils=72 percent
Nappanee and similar soils=12 percent
Minor soils=16 percent

Soil Properties and Qualities

Hoytville
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till
Surface textural class: Silty clay or silty clay loam
Slope: 0 to 1 percent
Permeability: Moderately slow in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum
Available water capacity: Moderate

Nappanee
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Flats, rises, and dissected areas
Parent material: Till
Surface textural class: Silty clay loam or loam
Slope: 0 to 6 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Minor Soils

The loamy, somewhat poorly drained, Aurand soils on beach ridges
The loamy, somewhat poorly drained Haskins soils on rises and knolls
The loamy, very poorly drained Mermill soils in depressions and drainageways
The loamy, very poorly drained Sloan soils on flood plains

Use and Management

Major uses: Cropland
Management concerns: Seasonal wetness, high clay content in the surface layer and subsoil, erosion, ponding

5. Pewamo-Vanlue-Tiderishi Association

Very deep, level or nearly level, very poorly drained and somewhat poorly drained soils that formed in till or in glaciolacustrine deposits overlying till

Setting

Landform: Flats, depressions, drainageways, and rises on lake plains
Slope range: 0 to 2 percent

Composition

Extent of the association in the county: 7 percent
Extent of the soils in the association:
Pewamo and similar soils=42 percent
Vanlue and similar soils=18 percent
Tiderishi and similar soils=18 percent
Minor soils=22 percent

Soil Properties and Qualities

Pewamo
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Vanlue
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises
Parent material: Stratified loamy and silty glaciolacustrine deposits overlying till
Surface textural class: Loam
Slope: 0 to 2 percent
Permeability: Moderate in the loamy solum and moderately slow or slow in the lower part of the solum and in the substratum
Available water capacity: High

Tiderishi
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises and flats
Parent material: Stratified loamy glaciolacustrine deposits overlying till
Surface textural class: Loam
Slope: 0 to 2 percent
Permeability: Moderate in the solum and moderately slow or slow in the substratum
Available water capacity: Moderate

Minor Soils

The well drained Rossburg soils on flood plains
The very poorly drained Rensselaer soils on flat areas and in depressions

Use and Management

Major uses: Cropland
Management concerns: Seasonal wetness, compaction, tilth, ponding

6. Pewamo-Blount-Houcktown Association

Very deep, level to gently sloping, very poorly drained, somewhat poorly drained, and moderately well drained soils that formed in till or in loamy deposits and the underlying till

Setting

Landform: Depressions, drainageways, flats, rises, and knolls on end moraines and ground moraines
Slope range: 0 to 6 percent

Composition

Extent of the association in the county: 10 percent
Extent of the soils in the association:
Pewamo and similar soils=28 percent
Blount and similar soils=23 percent
Houcktown and similar soils=20 percent
Minor soils=29 percent

Soil Properties and Qualities

Pewamo
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flats, depressions, and drainageways
Parent material: Till
Surface textural class: Silty clay loam
Slope: 0 to 1 percent
Permeability: Moderately slow
Available water capacity: High

Blount
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises, knolls, and flats
Parent material: Till
Surface textural class: Silt loam or loam
Slope: 0 to 4 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Houcktown
Depth class: Very deep
Drainage class: Moderately well drained
Landform: Rises and knolls
Parent material: Loamy deposits and the underlying till
Surface textural class: Loam
Slope: 0 to 6 percent
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Available water capacity: Moderate

Minor Soils

The loamy, very poorly drained Sloan soils on flood plains
The moderately well drained Glynwood soils on knolls and rises

Use and Management

Major uses: Cropland, woodland
Management concerns: Erosion, seasonal wetness, tilth, compaction, ponding

7. Alvada-Lamberjack-Sloan Association

Very deep, level and nearly level, very poorly drained and somewhat poorly drained soils that formed in: loamy, sandy, or gravelly deposits overlying till; alluvium; or alluvium overlying limestone or dolostone

Setting

Landform: Depressions, drainageways, and rises on outwash plains; flats and backswamps on flood plains
Slope range: 0 to 2 percent

Composition

Extent of the association in the county: 5 percent
Extent of the soils in the association:
Alvada and similar soils=31 percent
Lamberjack and similar soils=29 percent
Sloan and similar soils=13 percent
Minor soils=27 percent

Soil Properties and Qualities

Alvada
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Depressions and drainageways
Parent material: Loamy and gravelly deposits overlying till
Surface textural class: Loam
Slope: 0 to 2 percent
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum, and moderately slow or slow in the substratum
Available water capacity: Moderate

Lamberjack
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises
Parent material: Loamy, sandy, and gravelly outwash overlying till
Surface textural class: Loam
Slope: 0 to 2 percent
Permeability: Moderate in the loamy solum, rapid in the gravelly and sandy substratum, and slow or very slow in the till substratum
Available water capacity: Moderate

Sloan
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Flats and backswamps
Parent material: Alluvium or alluvium overlying limestone or dolostone
Surface textural class: Loam or silty clay loam
Slope: 0 to 1 percent
Permeability: Moderate or moderately slow
Flooding frequency: Occasional
Available water capacity: High

Minor Soils

The very poorly drained Adrian soils in depressions
The well drained Oshtemo soils on backslopes, shoulders, and summits
The well drained Flatrock soils on flood plains

Use and Management

Major uses: Cropland, woodland
Management concerns: Seasonal wetness, compaction, flooding, ponding

8. Pewamo-Del Rey-Blount Association

Very deep, level to gently sloping, somewhat poorly drained and very poorly drained soils that formed in till or glaciolacustrine deposits

Setting

Landform: Depressions, drainageways, rises, knolls, and flats on disintegration moraines
Slope range: 0 to 4 percent

Composition

Extent of the association in the county: 4 percent
Extent of the soils in the association:
Pewamo and similar soils=35 percent
Del Rey and similar soils=22 percent
Blount and similar soils=17 percent
Minor soils=26 percent

Soil Properties and Qualities

Pewamo
Depth class: Very deep
Drainage class: Very poorly drained
Landform: Depressions, drainageways, and flats
Parent material: Till
Surface textural class: Silty clay loam
Slope: 0 to 2 percent
Permeability: Moderately slow
Available water capacity: High

Del Rey
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Flats and rises
Parent material: Glaciolacustrine deposits
Surface textural class: Silt loam
Slope: 0 to 3 percent
Permeability: Slow
Available water capacity: Moderate

Blount
Depth class: Very deep
Drainage class: Somewhat poorly drained
Landform: Rises, knolls, and flats
Parent material: Till
Surface textural class: Silt loam or loam
Slope: 0 to 4 percent
Permeability: Slow in the solum and slow or very slow in the substratum
Available water capacity: Moderate

Minor Soils

The moderately well drained Shinrock soils on higher or more sloping areas
The moderately well drained Glynwood soils on knolls and rises

Use and Management

Major uses: Cropland, woodland
Management concerns: Erosion, seasonal wetness, tilth, compaction, ponding

Detailed Soil Map Units

The map units delineated on the detailed soil maps that accompanies 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, on-site investigation is needed to define and locate the soils and miscellaneous areas.

The detailed map unit descriptions list management statements for most major uses of the soils: cropland, pasture, woodland, building sites, septic tank absorption fields, and local roads and streets. The management statements listed for a particular map unit address the most limiting features of that soil for a certain use.

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, Blount silt loam, 0 to 2 percent slopes is a phase of the Blount series.

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

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. Blount-Jenera complex, 0 to 3 percent slopes is an example.

This survey includes miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Pits, quarry 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.

Figure 6 shows the relationship between different geomorphic slope positions and slope terminology. In areas of low relief in Hancock County, these terms generally are not used. Refer to the Glossary for more detailed definitions of these landform components.

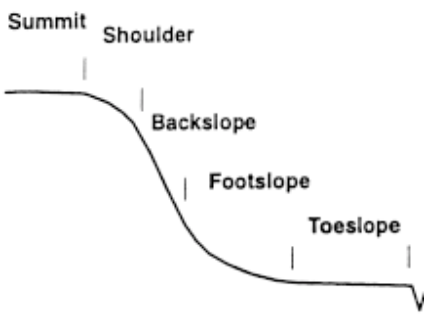

Figure 6. Diagram showing the relationship between slope position and slope terminology. (Adapted from Ruhe, 1975)

AdA—Adrian muck, 0 to 1 percent slopes

Setting
Landform: Depressions on outwash plains
Size of areas: 10 to over 200 acres

Map Unit Composition
Adrian and similar components: 100 percent

Similar components
Limestone bedrock at 60 to 80 inches
More silt and clay in the substratum
Organic deposits less than 16 inches thick
Organic deposits more than 52 inches thick

Soil Properties and Qualities

Available water capacity: About 12.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 125 to 200 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 55.0 to 75.0 percent
Parent material: Herbaceous organic material and the underlying sandy deposits
Permeability: Moderately slow to moderately rapid in the organic material and rapid in the underlying sandy deposits
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Subsidence: 6 to 18 inches initial; 29 to 33 inches total
Surface layer texture: Muck
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- A combination of surface and subsurface drainage helps to remove excess water.
- Subsidence or shrinkage of the muck causes displacement of subsurface drains.
- Control of the water table helps reduce subsidence, prevent burning, and reduce the hazard of wind erosion.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Ponding restricts the safe use of roads by log trucks.
- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- When drained, the organic layers in this soil subside. Subsidence leads to differential rates of settlement which may cause foundations to break. Because of the high potential for subsidence, this soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Subsidence of the organic material reduces the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 4w
Pasture and hayland suitability group: D-1
Prime farmland: Not prime farmland
Hydric soil: Yes

AkA—Alvada loam, 0 to 1 percent slopes

Setting
Landform: Depressions and drainageways on outwash plains, ground moraines, end moraines, and lake plains
Size of areas: 5 to 30 acres

Map Unit Composition
Alvada and similar components: 80 percent

Similar components
Surface layer less than 10 inches thick
Till at 60 to 80 inches
Clay loam surface layer

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Lamberjack soils on rises: 5 percent
Somewhat poorly drained soils on rises: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Loamy and gravelly deposits overlying till
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum, and moderately slow or slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Ponding restricts the safe use of roads by log trucks.
- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

AmA—Alvada-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Depressions and drainageways on outwash plains
Size of areas: 5 to 50 acres

Map Unit Composition
Alvada and similar components: 50 percent
Urban land and similar components: 25 percent

Similar components
Till below 60 inches
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 15 percent
Aurand soils on rises and knolls: 5 percent
Aquents or Udorthents adjacent to buildings and streets: 3 percent
Lamberjack soils on rises and knolls: 2 percent

Soil Properties and Qualities

Alvada
Available water capacity: About 8.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Loamy and gravelly deposits overlying till
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum, and moderately slow or slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Alvada - Yes; Urban land – Unranked

AnA—Aquents, clayey, 0 to 1 percent slopes

Setting
Landform: Borrow pits on ground moraines
Size of areas: 20 to over 200 acres

Map Unit Composition
Aquents and similar components: 90 percent

Similar components
Pewamo
Areas that are ponded for very long periods
Areas with calcareous surface layer

Contrasting Components
Blount soils on rises: 8 percent
Areas with a layer of organic material less than 2 inches thick on similar landform positions: 2 percent

Soil Properties and Qualities

General description: Former borrow pits for clay that have been modified extensively by cutting, filling, and leveling. They are in areas where soil material was excavated to manufacture ceramic tile.
Available water capacity: About 5.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Long
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Yes

ApB—Arkport loamy fine sand, 2 to 6 percent slopes

Setting
Landform: Dunes, beach ridges
Position on the landform: Shoulders, summits, backslopes
Size of areas: 5 to 50 acres

Map Unit Composition
Arkport and similar components: 90 percent

Similar components
Till at 60 to 80 inches
Water table at 3 to 6 feet
More gravel and less sand in the substratum

Contrasting Components
Somewhat poorly drained soils at the base of slopes: 10 percent

Soil Properties and Qualities

Available water capacity: About 5.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3 to 13 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Sandy eolian deposits
Permeability: Moderately rapid
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Very low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- This soil is well suited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: B-1
Prime farmland: All areas are prime farmland
Hydric soil: No

ArA—Aurand loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on beach ridges and lake plains
Position on the landform: Footslopes on beach ridges; summits on lake plains
Size of areas: 5 to 50 acres

Map Unit Composition
Aurand and similar components: 90 percent

Similar components
Lighter colored surface layer
Till at 40 to 60 inches
Moderately well drained soils
Dark colored surface layer less than 10 inches thick
More clay and less sand in the subsoil

Contrasting Components
Mermill soils in depressions and drainageways: 6 percent
Alvada soils in depressions and drainageways: 3 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 1 percent

Soil Properties and Qualities

Available water capacity: About 6.4 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 8 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

AsA—Aurand-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits
Size of areas: 10 to 50 acres

Map Unit Composition
Aurand and similar components: 50 percent
Urban land and similar components: 35 percent

Similar components
Dark colored surface layer less than 10 inches thick
Lighter colored surface layer
Moderately well drained soils
More clay and less sand in the subsoil

Till at 40 to 60 inches

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 5 percent
Mermill soils in depressions and drainageways: 4 percent
Pewamo soils in depressions and drainageways: 3 percent
Udorthents adjacent to buildings and streets: 3 percent

Soil Properties and Qualities

Aurand
Available water capacity: About 6.6 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 8 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Aurand-No; Urban land-Unranked

BgA—Biglick-Milton complex, 0 to 2 percent slopes

Setting
Landform: Flats and rises on monadnocks on ground moraines
Position on the landform: Shoulders, summits
Size of areas: 5 to 20 acres

Map Unit Composition
Biglick and similar components: 70 percent
Milton and similar components: 25 percent

Similar components
Less clay in the subsoil
Silt loam surface layer
Darker colored surface layer

Contrasting Components
Bedrock at 4 to 10 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Biglick
Available water capacity: About 2.5 inches to a depth of 14 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Shallow
Depth to root restrictive feature: Bedrock (lithic): 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 1.2 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent

Parent material: Thin layer of drift over clayey residuum from limestone or dolostone
Permeability: Moderately slow or slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Milton
Available water capacity: About 4.1 inches to a depth of 24 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till and the underlying residuum from limestone or dolostone
Permeability: Moderately slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3s
Pasture and hayland suitability group: Biglick-E-1; Milton-F-1
Prime farmland: Not prime farmland
Hydric soil: Biglick-No; Milton-No

BgB—Biglick-Milton complex, 2 to 6 percent slopes

Setting
Landform: Knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Biglick and similar components: 55 percent
Milton and similar components: 40 percent

Similar components
Less clay in the subsoil
Silt loam surface layer
Darker colored surface layer

Contrasting Components
Bedrock at 4 to 10 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Biglick
Available water capacity: About 2.3 inches to a depth of 13 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Shallow
Depth to root restrictive feature: Bedrock (lithic): 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 1.1 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Thin layer of drift over clayey residuum from limestone or dolostone
Permeability: Moderately slow or slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Milton

Available water capacity: About 4.3 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.2 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till and the underlying residuum from limestone or dolostone
Permeability: Moderately slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: Biglick - E-1; Milton - F-1
Prime farmland: Not prime farmland
Hydric soil: Biglick-No; Milton-No

BnA—Blount loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on end moraines and ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Blount and similar components: 90 percent

Similar components
Poorly drained soils
Moderately well drained soils
More sand and less clay in the subsoil
Silt loam or silty clay loam surface layer

Contrasting Components
Pewamo soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 8.6 inches to a depth of 56 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

BoA—Blount silt loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on end moraines and ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 150 acres

Map Unit Composition
Blount and similar components: 90 percent

Similar components

Poorly drained soils
Less clay in the substratum
Loam or silty clay loam surface layer
More sand and less clay in the subsoil
Slopes of 2 to 4 percent
Moderately well drained soils
Soils formed in glaciolacustrine sediments

Contrasting Components:
Pewamo soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 7.7 inches to a depth of 55 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table (fig. 7).
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Figure 7. Installation of subsurface drainage on Blount silt loam, 0 to 2 percent slopes.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

BoB—Blount silt loam, 2 to 4 percent slopes

Setting
Landform: Knolls on end moraines and ground moraines
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 100 acres

Map Unit Composition
Blount and similar components: 95 percent

Similar components
More sand and less clay in the subsoil and substratum
Slopes of 0 to 2 percent
Eroded silty clay loam surface layer
Moderately well drained soils on 6 to 8 percent slopes

Contrasting Components
Pewamo soils in drainageways: 4 percent
Moderately well drained soils on 8 to 12 percent slopes: 1 percent

Soil Properties and Qualities

Available water capacity: About 6.9 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion (fig. 8).
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Figure 8. Grassed waterways are effective in slowing concentrated runoff and reducing the potential for erosion on Blount silt loam, 2 to 4 percent slopes.

Pastureland

- Erosion control is needed when pastures are renovated.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

BpA—Blount-Houcktown complex, 0 to 3 percent slopes

Setting
Landform: Rises on ground moraines, disintegration moraines, and end moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 35 acres

Map Unit Composition
Blount and similar components: 60 percent
Houcktown and similar components: 35 percent

Similar components
Silt loam surface layer
Loamy soils with till at 40 to 60 inches
Fine sandy loam surface layer
More sand and less clay in the subsoil and substratum

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Blount
Available water capacity: About 6.8 inches to a depth of 43 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.

- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Houcktown

Available water capacity: About 6.4 inches to a depth of 52 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 35 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy water-sorted deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: Blount-C-1; Houcktown-A-6
Prime farmland: Prime farmland if drained
Hydric soil: Blount-No; Houcktown-No

BrA—Blount-Jenera complex, 0 to 3 percent slopes

Setting
Landform: Rises on ground moraines and disintegration moraines
Position on the landform: Shoulders, summits
Size of areas: 3 to 20 acres

Map Unit Composition
Blount and similar components: 55 percent
Jenera and similar components: 40 percent

Similar components
Silt loam surface layer
Loamy somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Blount
Available water capacity: About 7.6 inches to a depth of 52 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Jenera

Available water capacity: About 6.8 inches to a depth of 44 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the subsoil, moderately slow in the middle part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: Blount-C-1; Jenera-A-6
Prime farmland: Prime farmland if drained
Hydric soil: Blount-No; Jenera-No

BuA—Blount-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Rises and flats on ground moraines and end moraines
Position on the landform: Shoulders, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Blount and similar components: 50 percent
Urban land and similar components: 40 percent

Similar components
Till below 40 inches
More sand and less clay in the subsoil and substratum
Moderately well drained soils
Loam surface layer

Contrasting Components
Pewamo soils in depressions and drainageways: 6 percent
Udorthents, loamy adjacent to buildings and streets: 4 percent

Soil Properties and Qualities

Blount
Available water capacity: About 6.6 inches to a depth of 42 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Blount-No; Urban land-Unranked

ChC—Channahon-Biglick complex, 6 to 12 percent slopes

Setting
Landform: Knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders
Size of areas: 50 to 100 acres

Map Unit Composition
Channahon and similar components: 55 percent
Biglick and similar components: 40 percent

Similar components
Silt loam or silty clay loam surface layer
Bedrock at 20 to 40 inches

Contrasting Components
Outcrops of limestone bedrock on similar landform positions: 3 percent
Bedrock at 4 to 10 inches on similar landform positions: 2 percent

Soil Properties and Qualities

Channahon
Available water capacity: About 2.5 inches to a depth of 13 inches
Cation-exchange capacity of the surface layer: 12 to 24 meq per 100 grams
Depth class: Shallow
Depth to root restrictive feature: Bedrock (lithic): 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 1.1 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Loamy drift over limestone or dolostone
Permeability: Moderate
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Soil Properties and Qualities

Biglick
Available water capacity: About 2.1 inches to a depth of 12 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Shallow
Depth to root restrictive feature: Bedrock (lithic): 10 to 20 inches
Depth to the top of the seasonal high water table: Greater than 1.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Thin layer of drift over clayey residuum from limestone or dolostone
Permeability: Moderately slow or slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of the limited depth to hard bedrock, excavation is difficult.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 4e
Pasture and hayland suitability group: Channahon-E-1; Biglick-E-1
Prime farmland: Not prime farmland
Hydric soil: Channahon-No; Biglick-No

CoA—Colwood loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on lake plains
Size of areas: 5 to 30 acres

Map Unit Composition
Colwood and similar components: 80 percent

Similar components
Till at 60 to 80 inches
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick
More rock fragments in the subsoil and substratum

Contrasting Components
Darroch soils on rises: 10 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent

Soil Properties and Qualities

Available water capacity: About 12.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Very brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 8.0 percent
Parent material: Stratified glaciolacustrine deposits
Permeability: Moderate or moderately slow in the solum and moderate in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

CtA—Cygnet loam, 0 to 2 percent slopes

Setting
Landform: Rises on longshore bars and beach ridges on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 75 acres

Map Unit Composition
Cygnet and similar components: 90 percent

Similar components
Till below 60 inches
Fine sandy loam surface layer
More sand and less clay in the subsoil
More rock fragments in the upper part of the substratum
Somewhat poorly drained soils with till at 20 to 40 inches
Well drained soils

Contrasting Components
Alvada soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 8.4 inches to a depth of 53 inches
Cation-exchange capacity of the surface layer: 7 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum and in the upper part of the substratum, and slow or very slow in the lower part of the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

CuA—Cygnet-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Rises on beach ridges and longshore bars on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 30 acres

Map Unit Composition
Cygnet and similar components: 50 percent
Urban land and similar components: 40 percent

Similar components
Fine sandy loam surface layer
More sand and less clay in the subsoil
More rock fragments in the upper part of the substratum
Somewhat poorly drained soils with till at 20 to 40 inches
Darker colored surface layer

Contrasting Components
Alvada soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Cygnet
Available water capacity: About 9.1 inches to a depth of 57 inches
Cation-exchange capacity of the surface layer: 7 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum and in the upper part of the substratum, and slow or very slow in the lower part of the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Cygnet-No; Urban land-Unranked

DbA—Darroch loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on lake plains and outwash plains
Position on the landform: Summits
Size of areas: 5 to 50 acres

Map Unit Composition
Darroch and similar components: 90 percent

Similar components
Surface layer less than 10 inches thick
Lighter colored surface layer
Moderately well drained soils with a lighter colored surface layer
Till at 60 to 80 inches

Contrasting Components
Colwood soils in depressions and drainageways: 8 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Available water capacity: About 10.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Stratified loamy and silty deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

DeA—Del Rey silt loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 30 acres

Map Unit Composition
Del Rey and similar components: 85 percent

Similar components
Silty clay loam surface layer
More clay in the lower subsoil and substratum
Moderately well drained soils

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Patton soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

DfA—Del Rey-Blount complex, 0 to 3 percent slopes

Setting
Landform: Flats and rises on disintegration moraines
Position on the landform: Summits, shoulders
Size of areas: 3 to 20 acres

Map Unit Composition
Del Rey and similar components: 55 percent
Blount and similar components: 40 percent

Similar components
More clay in the substratum
More sand and less clay in the subsoil
Moderately well drained soils
Loam surface layer

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Del Rey
Available water capacity: About 9.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Blount
Available water capacity: About 6.7 inches to a depth of 44 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: Del Rey-C-1; Blount-C-1
Prime farmland: Prime farmland if drained
Hydric soil: Del Rey-No; Blount-No

DuB—Dunbridge loamy fine sand, 1 to 4 percent slopes

Setting
Landform: Rises and knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 3 to 15 acres

Map Unit Composition
Dunbridge and similar components: 100 percent

Similar components
Moderately well drained sandy soils with bedrock at 40 to 60 inches
More sand and less clay in the subsoil
Fine sandy loam surface layer
Bedrock at 40 to 60 inches
Lighter colored surface layer

Soil Properties and Qualities

Available water capacity: About 3.4 inches to a depth of 25 inches
Cation-exchange capacity of the surface layer: 6 to 13 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.1 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Loamy drift overlying limestone or dolostone
Permeability: Moderately rapid
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: High
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Rock fragments obstruct the use of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3s
Pasture and hayland suitability group: F-1
Prime farmland: All areas are prime farmland
Hydric soil: No

EmA—Elliott silt loam, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits
Size of areas: 5 to 50 acres

Map Unit Composition
Elliott and similar components: 90 percent

Similar components
Silty clay loam or loam surface layer
Thicker subsoil
Lighter colored surface layer
More sand and less clay in the subsoil

Contrasting Components
Pewamo soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 6.6 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 18 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 32 to 55 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Till
Permeability: Moderately slow in the upper part of the solum and slow or moderately slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site

development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

FbA—Flatrock loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Rises on flood plains
Size of areas: 5 to 20 acres

Map Unit Composition
Flatrock and similar components: 95 percent

Similar components
Somewhat poorly drained soils
Silt loam surface layer
Well drained soils
Darker colored surface layer
Till at 60 to 80 inches

Contrasting Components
Sloan soils in backswamps: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Very brief
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

FcA—Flatrock silt loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Natural levees, rises, and flats on flood plains
Size of areas: 5 to over 200 acres

Map Unit Composition
Flatrock and similar components: 90 percent

Similar components
Darker colored surface layer
Loam surface layer
Somewhat poorly drained soils
Till at 60 to 80 inches
Well drained soils

Contrasting Components
Sloan soils in backswamps: 10 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Brief
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.

- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

FdA—Flatrock silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Natural levees, rises, and flats on flood plains
Size of areas: 5 to 75 acres

Map Unit Composition
Flatrock, limestone substratum and similar components: 95 percent

Similar components
Darker colored surface layer
Loam surface layer
Somewhat poorly drained soils
Bedrock at 40 to 60 inches
Well drained soils
Bedrock at 80 to 120 inches

Contrasting Components
Sloan soils in backswamps: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Bedrock (lithic): 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Brief
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium overlying limestone or dolostone
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.

- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

FoA—Fox loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on beach ridges on lake plains and on outwash plains and moraines
Position on the landform: Shoulders, summits
Size of areas: 5 to 20 acres

Map Unit Composition
Fox and similar components: 90 percent

Similar components
Sandy loam surface layer
Thicker subsoil
Less clay and more sand in the subsoil
Slopes of 2 to 6 percent
Till at 60 to 80 inches

Contrasting Components
Somewhat poorly drained soils on footslopes: 10 percent

Soil Properties and Qualities

Available water capacity: About 5.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy deposits or beach deposits overlying stratified sandy and gravelly material
Permeability: Moderate in the solum and rapid or very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability in the lower part of this soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2s
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

FoB—Fox loam, 2 to 6 percent slopes

Setting
Landform: Knolls on beach ridges on lake plains and on outwash plains and moraines
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 75 acres

Map Unit Composition
Fox and similar components: 90 percent

Similar components
Less clay and more sand in the subsoil
Sandy loam surface layer
Thicker subsoil
Till at 60 to 80 inches

Contrasting Components
Somewhat poorly drained soils at the base of slopes and in depressions: 7 percent
Vaughnsville soils on footslopes: 3 percent

Soil Properties and Qualities

Available water capacity: About 6.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy deposits or beach deposits overlying stratified sandy and gravelly material
Permeability: Moderate in the solum and rapid or very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability in the lower part of this soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

FoC2—Fox loam, 6 to 12 percent slopes, eroded

Setting
Landform: Knolls on beach ridges on lake plains and on outwash plains
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Fox and similar components: 100 percent

Similar components
Less clay and more sand in the subsoil
Sandy loam surface layer
Thicker subsoil
Till at 60 to 80 inches

Soil Properties and Qualities

Available water capacity: About 6.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 16 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Loamy deposits or beach deposits overlying stratified sandy and gravelly material
Permeability: Moderate in the solum and rapid or very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments obstruct the use of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability in the lower part of this soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-1
Prime farmland: Not prime farmland
Hydric soil: No

FsA—Fulton silt loam, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Shoulders, summits
Size of areas: 5 to 30 acres

Map Unit Composition
Fulton and similar components: 80 percent

Similar components
Poorly drained soils
Silty clay loam surface layer
Less clay in the substratum
More sand and less clay in the subsoil

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Toledo soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 7.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate

Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-2
Prime farmland: Prime farmland if drained
Hydric soil: No

FtA—Fulton silt loam, till substratum, 0 to 2 percent slopes

Setting
Landform: Rises on disintegration moraines
Position on the landform: Shoulders, summits
Size of areas: 2 to 35 acres

Map Unit Composition
Fulton, till substratum and similar components: 95 percent

Similar components
Poorly drained soils
Till at more than 80 inches
Moderately well drained soils
Silty clay loam surface layer
Less clay in the substratum
Till at less than 60 inches

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 7.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Glaciolacustrine deposits overlying till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-2
Prime farmland: Prime farmland if drained
Hydric soil: No

GaB—Gallman loam, 2 to 6 percent slopes

Setting
Landform: Knolls on outwash areas on end moraines and ground moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 30 acres

Map Unit Composition
Gallman and similar components: 90 percent

Similar components
Sandy loam or fine sandy loam surface layer
Till at 60 to 80 inches
Less clay and more sand in the subsoil

Contrasting Components
Somewhat poorly drained soils at the base of slopes and in seep areas: 10 percent

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Poorly sorted outwash
Permeability: Moderately rapid in the solum, and moderately rapid or rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

GfA—Gilford mucky loam, 0 to 1 percent slopes

Setting
Landform: Flats and depressions on outwash plains
Size of areas: 5 to 30 acres

Map Unit Composition
Gilford and similar components: 90 percent

Similar components
Dark colored surface layer less than 10 inches thick
Thicker solum with more clay and less sand
Fine sandy loam surface layer
More rock fragments in the substratum

Contrasting Components
Somewhat poorly drained soils on rises: 7 percent
Ottokee soils on rises: 3 percent

Soil Properties and Qualities
Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 24 to 52 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Very brief
Depth of ponding: 0.0 to 0.5 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 10.0 to 20.0 percent
Parent material: Loamy and sandy deposits
Permeability: Moderately rapid in the upper part of the solum and rapid in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Mucky loam
Potential for surface runoff: Negligible
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

GmA—Glynwood loam, limestone substratum, 0 to 2 percent slopes

Setting
Landform: Rises on monadnocks on ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 30 acres

Map Unit Composition
Glynwood, limestone substratum and similar components: 100 percent

Similar components
Somewhat poorly drained soils
Well drained soils
More sand and less clay in the subsoil
Bedrock at 40 to 60 inches
Silt loam surface layer

Soil Properties and Qualities

Available water capacity: About 6.5 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches; bedrock (lithic): 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched

Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till overlying limestone or dolostone
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups
Land capability classification: 1
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

GnB—Glynwood silt loam, 2 to 6 percent slopes

Setting
Landform: Dissected areas and knolls on end moraines and ground moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Glynwood and similar components: 95 percent

Similar components
Eroded areas with clay loam or silty clay loam surface layer
Loam surface layer
More sand and less clay in the subsoil and substratum
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 7.5 inches to a depth of 47 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

GpB2—Glynwood silty clay loam, 2 to 6 percent slopes, eroded

Setting
Landform: Dissected areas and knolls on ground moraines and end moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Glynwood and similar components: 90 percent

Similar components
Uneroded areas with silt loam surface layer
Slopes of 6 to 12 percent
More sand and less clay in the subsoil and substratum
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent
Severely eroded areas with carbonates at less than 16 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.3 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site

development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

GpC2—Glynwood silty clay loam, 6 to 12 percent slopes, eroded

Setting
Landform: Dissected areas and knolls on ground moraines and end moraines
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 40 acres

Map Unit Composition
Glynwood and similar components: 90 percent

Similar components
Slopes of 12 to 18 percent
More sand and less clay in the subsoil and substratum
Somewhat poorly drained soils
Loam or silt loam surface layer

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent
Severely eroded areas with carbonates at less than 16 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.3 inches to a depth of 41 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.

- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 4e
Pasture and hayland suitability group: A-6
Prime farmland: Not prime farmland
Hydric soil: No

GsB—Glynwood-Blount-Houcktown complex, 1 to 4 percent slopes

Setting
Landform: Knolls on disintegration moraines
Position on the landform: Backslopes, summits, shoulders
Size of areas: 3 to 50 acres

Map Unit Composition
Glynwood and similar components: 40 percent
Blount and similar components: 35 percent
Houcktown and similar components: 15 percent

Similar components
Silt loam surface layer
Fine sandy loam surface layer
Till at 40 to 80 inches

Contrasting Components
Pewamo soils in depressions and drainageways: 7 percent
Sandy, moderately well drained soils on the crests of knolls: 3 percent

Soil Properties and Qualities

Glynwood
Available water capacity: About 7.2 inches to a depth of 47 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet

Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Blount
Available water capacity: About 6.9 inches to a depth of 44 inches
Cation-exchange capacity of the surface layer: 13 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 30 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None

Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Houcktown
Available water capacity: About 6.4 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 35 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy water-sorted deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium

Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: Glynwood-A-6; Blount-C-1; Houcktown-A-6
Prime farmland: All areas are prime farmland
Hydric soil: Glynwood–No; Blount–No; Houcktown–No

GuB—Glynwood-Urban land complex, 2 to 6 percent slopes

Setting
Landform: Knolls and dissected areas on ground moraines and end moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 3 to over 200 acres

Map Unit Composition
Glynwood and similar components: 55 percent
Urban land and similar components: 35 percent

Similar components
Loam surface layer
Till at 40 to 60 inches
More sand and less clay in the subsoil
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 7 percent
Udorthents, loamy adjacent to buildings and streets: 3 percent

Soil Properties and Qualities

Glynwood
Available water capacity: About 7.8 inches to a depth of 49 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum

Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Glynwood-No; Urban land-Unranked

HaA—Harrod silt loam, 0 to 1 percent slopes, frequently flooded

Setting
Landform: Natural levees and flats on flood plains
Size of areas: 5 to 20 acres

Map Unit Composition
Harrod and similar components: 90 percent

Similar components
Lighter colored surface layer
Bedrock at 40 to 60 inches
Well drained soils
Loam surface layer

Contrasting Components
Poorly drained and very poorly drained soils in backswamps: 10 percent

Soil Properties and Qualities

Available water capacity: About 6.0 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium overlying limestone or dolostone
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- The root system of winter grain crops may be damaged by frost action.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Winter grain crops are commonly not grown because of frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Subsurface drainage helps to lower the seasonal high water table.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: F-1
Prime farmland: Prime farmland if protected from flooding or not frequently flooded during the growing season
Hydric soil: No

HkA—Haskins fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Shoulders, summits
Size of areas: 3 to 20 acres

Map Unit Composition
Haskins and similar components: 95 percent

Similar components
Darker colored surface layer
Till at 40 to 60 inches
Moderately well drained soils
More clay and less sand in the subsoil
Loam surface layer

Contrasting Components
Mermill soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.6 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 5 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained

Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, and slow or very slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: High
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

HnA—Haskins loam, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Shoulders, summits
Size of areas: 5 to 25 acres

Map Unit Composition
Haskins and similar components: 95 percent

Similar components
Darker colored surface layer
Fine sandy loam or sandy loam surface layer
Moderately well drained soils
More clay and less sand in the subsoil
Till at 40 to 60 inches

Contrasting Components
Mermill soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.9 inches to a depth of 52 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet

Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, and slow or very slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

HpA—Houcktown loam, 0 to 2 percent slopes

Setting
Landform: Rises on end moraines, ground moraines, and lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 20 acres

Map Unit Composition
Houcktown and similar components: 95 percent

Similar components
Darker colored surface layer
Fine sandy loam or sandy loam surface layer
Somewhat poorly drained soils
More clay and less sand in the subsoil
Till at 40 to 60 inches

Contrasting Components
Pewamo soils in depressions: 4 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 1 percent

Soil Properties and Qualities

Available water capacity: About 6.6 inches to a depth of 51 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams

Depth class: Very deep
Depth to root restrictive feature: Dense material: 35 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy water-sorted deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

HpB—Houcktown loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains, ground moraines, and end moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 35 acres

Map Unit Composition
Houcktown and similar components: 90 percent

Similar components
Fine sandy loam or sandy loam surface layer
Till at 40 to 60 inches
More clay and less sand in the subsoil
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 6 percent
Mermill soils in depressions and drainageways: 3 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 1 percent

Soil Properties and Qualities

Available water capacity: About 6.4 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 35 to 60 inches

Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy water-sorted deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

HrB—Houcktown-Glynwood-Jenera complex, 1 to 4 percent slopes

Setting
Landform: Knolls on disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 3 to 20 acres

Map Unit Composition
Houcktown and similar components: 40 percent
Glynwood and similar components: 30 percent
Jenera and similar components: 25 percent

Similar components
Sandy, moderately well drained soils
Till at 60 to 80 inches
Silt loam surface layer
Loamy fine sand surface layer
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Houcktown
Available water capacity: About 5.4 inches to a depth of 45 inches

Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 35 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy water-sorted deposits and the underlying till
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Glynwood
Available water capacity: About 7.2 inches to a depth of 47 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None

Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Jenera
Available water capacity: About 9.3 inches to a depth of 58 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None

Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Permeability: Moderate in the loamy solum, moderately slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: Houcktown-A-6; Glynwood-A-6; Jenera-A-6
Prime farmland: All areas are prime farmland
Hydric soil: Houcktown-No; Glynwood-No; Jenera-No

HsA—Hoytville silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on lake plains
Size of areas: 25 to 100 acres

Map Unit Composition
Hoytville and similar components: 95 percent

Similar components
More sand and less clay in the subsoil
Dark colored surface layer more than 10 inches thick
Lighter colored surface layer
Silty clay or clay surface layer

Contrasting Components
Nappanee soils on rises: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 35 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 65 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Till

Permeability: Moderately slow in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

HtA—Hoytville silty clay, 0 to 1 percent slopes (fig. 9)

Setting
Landform: Flats, depressions, and drainageways on lake plains
Size of areas: Most areas are over a 1,000 acres; a few areas are 10 to 100 acres

Map Unit Composition
Hoytville and similar components: 95 percent

Similar components
Silty clay loam or clay surface layer
Lighter colored surface layer
Thicker subsoil
Dark colored surface layer more than 10 inches thick

Contrasting Components
Nappanee soils on rises: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 24 to 40 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 65 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Till
Permeability: Moderately slow in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Figure 9. Grass filter strips between cropland and open ditches help reduce sediment in ditches on Hoytville silty clay, 0 to 1 percent slopes.

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration (fig. 10).
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Figure 10. Conservation tillage on Hoytville silty clay, 0 to 1 percent slopes. Conservation tillage and the incorporation of plant residue into the soil surface help reduce clodding, improve soil structure, and increase organic matter content.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- Burning may destroy organic matter.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

JeA—Jenera fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Rises on ground moraines and lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 45 acres

Map Unit Composition
Jenera and similar components: 85 percent

Similar components
More sand and less clay in the subsoil
Loam or loamy fine sand surface layer
Till at 60 to 80 inches
Darker colored surface layer
Somewhat poorly drained soils

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Very poorly drained soils in depressions: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Permeability: Moderate in the loamy solum, and slow or moderately slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

JeB—Jenera fine sandy loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains and ground moraines
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 20 acres

Map Unit Composition
Jenera and similar components: 95 percent

Similar components
Loam or loamy fine sand surface layer
More sand and less clay in the subsoil
Somewhat poorly drained soils
Till at 60 to 80 inches
Darker colored surface layer

Contrasting Components
Poorly drained soils in depressions: 4 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 1 percent

Soil Properties and Qualities

Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Permeability: Moderate in the loamy solum, and slow or moderately slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

JfB—Jenera-Shinrock, till substratum complex, 1 to 4 percent slopes

Setting
Landform: Knolls on disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 3 to 20 acres

Map Unit Composition
Jenera and similar components: 55 percent
Shinrock, till substratum and similar components: 35 percent

Similar components
Somewhat poorly drained soils
Till at 20 to 40 inches
More sand and less clay in the subsoil
Loam or loamy fine sand surface layer
Eroded areas with silty clay loam surface layer

Contrasting Components
Pewamo soils in depressions and drainageways: 7 percent
Rimer soils on knolls: 3 percent

Soil Properties and Qualities

Jenera
Available water capacity: About 7.8 inches to a depth of 59 inches
Cation-exchange capacity of the surface layer: 6 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the subsoil, moderately slow in the lower part of the subsoil and the upper part of the substratum, and slow or very slow in the lower part of the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Shinrock, till substratum
Available water capacity: About 8.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits overlying till
Permeability: Moderately slow in the upper part of the solum, moderate or moderately slow in the lower part of the solum, and slow or very slow in the till
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: Jenera-A-6; Shinrock, till substratum-A-6
Prime farmland: All areas are prime farmland
Hydric soil: Jenera-No; Shinrock, till substratum-No

JoA—Joliet loam, 0 to 1 percent slopes

Setting
Landform: Depressions, drainageways, and flats on ground moraines and stream terraces
Size of areas: 3 to 15 acres

Map Unit Composition
Joliet and similar components: 95 percent

Similar components
Randolph
Silty clay loam or clay loam surface layer
Less clay in the subsoil
Dark colored surface layer less than 10 inches thick

Contrasting Components
Very poorly drained soils with bedrock at 40 to 60 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 7.6 inches to a depth of 18 inches
Cation-exchange capacity of the surface layer: 18 to 26 meq per 100 grams
Depth class: Shallow
Depth to root restrictive feature: Bedrock (lithic): 10 to 20 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 5.0 percent
Parent material: Loamy drift overlying limestone or dolostone
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Subsurface drainage helps to lower the seasonal high water table.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Rock fragments obstruct the use of mechanical planting equipment.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.
- Because of the seasonal high water table, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Because of the limited depth to hard bedrock, excavation is difficult.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 4w
Pasture and hayland suitability group: E-1
Prime farmland: Not prime farmland
Hydric soil: Yes

KnA—Knoxdale silt loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Natural levees, flats, and rises on flood plains
Size of areas: 10 to 50 acres

Map Unit Composition
Knoxdale and similar components: 90 percent

Similar components
Moderately well drained soils
Till at 60 to 80 inches
Darker colored surface layer
More silt and less sand in the subsoil

Contrasting Components
Sloan soils in backswamps: 5 percent
Somewhat poorly drained soils on flats and in backswamps: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 9 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding duration: Brief
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Alluvium
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

LbA—Lamberjack loam, 0 to 2 percent slopes

Setting
Landform: Rises on outwash plains and in outwash areas on end moraines and ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Lamberjack and similar components: 85 percent

Similar components
Till below 80 inches
Sandy loam surface layer
Darker colored surface layer
Moderately well drained soils

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Alvada soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Loamy, sandy, and gravelly outwash overlying till
Permeability: Moderate in the loamy solum, rapid in the gravelly and sandy substratum, and slow or very slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the middle part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

LcA—Lamberjack-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Rises on outwash plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 200 acres

Map Unit Composition
Lamberjack and similar components: 40 percent
Urban land and similar components: 35 percent

Similar components
Darker colored surface layer
Moderately well drained soils
Till at 40 to 60 inches

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 15 percent
Alvada soils in depressions and drainageways: 5 percent
Udorthents, loamy adjacent to buildings and streets: 5 percent

Soil Properties and Qualities

Lamberjack
Available water capacity: About 8.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Loamy, sandy, and gravelly outwash overlying till
Permeability: Moderate in the loamy solum, rapid in the gravelly and sandy substratum, and slow or very slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the middle part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Lamberjack-No; Urban land-Unranked

LuB2—Lucas silty clay loam, 2 to 6 percent slopes, eroded

Setting
Landform: Knolls on dissected areas on lake plains; a few areas are on disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 15 acres

Map Unit Composition
Lucas and similar components: 95 percent

Similar components
Somewhat poorly drained soils
More sand and less clay in the subsoil
Uneroded areas with silt loam surface layer
Till at 60 to 80 inches

Contrasting Components
Poorly drained soils in drainageways and seep areas: 5 percent

Soil Properties and Qualities

Available water capacity: About 7.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 30 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Slow or very slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

LyE—Lybrand silt loam, 18 to 50 percent slopes

Setting
Landform: Dissected areas on end moraines and ground moraines
Position on the landform: Backslopes
Size of areas: 5 to 25 acres

Map Unit Composition
Lybrand and similar components: 95 percent

Similar components
Eroded areas with silty clay loam or clay loam surface layer
Thinner subsoil
Moderately well drained soils on 12 to 18 percent slopes

Contrasting Components
Blount soils in drainageways and seep areas: 5 percent

Soil Properties and Qualities

Available water capacity: About 7.1 inches to a depth of 47 inches
Cation-exchange capacity of the surface layer: 11 to 24 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 3.3 to 5.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Till
Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- The slope may restrict the use of some farm equipment.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 6e
Pasture and hayland suitability group: A-3
Prime farmland: Not prime farmland
Hydric soil: No

MbA—Medway silt loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Flats and rises on flood plains
Size of areas: 5 to 50 acres

Map Unit Composition
Medway and similar components: 90 percent

Similar components
Loam or silty clay loam surface layer
Dark colored surface layer more than 24 inches thick
Lighter colored surface layer
Less sand and more silt in the subsoil
Well drained soils
Somewhat poorly drained soils

Contrasting Components
Sloan soils in backswamps: 10 percent

Soil Properties and Qualities

Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

McA—Medway silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Flats and rises on flood plains
Size of areas: 10 to 50 acres

Map Unit Composition
Medway, limestone substratum and similar components: 90 percent

Similar components
Dark colored surface layer less than 10 inches thick
Bedrock at 40 to 60 inches
Dark colored surface layer more than 24 inches thick
Well drained soils
Somewhat poorly drained soils
Bedrock at 80 to 120 inches

Contrasting Components
Sloan soils in backswamps: 10 percent

Soil Properties and Qualities

Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Bedrock (lithic): 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium overlying limestone or dolostone
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

MeA—Mermill loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on lake plains
Size of areas: 10 to 75 acres

Map Unit Composition
Mermill and similar components: 90 percent

Similar components
Till at 40 to 60 inches
More clay and less sand in the subsoil
Surface layer more than 10 inches thick
Clay loam or silty clay loam surface layer

Contrasting Components
Aurand soils on rises: 7 percent
Haskins soils on rises: 3 percent

Soil Properties and Qualities

Available water capacity: About 7.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum and slow or very slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

MfA—Mermill clay loam, 0 to 1 percent slopes

Setting
Landform: Flats, drainageways, and depressions on lake plains
Size of areas: 5 to 50 acres

Map Unit Composition
Mermill and similar components: 90 percent

Similar components
Loam or silty clay loam surface layer
More clay and less sand in the subsoil
Surface layer more than 10 inches thick
Till at 40 to 60 inches

Contrasting Components
Aurand soils on rises: 7 percent
Haskins soils on rises: 3 percent

Soil Properties and Qualities

Available water capacity: About 6.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 31 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum and slow or very slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

MgA—Millsdale silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on ground moraines and lake plains and on monadnocks on ground moraines
Size of areas: 5 to 50 acres

Map Unit Composition
Millsdale and similar components: 90 percent

Similar components
Less clay in the subsoil
Surface layer more than 24 inches thick
Surface layer less than 10 inches thick
Bedrock at 10 to 20 inches
Bedrock at 40 to 60 inches
Silt loam or loam surface layer

Contrasting Components
Randolph soils on rises: 8 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Available water capacity: About 5.7 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: 19 to 35 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 7.0 percent
Parent material: Till overlying limestone or dolostone
Permeability: Moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.
- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-2
Prime farmland: Prime farmland if drained
Hydric soil: Yes

MnA—Milton silt loam, 0 to 2 percent slopes

Setting
Landform: Rises on ground moraines and on monadnocks on ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 75 acres

Map Unit Composition
Milton and similar components: 90 percent

Similar components
Loam surface layer
Moderately well drained soils
More sand and less clay in the subsoil
Bedrock at 40 to 60 inches

Contrasting Components
Morley, limestone substratum soils on similar landform positions: 5 percent
Randolph soils along drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 4.9 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 7 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.4 feet
Ponding: None

Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till and the underlying residuum from limestone or dolostone
Permeability: Moderately slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2s
Pasture and hayland suitability group: F-1
Prime farmland: All areas are prime farmland
Hydric soil: No

MpD3—Morley clay loam, 12 to 18 percent slopes, severely eroded

Setting
Landform: Dissected areas on end moraines and ground moraines
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Morley and similar components: 90 percent

Similar components
Thinner subsoil
Well drained soils
Somewhat poorly drained soils

Contrasting Components
Poorly drained soils in seep areas and along drainageways: 5 percent
Uneroded areas with silt loam or loam surface layer on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 4.9 inches to a depth of 39 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Moderately slow or slow in the solum and slow or very slow in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during construction of haul roads and log landings.
- The slope restricts the use of equipment for preparing this site for planting and seeding.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 6e
Pasture and hayland suitability group: A-1
Prime farmland: Not prime farmland
Hydric soil: No

MrA—Morley loam, limestone substratum, 0 to 2 percent slopes

Setting
Landform: Rises on monadnocks on ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 80 acres

Map Unit Composition
Morley, limestone substratum and similar components: 95 percent

Similar components
Bedrock at 40 to 60 inches
Loam textured substratum
Thicker subsoil
More sand and less clay in the subsoil
Well drained soils
Silt loam surface layer

Contrasting Components
Milton soils on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 11 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches; bedrock (lithic): 60 to 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Till overlying limestone or dolostone
Permeability: Moderately slow or slow in the solum and slow or very slow in the till substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- This soil is well suited to cropland.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent

from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

MsB—Morley, limestone substratum-Milton complex, 2 to 6 percent slopes

Setting
Landform: Knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders
Size of areas: 10 to 75 acres

Map Unit Composition
Morley, limestone substratum and similar components: 60 percent
Milton and similar components: 30 percent

Similar components
Bedrock at 40 to 60 inches
Loam textured substratum
More sand and less clay in the subsoil
Silt loam surface layer
Thicker subsoil
Slopes of 0 to 2 percent

Contrasting Components
Biglick soils along drainageways: 10 percent

Soil Properties and Qualities

Morley, limestone substratum
Available water capacity: About 6.1 inches to a depth of 42 inches
Cation-exchange capacity of the surface layer: 11 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches; bedrock (lithic): 60 to 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Till overlying limestone or dolostone
Permeability: Moderately slow or slow in the solum and slow or very slow in the till substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of proper installation of the effluent distribution lines.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Milton
Available water capacity: About 4.8 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 7 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: Greater than 2.4 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till and the underlying residuum from limestone or dolostone
Permeability: Moderately slow
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: Morley, limestone substratum-A-1; Milton-F-1
Prime farmland: All areas are prime farmland
Hydric soil: Morley, limestone substratum-No; Milton-No

MvB—Mortimer silt loam, 2 to 6 percent slopes

Setting
Landform: Knolls and dissected areas on end moraines
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 35 acres

Map Unit Composition
Mortimer and similar components: 95 percent

Similar components
Eroded areas with silty clay loam surface layer
Soils formed in glaciolacustrine sediments
More sand and less clay in the subsoil
Somewhat poorly drained soils
Slopes of 0 to 2 percent

Contrasting Components
Poorly drained soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 49 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: F-5
Prime farmland: All areas are prime farmland
Hydric soil: No

MwB2—Mortimer silty clay loam, 2 to 6 percent slopes, eroded

Setting
Landform: Knolls and dissected areas on end moraines
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 40 acres

Map Unit Composition
Mortimer and similar components: 95 percent

Similar components
Somewhat poorly drained soils
Till at 40 to 60 inches
Soils formed in glaciolacustrine sediments
More sand and less clay in the subsoil
Uneroded areas with silt loam surface layer
Thinner subsoil

Contrasting Components
Severely eroded areas with carbonates at less than 17 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.2 inches to a depth of 52 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 4e
Pasture and hayland suitability group: F-5
Prime farmland: All areas are prime farmland
Hydric soil: No

NnA—Nappanee loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Nappanee and similar components: 90 percent

Similar components
Poorly drained soils
Moderately well drained soils
More sand and less clay in the subsoil
Clay loam or silt loam surface layer

Contrasting Components
Hoytville soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 6.6 inches to a depth of 56 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till

Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: F-7
Prime farmland: Prime farmland if drained
Hydric soil: No

NnB—Nappanee loam, 2 to 6 percent slopes

Setting
Landform: Dissected areas on lake plains
Position on the landform: Shoulders, backslopes
Size of areas: 3 to 15 acres

Map Unit Composition
Nappanee and similar components: 90 percent

Similar components
Poorly drained soils
More sand and less clay in the subsoil
Moderately well drained soils
Silt loam surface layer
Eroded areas with clay loam surface layer

Contrasting Components
Hoytville soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 5.6 inches to a depth of 46 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- The rooting depth of crops may be restricted by the high clay content.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: F-7
Prime farmland: Prime farmland if drained
Hydric soil: No

NpA—Nappanee silty clay loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 50 acres

Map Unit Composition
Nappanee and similar components: 90 percent

Similar components
Poorly drained soils
Moderately well drained soils
More sand and less clay in the subsoil
Silt loam or loam surface layer

Contrasting Components
Hoytville soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 6.5 inches to a depth of 56 inches
Cation-exchange capacity of the surface layer: 13 to 29 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: F-7
Prime farmland: Prime farmland if drained
Hydric soil: No

NpB2—Nappanee silty clay loam, 2 to 6 percent slopes, eroded

Setting
Landform: Dissected areas on lake plains
Position on the landform: Shoulders, backslopes
Size of areas: 3 to 20 acres

Map Unit Composition
Nappanee and similar components: 90 percent

Similar components
Poorly drained soils
Moderately well drained soils
More sand and less clay in the subsoil
Uneroded areas with loam or silt loam surface layer

Contrasting Components
Hoytville soils in depressions and drainageways: 10 percent

Soil Properties and Qualities

Available water capacity: About 4.9 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing

pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: F-7
Prime farmland: Prime farmland if drained
Hydric soil: No

NrA—Nappanee-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 10 to 50 acres

Map Unit Composition
Nappanee and similar components: 50 percent
Urban land and similar components: 40 percent

Similar components
Poorly drained soils
More sand and less clay in the subsoil
Moderately well drained soils
Silt loam or clay loam surface layer

Contrasting Components
Hoytville soils in depressions and drainageways: 5 percent
Udorthents adjacent to buildings and streets: 5 percent

Soil Properties and Qualities

Nappanee
Available water capacity: About 5.9 inches to a depth of 49 inches

Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till
Permeability: Slow in the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Nappanee-No; Urban land-Unranked

OrA—Oshtemo fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Rises on outwash plains and on beach ridges on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 30 acres

Map Unit Composition
Oshtemo and similar components: 85 percent

Similar components
Thinner subsoil
Loamy fine sand surface layer and subsoil
More clay and less sand in the subsoil
Till at 60 to 80 inches
Moderately well drained soils

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Somewhat poorly drained soils in depressions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent

Parent material: Stratified loamy, sandy, and gravelly deposits
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3s
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

OrB—Oshtemo fine sandy loam, 2 to 6 percent slopes

Setting
Landform: Knolls on outwash plains and on beach ridges on lake plains
Position on the landform: Backslopes, summits, shoulders
Size of areas: 5 to 75 acres

Map Unit Composition
Oshtemo and similar components: 93 percent

Similar components
Darker colored surface layer
More clay and less sand in the subsoil
Till at 60 to 80 inches
Moderately well drained soils
Loamy sand or loamy fine sand surface layer and upper subsoil
Thinner subsoil

Contrasting Components
Somewhat poorly drained soils at the base of slopes: 3 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent
Vaughnsville soils at the base of slopes: 2 percent

Soil Properties and Qualities

Available water capacity: About 6.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Stratified loamy, sandy, and gravelly deposits
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to use as building sites.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

OrC—Oshtemo fine sandy loam, 6 to 12 percent slopes

Setting
Landform: Knolls on outwash plains and on beach ridges on lake plains
Position on the landform: Backslopes, shoulders
Size of areas: 5 to 15 acres

Map Unit Composition
Oshtemo and similar components: 95 percent

Similar components
Darker colored surface layer
Loamy sand or loamy fine sand surface layer and upper subsoil
Moderately well drained soils
More clay and less sand in the subsoil
Till at 60 to 80 inches
Thinner subsoil

Contrasting Components
Vaughnsville soils at the base of slopes: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2 to 12 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Stratified loamy, sandy, and gravelly deposits
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-1
Prime farmland: Not prime farmland
Hydric soil: No

OsB—Oshtemo sandy loam, till substratum, 2 to 6 percent slopes

Setting
Landform: Knolls on outwash plains and on beach ridges on lake plains
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Oshtemo, till substratum and similar components: 92 percent

Similar components
Darker colored surface layer
Loamy sand or loamy fine sand surface layer
Moderately well drained soils
More clay and less sand in the subsoil
Till at 40 to 60 inches
Slopes of 0 to 2 percent

Contrasting Components
Aurand soils in seep areas or at the base of slopes: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 3 percent

Soil Properties and Qualities

Available water capacity: About 6.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Stratified loamy, sandy, and gravelly deposits overlying till
Permeability: Moderately rapid in the solum, very rapid in the upper part of the substratum, and slow or very slow in the till substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Sandy loam
Potential for surface runoff: Very low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. Special design of structures is needed to prevent damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

OwB—Ottokee loamy fine sand, 0 to 6 percent slopes

Setting
Landform: Knolls and rises on outwash plains
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 15 acres

Map Unit Composition
Ottokee and similar components: 80 percent

Similar components
Darker colored surface layer
More rock fragments in the substratum
Finer textured strata in the subsoil
Somewhat poorly drained soils

Contrasting Components
Gilford soils in depressions and at the base of slopes: 10 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent

Soil Properties and Qualities

Available water capacity: About 5.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 2 to 10 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Sandy deposits
Permeability: Rapid
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 3s
Pasture and hayland suitability group: B-1
Prime farmland: Not prime farmland
Hydric soil: No

PbA—Patton silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats and depressions on lake plains
Size of areas: 5 to over 200 acres

Map Unit Composition
Patton and similar components: 85 percent

Similar components
Till at 60 to 80 inches
Surface layer less than 10 inches thick
More clay in the subsoil

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Del Rey soils on rises: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 31 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Moderate in the solum and moderately slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

PmA—Pewamo silty clay loam, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on end moraines, ground moraines, disintegration moraines, and lake plains
Size of areas: 5 to 300 acres

Map Unit Composition
Pewamo and similar components: 94 percent

Similar components
Surface layer less than 10 inches thick
Bedrock at 60 to 80 inches
Clay or clay loam surface layer
Lighter colored surface layer
Small closed depressions with 10 to 25 inches of silty overwash overlying up to 6 inches of organic material and the underlying lacustrine sediments on the Defiance moraine
Undrained areas of Pewamo soils in wooded areas

Contrasting Components
Blount soils on rises: 3 percent
Elliott soils on rises: 2 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 1 percent

Soil Properties and Qualities

Available water capacity: About 10.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Till
Permeability: Moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

PnA—Pewamo-Urban land complex, 0 to 2 percent slopes

Setting
Landform: Drainageways and depressions on end moraines, disintegration moraines, ground moraines, and lake plains
Size of areas: 3 to 50 acres

Map Unit Composition
Pewamo and similar components: 50 percent
Urban land and similar components: 30 percent

Similar components
Till below 80 inches
More sand and less clay in the subsoil

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Blount soils on rises and knolls: 7 percent
Udorthents or Aquents adjacent to buildings and streets: 3 percent

Soil Properties and Qualities

Pewamo
Available water capacity: About 10.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 34 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Till
Permeability: Moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Urban land

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Pewamo-Yes; Urban land-Unranked

Pt—Pits, quarry

Setting
Landform: Ground moraines, end moraines
Size of areas: 10 to 100 acres and active quarries are continually being enlarged

Map Unit Composition
Pits and similar components: 90 percent

Contrasting Components
Udorthents, loamy in spoil areas: 8 percent
Udorthents, clayey in spoil areas: 2 percent

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Unranked

RcA—Randolph silt loam, 0 to 2 percent slopes

Setting
Landform: Rises on ground moraines and on monadnocks on ground moraines
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Randolph and similar components: 93 percent

Similar components
Bedrock at less than 20 inches
Moderately well drained soils
Darker colored surface layer
More sand and less clay in the subsoil
Loam and silty clay loam surface layer

Contrasting Components
Millsdale soils in depressions and drainageways: 7 percent

Soil Properties and Qualities

Available water capacity: About 4.3 inches to a depth of 25 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root restrictive feature: Bedrock (lithic): 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till overlying limestone or dolostone
Permeability: Moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.

- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty in constructing foundations and installing utilities.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-2
Prime farmland: Prime farmland if drained
Hydric soil: No

RgB—Rawson sandy loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Backslopes, shoulders
Size of areas: 3 to 15 acres

Map Unit Composition
Rawson and similar components: 95 percent

Similar components
Somewhat poorly drained soils
Till at 40 to 60 inches
Loam surface layer

Contrasting Components
Poorly drained soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 5 to 17 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 24 to 48 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Loamy deposits and the underlying till
Permeability: Moderate in the upper part of the solum and slow or very slow in the lower part of the solum and in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Sandy loam
Potential for surface runoff: High
Wind erosion hazard: High

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

RhA—Rensselaer loam, till substratum, 0 to 1 percent slopes

Setting
Landform: Flats, depressions, and drainageways on ground moraines and lake plains
Size of areas: 5 to 100 acres

Map Unit Composition
Rensselaer, till substratum and similar components: 88 percent

Similar components
Silt loam or clay loam surface layer
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick
Till at 40 to 60 inches

Till below 80 inches

Contrasting Components
Tiderishi soils on rises: 7 percent
Jenera soils on rises: 3 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 29 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Perched
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy deposits overlying till
Permeability: Moderate in the solum and the upper part of the substratum, and slow or moderately slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: Yes

RnA—Rimer loamy sand, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 15 acres

Map Unit Composition
Rimer and similar components: 95 percent

Similar components
Poorly drained soils
Loamy fine sand surface layer
Till at 40 to 60 inches
Darker colored surface layer
Moderately well drained soils

Contrasting Components
Mermill soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 3 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Sandy deposits and the underlying till
Permeability: Rapid in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loamy sand
Potential for surface runoff: Medium
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Not prime farmland
Hydric soil: No

RoA—Rimer loamy fine sand, deep phase, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Rimer, deep phase and similar components: 95 percent

Similar components
Sandy layer less than 20 inches thick
More clay and less sand in the subsoil
Moderately well drained soils
Till at 60 to 80 inches

Contrasting Components
Rensselaer soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 3 to 15 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Sandy deposits and the underlying till
Permeability: Rapid in the upper part of the solum, moderately rapid in the lower part of the solum, rapid in the upper part of the substratum, and slow or moderately slow in the lower part of the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loamy fine sand
Potential for surface runoff: Negligible
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Subsurface drainage helps to lower the seasonal high water table.
- The effectiveness of subsurface drains may be reduced because the drains can become filled with sand.
- Plant nutrients are leached at an accelerated rate because of the sandy layer.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the upper part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability in the lower part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

RtA—Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Natural levees, flats, and rises on flood plains
Size of areas: 5 to 150 acres

Map Unit Composition
Rossburg and similar components: 85 percent

Similar components
More silt and less sand in the surface layer
Dark colored surface layer more than 24 inches thick
Lighter colored surface layer
Moderately well drained soils
Loam surface layer
More rock fragments in the substratum

Contrasting Components
Sloan soils in backswamps: 10 percent
Rarely flooded areas on slightly higher areas: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 32 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: Greater than 6 feet
Ponding: None
Drainage class: Well drained
Flooding duration: Brief
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Alluvium
Permeability: Moderate in the solum and moderately rapid in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: A-5
Prime farmland: All areas are prime farmland
Hydric soil: No

SeA—Shawtown loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on beach ridges on lake plains, on outwash plains, and on outwash areas on ground moraines and end moraines
Position on the landform: Shoulders, summits
Size of areas: 5 to 20 acres

Map Unit Composition
Shawtown and similar components: 85 percent

Similar components
Less clay and more sand in the subsoil
Well drained soils
Sandy loam or fine sandy loam surface layer
Darker colored surface layer

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 10 percent
Lamberjack soils in depressions: 3 percent
Alvada soils in drainageways and depressions: 2 percent

Soil Properties and Qualities

Available water capacity: About 7.9 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 50 to 70 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified glaciolacustrine or water-sorted deposits overlying till
Permeability: Moderate in the loamy solum, rapid in the sandy and gravelly substratum, and slow or very slow in the till substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- This soil is well suited to cropland.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the middle part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

SeB—Shawtown loam, 2 to 6 percent slopes

Setting
Landform: Knolls on beach ridges on lake plains, on outwash plains, and on outwash areas on ground moraines and end moraines
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Shawtown and similar components: 91 percent

Similar components
Less clay and more sand in the subsoil
Till at 40 to 50 inches
Well drained soils
Sandy loam or fine sandy loam surface layer
Till below 80 inches

Contrasting Components
Lamberjack soils at the base of slopes and in seep areas: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 4 percent

Soil Properties and Qualities

Available water capacity: About 8.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 50 to 70 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified glaciolacustrine or water-sorted deposits overlying till
Permeability: Moderate in the loamy solum, rapid in the sandy and gravelly substratum, and slow or very slow in the till substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the middle part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

SfB—Shinrock silt loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 35 acres

Map Unit Composition
Shinrock and similar components: 95 percent

Similar components
Somewhat poorly drained soils
Till at 40 to 80 inches
Eroded areas with silty clay loam surface layer
More silt and less clay in the subsoil
Rock fragments in the subsoil and substratum

Contrasting Components
Patton soils in depressions: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Moderately slow in the upper part of the solum and moderate or moderately slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

SgC2—Shinrock silty clay loam, 6 to 12 percent slopes, eroded

Setting
Landform: Dissected areas on lake plains
Position on the landform: Shoulders, backslopes
Size of areas: 5 to 25 acres

Map Unit Composition
Shinrock and similar components: 90 percent

Similar components
Uneroded areas with silt loam surface layer
Till at 40 to 80 inches
Well drained soils
Rock fragments in the subsoil and substratum

Contrasting Components
Del Rey on 0 to 3 percent slopes along drainageways and in seep areas: 8 percent
Poorly drained soils in depressions: 2 percent

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Moderately slow in the upper part of the solum and moderate or moderately slow in the lower part of the solum and in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.

- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: A-6
Prime farmland: Not prime farmland
Hydric soil: No

SkB—Shinrock, till substratum-Glynwood complex, 1 to 4 percent slopes

Setting
Landform: Knolls on disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Size of areas: 5 to 50 acres

Map Unit Composition
Shinrock, till substratum and similar components: 50 percent
Glynwood and similar components: 40 percent

Similar components
Till at 40 to 60 inches
Eroded areas with silty clay loam surface layer
More sand and less clay in the subsoil
Somewhat poorly drained soils

Contrasting Components
Pewamo soils in depressions and drainageways: 5 percent
Poorly drained soils in depressions: 5 percent

Soil Properties and Qualities

Shinrock, till substratum
Available water capacity: About 8.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Glaciolacustrine deposits overlying till
Permeability: Moderately slow in the upper part of the solum, moderate or moderately slow in the lower part of the solum and the upper part of the substratum, and slow or very slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Glynwood

Available water capacity: About 5.9 inches to a depth of 39 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 25 to 50 inches
Depth to the top of the seasonal high water table: 1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- The root system of winter grain crops may be damaged by frost action.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: Shinrock, till substratum-A-6; Glynwood-A-6
Prime farmland: All areas are prime farmland
Hydric soil: Shinrock, till substratum-No; Glynwood-No

SmA—Shoals silt loam, 0 to 2 percent slopes, occasionally flooded

Setting
Landform: Flats and rises on flood plains
Size of areas: 5 to 100 acres

Map Unit Composition
Shoals and similar components: 95 percent

Similar components
Poorly drained soils
Loam surface layer
Moderately well drained soils
Till at 40 to 80 inches

Contrasting Components
Sloan soils in backswamps: 5 percent

Soil Properties and Qualities

Available water capacity: About 11.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 27 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding duration: Brief
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Alluvium
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-3
Prime farmland: Prime farmland if drained
Hydric soil: No

SnA—Sloan loam, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flats and backswamps on flood plains
Size of areas: 5 to 35 acres

Map Unit Composition
Sloan and similar components: 90 percent

Similar components
Silt loam surface layer
Till at 60 to 80 inches
More silt and less sand in the subsoil
Lighter colored surface layer

Contrasting Components
Medway soils on slightly higher parts of the flood plain: 5 percent
Shoals soils on slightly higher parts of the flood plain: 5 percent

Soil Properties and Qualities

Available water capacity: About 10.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderate or moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.
- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-3
Prime farmland: Prime farmland if drained
Hydric soil: Yes

SoA—Sloan silty clay loam, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flats and backswamps on flood plains
Size of areas: 5 to 50 acres

Map Unit Composition
Sloan and similar components: 90 percent

Similar components
Silt loam surface layer
Till at 60 to 80 inches
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick
Lighter colored surface layer

Contrasting Components
Medway soils on higher parts of the flood plain or in areas adjacent to the stream channel: 5 percent
Shoals soils on slightly higher parts of the flood plain: 5 percent

Soil Properties and Qualities

Available water capacity: About 10.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 33 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium
Permeability: Moderate or moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.
- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-3
Prime farmland: Prime farmland if drained
Hydric soil: Yes

SpA—Sloan silty clay loam, limestone substratum, 0 to 1 percent slopes, occasionally flooded

Setting
Landform: Flats and backswamps on flood plains
Size of areas: 5 to 30 acres

Map Unit Composition
Sloan, limestone substratum and similar components: 90 percent

Similar components
Bedrock at 40 to 60 inches
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick
Lighter colored surface layer
Bedrock at 80 to 120 inches

Contrasting Components
Medway soils on higher parts of the flood plain or in areas adjacent to the stream channel: 5 percent
Shoals soils on slightly higher parts of the flood plain: 5 percent

Soil Properties and Qualities

Available water capacity: About 10.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 33 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Bedrock (lithic): 60 to 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding duration: Brief
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Alluvium overlying limestone or dolostone
Permeability: Moderate or moderately slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of groundwater contamination.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Flooding may result in damage to haul roads and increased maintenance costs.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent damage caused by flooding.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.
- This soil is generally unsuited to septic tank absorption fields. The flooding in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-3
Prime farmland: Prime farmland if drained
Hydric soil: Yes

StB2—St. Clair silty clay loam, 2 to 6 percent slopes, eroded

Setting
Landform: Knolls and dissected areas on end moraines
Position on the landform: Shoulders, backslopes
Size of areas: 5 to 40 acres

Map Unit Composition
St. Clair and similar components: 90 percent

Similar components
Uneroded areas with silt loam or loam surface layer
More sand and less clay in the upper part of the subsoil
Till at 40 to 60 inches
Somewhat poorly drained soils

Contrasting Components
Poorly drained soils in drainageways: 5 percent
Severely eroded areas with carbonates at less than 18 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 6.0 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 55 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained

Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3e
Pasture and hayland suitability group: F-5
Prime farmland: All areas are prime farmland
Hydric soil: No

StC2—St. Clair silty clay loam, 6 to 12 percent slopes, eroded

Setting
Landform: Dissected areas on end moraines and lake plains
Position on the landform: Shoulders, backslopes

Size of areas: 5 to 25 acres

Map Unit Composition
St. Clair and similar components: 95 percent

Similar components
Somewhat poorly drained soils on nearly level toeslopes
Uneroded areas with silt loam surface layer
Slopes of 12 to 18 percent

Contrasting Components
Severely eroded areas with carbonates at less than 18 inches on similar landform positions: 5 percent

Soil Properties and Qualities

Available water capacity: About 5.5 inches to a depth of 42 inches
Cation-exchange capacity of the surface layer: 12 to 28 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 20 to 55 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Till
Permeability: Slow in the solum and slow or very slow in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.
- In some areas the high content of clay in the subsoil increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 4e
Pasture and hayland suitability group: F-5
Prime farmland: Not prime farmland
Hydric soil: No

ThA—Thackery loam, till substratum, 0 to 2 percent slopes

Setting
Landform: Rises and flats on outwash plains and stream terraces
Position on the landform: Summits, shoulders
Size of areas: 5 to 35 acres

Map Unit Composition
Thackery, till substratum and similar components: 80 percent

Similar components
Less rock fragments throughout
Well drained soils
Somewhat poorly drained soils
Till below 80 inches
Sandy loam surface layer
Till at 40 to 60 inches
Gravelly sandy loam in the upper part of the substratum

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 12 percent
Alvada soils in seep areas and depressions: 5 percent
Houcktown soils on similar landform positions: 3 percent

Soil Properties and Qualities

Available water capacity: About 10.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 60 to 80 inches
Depth to the top of the seasonal high water table: 1.0 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy, sandy, and gravelly deposits overlying till
Permeability: Moderate in the loamy solum, rapid or very rapid in the gravelly substratum, and slow or very slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Systematic subsurface drainage will extend the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- Moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other

structures may require some special design and construction techniques or maintenance.
- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability in the middle part of the soil limits the proper treatment of the effluent from septic systems in areas of this soil. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability in the upper part of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups
Land capability classification: 1
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

TkA—Tiderishi loam, 0 to 2 percent slopes

Setting
Landform: Rises and flats on lake plains
Position on the landform: Summits
Size of areas: 5 to 100 acres

Map Unit Composition
Tiderishi and similar components: 85 percent

Similar components
More clay and less sand in the subsoil
Dark colored surface layer less than 10 inches thick
Lighter colored surface layer
Moderately well drained soils
Till at 20 to 40 inches
Till at 60 to 80 inches

Contrasting Components
Alvada soils in depressions and drainageways: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 5 percent
Rensselaer soils in depressions and drainageways: 5 percent

Soil Properties and Qualities

Available water capacity: About 8.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 25 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Stratified loamy glaciolacustrine deposits overlying till
Permeability: Moderate in the solum, and moderately slow or slow in the substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

TnA—Toledo silty clay loam, 0 to 1 percent slopes

Setting
Landform: Depressions and drainageways on lake plains
Size of areas: 5 to 20 acres

Map Unit Composition
Toledo and similar components: 90 percent

Similar components
Dark colored surface layer more than 10 inches thick
Silty clay or clay loam surface layer
Lighter colored surface layer

Contrasting Components
Fulton soils on rises: 10 percent

Soil Properties and Qualities

Available water capacity: About 7.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 36 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Glaciolacustrine deposits
Permeability: Slow
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil to facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Ponding restricts the safe use of roads by log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 3w
Pasture and hayland suitability group: C-2
Prime farmland: Prime farmland if drained
Hydric soil: Yes

ToB—Tuscola loamy fine sand, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Backslopes, summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Tuscola and similar components: 93 percent

Similar components
Slopes of 0 to 2 percent
Less clay and more sand in the subsoil
Till at 40 to 80 inches
More clay and less sand in the subsoil
Well drained soils
Somewhat poorly drained soils with thicker sandy layers

Contrasting Components
Poorly drained soils in depressions: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Available water capacity: About 10.1 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 4 to 13 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Stratified glaciolacustrine deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Loamy fine sand
Potential for surface runoff: Low
Wind erosion hazard: Severe

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

TpA—Tuscola fine sandy loam, 0 to 2 percent slopes

Setting
Landform: Flats and rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 25 acres

Map Unit Composition
Tuscola and similar components: 93 percent

Similar components
Darker colored surface layer
Loam or loamy fine sand surface layer
More clay and less sand in the subsoil
Somewhat poorly drained soils

Contrasting Components
Poorly drained and very poorly drained soils in depressions: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Available water capacity: About 10.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified glaciolacustrine deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low

strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

TpB—Tuscola fine sandy loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Shoulders, backslopes, summits
Size of areas: 5 to 35 acres

Map Unit Composition
Tuscola and similar components: 93 percent

Similar components
Slopes of 0 to 2 percent
Loam or loamy fine sand surface layer
Well drained soils
Less clay in the subsoil
Somewhat poorly drained soils with a dark colored surface layer

Contrasting Components
Poorly drained soils in depressions: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities
Available water capacity: About 10.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified glaciolacustrine deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Fine sandy loam
Potential for surface runoff: Low
Wind erosion hazard: Moderate

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Maintaining vegetative cover and establishing windbreaks reduce the hazard of wind erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.

- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

TuB—Tuscola silt loam, 2 to 6 percent slopes

Setting
Landform: Knolls on lake plains
Position on the landform: Shoulders, backslopes
Size of areas: 5 to 20 acres

Map Unit Composition
Tuscola and similar components: 95 percent

Similar components
Loam surface layer
More silt and less clay in the subsoil
Well drained soils

Contrasting Components
Poorly drained soils on flats and in depressions: 5 percent

Soil Properties and Qualities

Available water capacity: About 10.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5 to 18 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified glaciolacustrine deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low

strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2e
Pasture and hayland suitability group: A-6
Prime farmland: All areas are prime farmland
Hydric soil: No

UcA—Udorthents, loamy, 0 to 2 percent slopes

Setting
Landform: Ground moraines, end moraines
Size of areas: 10 to 75 acres

Map Unit Composition
Udorthents and similar components: 75 percent

Similar components
Slopes of 2 to 6 percent

Contrasting Components
Buildings, roads, and parking lots: 10 percent
Areas of undisturbed soil: 5 percent
Dense till at or near the surface: 5 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 5 percent

Soil Properties and Qualities

General description: Areas that have had soil material either added or removed during construction activities, on building sites, idle land, sanitary landfills, and along interstate interchanges
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Ponding: None
Flooding: None

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: No

UcD—Udorthents, loamy, 2 to 25 percent slopes

Setting
Landform: Ground moraines, end moraines
Size of areas: 5 to 50 acres

Map Unit Composition
Udorthents and similar components: 85 percent

Similar components
Slopes of 0 to 2 percent

Contrasting Components
Areas of undisturbed soil: 5 percent
Dense till at or near the surface: 5 percent
Roads: 5 percent

Soil Properties and Qualities

General description: Areas that have had soil material either added or removed during construction activities, on idle land, sanitary landfills, and along interstate interchanges
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Ponding: None
Flooding: None

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: No

Ur—Urban land

Setting
Size of areas: 10 to 100 acres

Map Unit Composition
Urban land and similar components: 88 percent

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 12 percent

Use and Management Considerations

- On-site investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: None assigned
Pasture and hayland suitability group: None assigned
Prime farmland: Not prime farmland
Hydric soil: Unranked

VaA—Vanlue loam, 0 to 2 percent slopes

Setting
Landform: Rises on lake plains
Position on the landform: Summits, shoulders
Size of areas: 5 to 45 acres

Map Unit Composition
Vanlue and similar components: 90 percent

Similar components
Till at 20 to 40 inches
Darker colored surface layer
Moderately well drained soils
Till at 60 to 80 inches
Sandy loam surface layer

Contrasting Components
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 8 percent
Very poorly drained soils in depressions: 2 percent

Soil Properties and Qualities

Available water capacity: About 9.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6 to 21 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Depth to the top of the seasonal high water table: 0.5 to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Stratified loamy and silty glaciolacustrine deposits overlying till
Permeability: Moderate in the loamy solum and moderately slow in the lower part of the solum and glaciolacustrine substratum and slow or moderately slow in the till substratum
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site

development and structures may need special design to avoid damage from wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of this soil.
- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: C-1
Prime farmland: Prime farmland if drained
Hydric soil: No

VeA—Vaughnsville loam, 0 to 3 percent slopes

Setting
Landform: Beach ridges on lake plains
Position on the landform: Footslopes
Size of areas: 10 to 25 acres

Map Unit Composition
Vaughnsville and similar components: 100 percent

Similar components
Aurand
Till at 40 to 60 inches
Browner colors in the surface layer and upper subsoil

Soil Properties and Qualities

Available water capacity: About 7.1 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 9 to 22 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Dense material: 40 to 60 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy glaciolacustrine deposits and the underlying till
Permeability: Moderate in the upper part of the solum, slow or moderately slow in the lower part of the solum, and slow or very slow in the substratum
Potential frost action: Moderate
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- This soil is well suited to cropland.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.

Building sites

- The seasonal high water table may restrict the period when excavations can be made and may require a higher degree of construction site development and building maintenance. It is poorly suited to building site development and structures may need special design to avoid damage from wetness.
- In some areas the dense nature of the substratum increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table in areas of this soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local Roads and Streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 1
Pasture and hayland suitability group: A-1
Prime farmland: All areas are prime farmland
Hydric soil: No

WeA—Westland-Rensselaer complex, 0 to 1 percent slopes

Setting
Landform: Flats on glacial drainage channels; drainageways and depressions on outwash plains
Size of areas: 20 to 200 acres

Map Unit Composition
Westland and similar components: 50 percent
Rensselaer and similar components: 40 percent

Similar components
Till at 60 to 80 inches
Clay loam or silty clay loam surface layer
Dark colored surface layer less than 10 inches thick

Contrasting Components
Darroch soils on rises: 4 percent
Lamberjack soils on rises: 4 percent
Rarely flooded areas adjacent to the Blanchard River and its tributaries: 2 percent

Soil Properties and Qualities

Westland
Available water capacity: About 9.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 26 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loamy deposits and the underlying sandy and gravelly outwash
Permeability: Moderate in the solum and very rapid in the underlying sandy and gravelly material
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Soil Properties and Qualities

Rensselaer
Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 29 meq per 100 grams
Depth class: Very deep
Depth to root restrictive feature: Greater than 80 inches
Water table kind: Apparent
Ponding: Brief
Depth of ponding: 0.0 to 1.0 feet
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 6.0 percent
Parent material: Loamy deposits
Permeability: Moderate
Potential frost action: High
Rock fragments on surface: None
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers help to minimize the possibility of ground water contamination.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.

Woodland

- Soil wetness may limit the use of this soil by log trucks.
- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low strength of the soil may cause the formation of ruts, which can result in unsafe conditions and damage to equipment.
- The low strength of the soil increases the cost of constructing haul roads and log landings.
- Because of low soil strength, harvesting equipment may be difficult to operate and damage may result. The low strength of the soil may create unsafe conditions for log trucks.
- Ponding restricts the safe use of roads by log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuited to use as a site for septic tank absorption fields.

Local Roads and Streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of this soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The low bearing strength of this soil is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by low soil strength.

Interpretive Groups

Land capability classification: 2w
Pasture and hayland suitability group: Westland-C-1; Rensselaer-C-1
Prime farmland: Prime farmland if drained
Hydric soil: Westland-Yes; Rensselaer-Yes

Important Farmland

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, woodland, 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.

About 327,000 acres in the county, or about 96 percent of the total acreage in the county, meets the soil requirements for prime farmland as defined by the Natural Resources Conservation Service. Hancock County consists of dominantly prime farmland soils, however, small areas of soils not meeting the requirement are scattered throughout the county.
Most of the prime farmland in the county is used as cropland. Urbanization in and around the cities of Findlay and Fostoria, and along the Interstate 75 corridor account for the majority of prime farmland lost to agricultural uses.

The map units in the survey area that are considered prime farmland are listed in table 5. Prime farmland also is identified in table 34. 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. On-site evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high- quality crop when treated and managed by acceptable farming methods. Examples of such crops are tree fruits, berries, and vegetables.

Unique farmland has an adequate supply of available moisture for the specific crops for which it is used because of stored moisture, precipitation, or irrigation and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime farmland and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and

oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by state law.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of this land are developed as needed in cooperation with conservation districts and others.

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, however, 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, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period 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 on-site 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 map units in table 6 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, on-site investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

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.

The map units in table 7, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. On-site investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; 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 both verbal and numerical. Map units that have very similar properties may have different interpretations for some uses because of slight differences in depth to a restrictive layer, differences in what the thickest layer is, or other differences. In some cases, there may be not be complete correlation between the hazards and limitations noted in the tables and the management statements addressed in the map unit descriptions. These discrepancies are usually for minor limitations or hazards which have numerical value of .10 or less in the tables.

Rating Class Terms

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, poor, and very poor.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed map units in the county for crops are shown in table 8. The main concerns in managing nonirrigated cropland are controlling flooding and controlling water erosion, reducing wind erosion, removing excess water, reducing surface crusting, reducing compaction, , and maintaining soil tilth, organic matter, and fertility.

Generally, a combination of several practices is needed to control *water erosion*. Conservation tillage, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss

In addition, a combination of several practices is needed to control *wind erosion*. Conservation tillage, conservation cropping systems, crop residue management, and field windbreaks help to prevent excessive soil loss.

Surface and/or subsurface drainage is used to lower *seasonal high water tables* and to reduce *ponding*.

Tilling within the proper range in moisture content minimizes *surface compaction*.

Measures that are effective in maintaining *soil tilth, organic matter, and fertility* include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are *ponding, flooding, slope,* and *depth to bedrock*-.

Ponding--Surface drains help to remove excess surface water and reduce damage from ponding.

Flooding--Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding becomes less of a hazard.

Slope--Where the slope is more than 25 percent, water erosion can be excessive on cultivated fields. The use of equipment is limited. Cultivation may be restricted. D and E slope map units are generally unsuited to row crops.

Depth to bedrock--Rooting depth and available moisture may be limited by bedrock within a depth of 40 inches.

Additional limitations and hazards are as follows:

Potential for ground water pollution--This is a hazard in soils with excessive permeability, bedrock, or an apparent water table within the profile.

Root restrictive layer--Soil layers with high bulk density have little pore space. These layers limit water storage and restrict penetration of plant roots.

Limited available water capacity, poor or fair tilth, and *surface crusting*--These limitations can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Surface stones--Stones or boulders on the surface can hinder normal tillage unless they are removed.

Surface rock fragments--This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Very high clay content.--A very high clay content in the subsoil and substratum restricts rooting depth.

High clay content.--A high clay content in the subsoil and substratum restricts rooting depth.

Surface crusting--Hardening of the bare soil surface can hinder or prevent seedling emergence. Reduced tillage slows destruction of soil structure and helps prevent crusting. Regular additions of crop residue, manure, or other organic materials help improve soil structure and minimize crusting.

Frost action--Frost heaving can damage deep rooted legumes and some small grains.

Sandy layers.--Deep leaching of nutrients and pesticides may result from sandy layers. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application. -

Clodding.--Clods may inhibit germination, reduce water infiltration and increase runoff.

Subsidence of organic matter.--Subsidence or shrinking occurs as a result of oxidation in the organic material after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

Wind erosion--The detachment and transportation of soil particles by wind. Cover crops and field windbreaks help protect the soil surface by reducing the amount of exposed surface or by reducing the length of unsheltered areas exposed to prevailing winds.

Following is an explanation of the criteria used to determine the limitations or hazards.

Ponding.--Ponding duration is assigned to the component of the map unit.

Frequent flooding.--The component of the map unit is frequently flooded.

Occasional flooding.--The component of the map unit is occasionally flooded.

High potential for ground water pollution.--The soil has an apparent water table within a depth of 4 feet or bedrock within 60 inches, or permeability is more than 6 inches per hour in at least one layer within the soil and does not have a layer with permeability of 0.2 inches per hour or less within 80 inches of the surface.

Moderate potential for ground water pollution.--Permeability is between 2 and 6 inches per hour in at least one layer within the soil and does not have a layer with permeability of 0.6 inches per hour or less within 80 inches of the surface.

Easily eroded.--The surface K factor multiplied by the average slope is more than 2 (same as prime farmland criteria).

Erosion hazard.--The average slope is more than 2 percent.

Excessive slope.--The upper slope range of the component of the map unit is more than 25 percent.

Most of the surface layer removed by erosion.--The surface layer of the component of the map unit is severely eroded: 75 percent or more of the original A and E horizons has been lost.

Part of the surface layer removed by erosion.--The surface layer of the component of the map unit is eroded: 25 to 75 percent of the original A and E horizons has been lost.

Root restrictive layer.--The component has dense material within 40 inches.

Limited available water capacity.--The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Depth to bedrock.--Bedrock is within a depth of 40 inches.

Surface stones.--The terms describing the texture of the surface layer include any stony or bouldery modifier, or the soil is a stony or bouldery phase.

Surface rock fragments.--The terms describing the texture of the surface layer include any rock fragment modifier except for gravelly or channery, and "surface stones" is not already indicated as a limitation.

Very high clay content.--The component of the map unit has a clay content of more than 60 percent within 40 inches of the soil surface.

High clay content.--The component of the map unit has a clay content of 40 to 60 percent within 40 inches of the soil surface.

Seasonal high water table.--The top of the water table in the component of the map unit is shallower than 1.5 feet, and ponding duration is not assigned.

Surface compaction.--The component of the map unit has a silt loam, silty clay loam, clay loam, or silty clay surface layer.

Poor tilth.--The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or has more than 35 percent clay in the surface layer.

Fair tilth.--The component of the map unit has a silty clay loam or clay loam surface layer with less than 35 percent clay, or is a moderately eroded phase of loam or silt loam.

Restricted permeability.--The component of the map unit has permeability in the soil material that ranges to less than .06 inches/hour within 40 inches of the soil surface.

Surface crusting.--The average organic matter content of the surface layer is less than or equal to 3 percent and the texture is silt loam or silty clay loam.

Clodding.--The component of the map unit has a surface layer with clay content of more than 32 percent.

Sandy layers.--The component of the map unit has sand, loamy sand, loamy fine sand, or fine sand in all layers above 40 inches, or is in a Psammentic or Arenic subgroup.

Frost action.--The component of the map unit has a high potential frost action.

Subsidence of the organic matter.--The organic matter content of the surface layer of the component of the map unit is greater than or equal to 20 percent.

Wind erosion.--The component of the map unit has a wind erodibility group of 1, 2, or 3.

Crops and Pasture

Kelly Niehaus, NRCS District Conservationist, assisted in the preparation of this section.

General management needed for crops and pasture is suggested in this section. "Crops" are considered to be row crops and hay. The system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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

Cropland Management

Prime agricultural land is dispersed throughout the county. With good management practices, most soils are highly productive for crops and pasture. Major soil management concerns are based upon similarities and differences in soil properties and qualities associated with the different types of soil. The major soil management concerns are seasonal wetness (including ponded areas), erosion, soil structure damage (compaction, crusting, clod formation), droughtiness, and soil fertility.

Seasonal wetness and ponding are the major management concerns on about 267,000 acres of land in the county. The very poorly drained Adrian, Alvada, Colwood, Gilford, Hoytville, Mermill, Millsdale, Patton, Pewamo, Rensselaer, Sloan, Toledo, and Westland soils are naturally so wet that crop production is generally not possible unless surface or subsurface drainage is installed. The somewhat poorly drained Aurand, Blount, Darroch, Del Rey, Elliott, Fulton, Haskins, Lamberjack, Nappanee, Rimer, Shoals, Tiderishi, and Vanlue soils are naturally so wet that crops are damaged during most years and planting and harvesting is delayed unless artificial drainage is installed.

Small areas of wet soils in seepy areas, along drainageways, and in swales are common inclusions in areas of the moderately well drained Cygnet, Flatrock, Glynwood, Harrod, Houcktown, Jenera, Medway, Mortimer, Ottokee, Rawson, Shinrock, Thackery, and Tuscola soils. Random subsurface drainage systems are installed in these areas for maximum crop yields.

The design of surface and subsurface drainage systems varies with the kind of soil. A combination of surface and subsurface drainage is needed in many areas of very poorly drained Adrian, Alvada, Colwood, Gilford, Hoytville, Mermill, Millsdale, Patton, Pewamo, Rensselaer, Sloan, Toledo, and Westland soils used for intensive crop production. Drains should be more closely spaced in soils that have slow or very slow permeability than in soils that have moderately slow permeability. Blount, Fulton,

Hoytville, Nappanee, and Toledo soils are slowly permeable or very slowly permeable.

Establishing adequate outlets for subsurface drainage systems can be difficult in some areas of Adrian, Alvada, Colwood, Gilford, Hoytville, Mermill, Millsdale, Patton, Pewamo, Rensselaer, Sloan, Toledo, and Westland soils. Some Pewamo units on the Defiance Moraine contain numerous closed depressions (potholes) that are very difficult to drain. These map units are more difficult to drain than other Pewamo units in the county. Existing county and private drainage systems should be maintained as adequate outlets for present and future land uses. These systems often become outlets for basement and septic system curtain drains in many areas of Hancock County. Urban construction activities can damage and disrupt these existing systems. As a result, renewed wetness and ponding of these previously drained cropland areas now impact homeowners' use of this land. Cooperation between the urban and agricultural communities is needed in order to maintain or improve these drainage systems.

Information about the design of drainage systems for each kind of soil is provided in the Field Office Technical Guide, which is available in the local office of the Natural Resources Conservation Service and the Hancock Soil and Water Conservation District.

Erosion by water is a major concern on about 74,000 acres of land in the county. On bare soils, erosion is generally a hazard where the slope is more than 2 percent. The hazard increases as the slope increases.

Erosion reduces natural soil fertility and productivity as the original topsoil is removed and the more acid subsoil is incorporated into the surface layer through tillage. The need for lime and fertilizer to replace lost plant nutrients and maintain productivity is increased. If the amount of annual soil loss exceeds the rate at which new soil is formed, long-term productivity and natural fertility are affected. Loss of the original topsoil is of particular concern in areas of soils that have a high content of clay in the subsoil, such as Biglick, Blount, Glynwood, Lucas, Milton, Morley, Mortimer, Nappanee, Shinrock, and St. Clair soils.

Erosion increases the cost of crop production, results in poor soil structure in the surface layer, increases the need for tillage to incorporate organic matter into the surface layer, and reduces the available water capacity of the surface layer. Tillage for preparing a good seedbed requires more energy in eroded spots in many sloping fields. Lower plant populations result from inadequate soil-to-seed contact and a lower available water capacity. These more eroded spots are common in areas of Glynwood, Lucas, Morley, Mortimer, Nappanee, Shinrock, and St. Clair soils.

Eroding soil particles with attached nutrients, herbicides, and pesticides enter drainageways, streams, rivers, ponds, lakes, and reservoirs. These sediments can fill drainage ditches and block subsurface drainage outlets. Sediment removal is the most costly item in ditch maintenance. Controlling erosion protects the soil resource base, maintains long-term productivity, reduces drainage maintenance costs, and improves water quality.

Classes in "Potential for surface runoff" in detailed map unit descriptions was calculated using the following rules. The soil surface is assumed to be bare and surface water retention due to irregularities in the ground surface is low. Additionally, a standardized antecedent water state condition prior to the water addition is assumed: the soil is conceived to be very moist or wet to the base of the soil, to 1/2 m, or through the horizon or layer with minimum saturated hydraulic conductivity within 1 meter, whichever is the greatest depth. If the minimum saturated hydraulic conductivity of the soil occurs below 1 meter, it is disregarded and the minimum "to and including 1 m" is employed. (United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual.)

Wind erosion is a problem on some soils in the survey area. Sandy soils, such as Arkport, Dunbridge, Ottokee, Rimer, and Tuscola soils, and soils with a muck surface layer, such as Adrian soils, are particularly susceptible to this type of erosion. The abrasive action of windblown sand particles damages crops. Reducing tillage, avoiding fall plowing, and using cover crops can reduce the hazard of wind erosion. Sod strips and windbreaks can reduce the effects of wind velocity and the resulting wind-transported soil particle damage to plants.

Management measures that control erosion include crop rotations, cover crops, crop residue management, water- and sediment-control basins (WASCOBS), grassed waterways, and conservation tillage. Also, plowing in the spring rather than in the fall helps to control erosion. Management measures that conform to a particular cropping system can be selected to keep soil loss to an amount that will not reduce long-term productivity.

Crop rotations that include cover crops and grasses and legumes reduce the hazard of erosion by providing plant cover for extended periods. These rotations protect bare soil from the erosive forces of raindrop splash and water runoff. Increased water infiltration occurs as soil structure improves in the surface layer. The proportion of hay or pasture in the rotation should increase as the percent of slope increases.

A system of conservation tillage, including no-till planting, that leaves crop residue on the surface can help to control erosion on most of the soils in the county. Such a system is best suited to well drained and moderately well drained soils that dry and warm early in the spring. Installing surface and subsurface drainage on somewhat poorly drained, poorly drained, and very poorly drained soils is necessary if conservation tillage systems are used. Water- and sediment-control basins can be used in place of grassed waterways on small watersheds. These basins are earth embankments, generally constructed across the slope of minor watercourses. This practice traps sediment and minimizes gully erosion. A high level of management, including weed and insect control, is also needed.

Soil structure damage in the surface layer is more commonly referred to as compaction, crusting, or clod formation.

Soil compaction is a general management concern on all of the cropland in the county. Pressure applied to the land surface by farm machinery can cause compaction when the soil is soft and compressible because of wetness. As soil structural units are mashed and smeared, the pore space occupied by air and water within these structural units and between the structural units is reduced. Air and water movement into and out of the soil is also restricted, resulting in ponding of surface water. This ponding is especially noticeable at the ends of fields where increased traffic occurs. Root penetration is restricted to the upper part of the subsoil. Lower crop yields are most noticeable at the ends of fields.

Factors that affect compaction on all soils regardless of use include machinery size, weight and design (pounds of force per square inch of soil surface area), and type of farm implements (wheeled versus tracked).

In addition to compaction, soil texture and soil moisture content also affect crusting and clod formation. Crusting, or hardening of the bare soil surface, follows intense rainfall as soon as the surface layer starts to dry. Many of the soils in Hancock County have a surface layer of silt loam or silty clay loam. A crust can form in these soils as the granular soil structure is destroyed by tillage. This crust must be broken before some crop seedlings will be able to emerge, especially in areas that are continuously row cropped and in which conventional tillage systems are used.

Clod formation, or hardening of the entire surface layer, follows tillage when the soil moisture content is too high. It is most noticeable in areas of soils that have a surface layer that is high in content of clay. Additional tillage is needed to break up these clods and to facilitate preparation of a good seedbed. Unless adequate rain is received soon after planting, lower plant populations result from inadequate soil-to-seed contact and inadequate available water.

Compaction, crusting, and clod formation can be minimized by tilling the soil at the proper soil moisture content. Less tillage results in less destruction of soil structure. No-till systems initially result in less pore space for air and water movement. After 2 or 3 years, new soil structural units are formed and pore space increases for air and water movement. More roots in the soil contribute to better soil structure. In addition, decreased tillage results in increased macropore (earthworm burrows) and increases the pore space in the soil. This condition is most noticeable in soils with long term no-tillage management systems, permanent pasture, or where grass is included in the hay part of the crop rotation.

Droughtiness refers to an insufficient amount of water available for good crop growth between rains. Some soils have a higher available water

capacity than others. Droughty soils that are used as cropland or pasture in Hancock County are Arkport, Biglick, Channahon, Dunbridge, Joliet, Millsdale, Milton, Oshtemo, Ottokee, and Randolph soils. Moderate depth to bedrock, stony or gravelly material in the lower part of the subsoil, severe erosion, or any combination of these soil properties and qualities results in a low available water capacity.

Many of the soils in which moisture shortages occur are well suited to a system of conservation tillage, such as no-till planting, that leaves crop residue on the surface (fig. 11).

Figure 11. Blount soils are suited to no-till planting.

The crop residue increases the moisture supply by increasing the rate of water infiltration and by reducing runoff and evaporation rates.

The fertility of a soil depends on the natural fertility level and on past use and management, including previous applications of lime and fertilizer. As a result, fertility can vary widely from field to field, even on the same kind of soil.

About 16 chemical elements are essential to the growth of plants. High crop yields and productive pastures require adequate levels of plant nutrients, lime, and organic matter. Maintaining these levels results in sustained high yields on all of the soils in the county.

Many nutrients are most readily available to plants where the soil is nearly neutral in reaction (pH). They are less readily available where the soil is more acid or more alkaline. Some soils, such as Adrian, are acid in the upper part of the root zone. In these soils, periodic additions of lime are needed to increase the availability of plant nutrients.

Soil texture, organic matter content, and the type of clay minerals influence the cation-exchange capacity of the soil, which affects the storage and availability of nutrients. The ability to store and release plant nutrients increases as the content of clay and organic matter increases. Pewamo soils have a high content of clay and organic matter and a high capacity to store and release plant nutrients. Soils that have a lower content of clay or organic matter, such as Arkport and Ottokee soils, have a reduced capacity to store and release nutrients and lose more nutrients through leaching. On these soils, frequent applications of a small amount of fertilizer can compensate for the nutrients lost through leaching.

On all soils, additions of lime and fertilizer should be based on the results of soil tests and on crop needs for the expected level of yields. The Ohio State University Extension can help in determining the kinds and amounts of fertilizer and lime to be applied.

Organic matter influences many soil properties, including color, structure, tilth, the rate of water infiltration, available water capacity, and cation-exchange capacity. In Hancock County, soils that have a light colored surface layer generally have a moderate or low content of organic matter in the surface layer. Soils that have a dark surface layer have a high content of organic matter. Cultivation tends to lower the organic matter content by increasing the rates of oxidation and erosion on sloping soils. Returning all crop residue to the soil helps to maintain the organic matter content. Cover crops, sod crops, green manure crops, and additions of manure increase the organic matter content.

Sewage sludge can have economic value as a source of organic matter and some plant nutrients. If the sludge is applied to land, management concerns include the application rate, the hazards associated with heavy metals, possible odor problems, and health hazards. The chemical composition of the sludge should be determined before the sludge is applied. Additions of sludge to cropland should be based on analysis of the sludge, the results of soil tests, and the expected level of crop yields. The Ohio State University Extension can provide information about the application of sewage sludge.

Pastureland Management

Some of the acreage in the county is used as pasture. The more common pasture and hay plants are alfalfa, red clover, alsike clover, bluegrass, orchardgrass, tall fescue, timothy, and bromegrass. Pastures are commonly in areas of soils that have severe limitations affecting row crops. Shallow soils, such as Biglick and Channahon soils, or soils on the steeper slopes, such as Lybrand and Morley soils, are commonly used for pasture.

The ability of a pasture to produce forage and to provide enough cover for erosion control is influenced by the number of livestock, the length of the period of grazing, the timeliness of grazing, the forage being grazed, and the availability of water. Good management measures, such as proper stocking rates, pasture rotation, timely deferment of grazing, applications of lime and fertilizer, and control of weeds and insects, help to maintain the key forage plants. Maintaining soil fertility and mowing help to control weeds. The need for lime and fertilizer should be determined by soil tests. The amount of nutrients to be applied should be based on the requirements of the grasses or legumes to be grown.

Erosion control is a management need on gently sloping to very steep soils used for pasture. The hazard of erosion increases as the slope increases. Many of these soils are already eroded. Control of erosion is particularly important when the pasture is seeded. Using a no-till seeding method or growing small grain as a companion crop can help to control further erosion.

Soil compaction is caused by overgrazing or grazing when the soils are wet. It can greatly reduce the vigor of pasture plants. Also, it can increase the runoff rate and the hazard of erosion on sloping soils. Deferment of grazing during wet periods minimizes compaction. Subsurface drains can be effective in removing excess water from pastured areas of soils that are very poorly drained or somewhat poorly drained.

Seeding mixtures should be selected on the basis of soil type and the desired management system. Legumes increase the nutrient value of the forage and provide nitrogen for the growth of grasses. Alfalfa should be seeded on well drained soils that have adequate levels of plant nutrients and lime. The wetter soils are better suited to alsike clover than to red clover or to alfalfa. Information about seeding mixtures, herbicide treatment, and other management measures for specific soils can be obtained from local offices of the Natural Resources Conservation Service or the Ohio State University Extension.

Specialty Crops

The specialty crops grown commercially in Hancock County include vegetables, nursery stock, Christmas trees, and fruits. Very few specialty crops in the county are irrigated . Slope, water-holding capacity, infiltration rates, and rooting depths should be considered in irrigated areas. The slope should not exceed 6 percent. Well drained and moderately well drained soils that have a loamy or sandy surface layer, such as Arkport, Fox, Oshtemo and Ottokee soils, respond best to irrigation. Most irrigation water in the county is obtained from wells and ponds.

Specialty crops grown in Hancock County include potatoes, tomatoes, sugar beets, popcorn, and sweet corn. These crops grow best on very deep, dark colored soils that have a high content of organic matter. Good drainage on the surface and in the root zone are important for high productivity. Vegetables grow well on soils that warm up early and are not susceptible to compaction. Artificial drainage can be used in the more poorly drained areas. Adrian (fig. 12), Alvada, Colwood, Gilford, Mermill, and Rensselaer soils could be farmed intensively for vegetable production.

Figure 12: Adrian soils are suited to specialty crops, such as potatoes.

Orchard crops grown in the county include apple, peach, plum, pear, and cherry trees. Orchard crops grow well on the better drained

soils that have a loamy or sandy surface layer, such as Fox, Gallman, Oshtemo, and Shawtown soils. Areas of loamy or sandy soils underlain with bedrock, such as Dunbridge could be planted to orchards. Most produce is marketed locally through roadside farm markets.

The latest information about growing specialty crops can be obtained from local offices of the Natural Resources Conservation Service and the Ohio State University Extension.

Crop Yield Index

Table 9 is the crop yield index for Hancock County. The yield index reflects the relative productivity of a soil in relation to other soils in the county. It is based on the most productive soil–Colwood loam, 0 to 1 percent slopes, receiving a rating of 100, and other soils are ranked against this standard. Yield data used in developing this table is from the years 1992 to 2000 from research plots on Hoytville map units in Van Wert County and Wood County. Average yields were approximately 161 bushels for corn, 52 bushels for soybeans, and 72 bushels for wheat. The yields listed in the header in Table 9 were calculated based on the Hoytville data. (To calculate the estimated corn yield for CoA, the ratio - HtA crop yield:HtA yield index - was multiplied by the yield index for CoA. 161/84 x 100 = 192 bushels of corn estimated for CoA.)

The yield values and index values used in these calculations assume good management practices are used to produce these crops.

To calculate estimated yields using the table, use the yield index number as a percentage, and multiply it by the crop yield in the table header. For example, to calculate estimated corn yield for AdA, multiply .76 by the corn yield in the header, which is 192. .76 x 192 = 146 bushels of corn estimated for AdA.

Advances in equipment technology, plant genetics, drainage, nutrient and pest management, and soil management make standard yield tables obsolete within several years. This index table provides users with the relative productivity of soils which is less affected by these factors.

To use this yield index in the future to calculate estimated yields, use current yield data.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels=capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, woodland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, woodland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that

restrict their use mainly to grazing, woodland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, 2e. The letter e shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by w, s, or c because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The acreage of soils in each capability class or subclass is shown in table 10. The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units", and in table 34.

Pasture and Hayland Management

Soils are assigned to pasture and hayland groups according to their suitability for the production of forage. The soils in each group are similar enough to be suited to the same species of grasses or legumes, have similar limitations and hazards, require similar management, and have similar productivity levels and other responses to management.

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Suitability for Pasture and Hayland

Table 34 lists the pasture and hayland suitability group symbol for each soil. Soils assigned the same suitability group symbol require the same general management and have about the same potential productivity. The pasture and hayland suitability groups are based on soil characteristics and limitations.

Soils assigned to Group A have few limitations for the management and growth of climatically adapted plants. Those in group A-1 are very deep and well drained or moderately well drained. Surface texture is silty clay loam, fine sandy loam, sandy loam, or loam. Available water capacity ranges from moderate to very high. These soils will respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH in the subsoil can shorten the life of some deep rooted legumes in the stand. Slopes range from 0 to 12 percent.

Soils in group A-3 are deep or very deep and well drained or moderately well drained. Surface texture is silt loam. Slopes range from 18 to 50 percent. Pasture and hayland generally are not recommended on these soils because of the slope.

Soils in group A-5 are very deep and well drained or moderately well drained. They are occasionally flooded. Flooding limits these soils for pasture during periods of stream overflow and sediment lowers the quality of the forage.

Surface texture is silt loam or loam. Available water capacity is moderate or high. Slopes range from 0 to 2 percent.

Soils in group A-6 are very deep and moderately well drained, and are subject to frost action. Frost action can damage legume stands. Mixing fibrous rooted grasses with legumes and proper grazing management help to reduce frost action damage. Surface texture is silt loam, loam, fine sandy loam, loamy fine sand, clay loam, or silty clay loam. Available water capacity is moderate or high. Slopes range from 0 to 18 percent.

Soils in group B limit growth and production due to droughtiness. Those in group B-1 are very deep and well drained or moderately well drained. Surface texture is loam or loamy fine sand. Available water capacity is low. These soils are sandy or coarse-loamy in the subsoil. Slopes range from 0 to 6 percent.

Soils in group C are wet due to a seasonal high water table. Those in group C-1 are very deep and somewhat poorly drained to very poorly drained. Surface texture is silt loam, silty clay loam, silty clay, clay loam, loam, mucky loam, fine sandy loam, loamy fine sand, or loamy sand. Available water capacity ranges from low to high. These soils normally respond well to subsurface drainage. Slopes range from 0 to 4 percent.

Soils in group C-2 are moderately deep to very deep and somewhat poorly drained to very poorly drained. Surface texture is silty clay loam or silt loam. Available water capacity is low or moderate. A high seasonal water table limits the rooting depth of deep rooted forage plants. Some soils have bedrock that also restricts rooting. Shallow rooted species do best on these soils. Subsurface drains are used to lower the seasonal high water table. Effectiveness of subsurface drainage is usually limited by permeability of the subsoil, depth to bedrock, or the landscape position of the soil. These soils will respond better to forages that do not have a tap root because of the limited root zone. Slopes range from 0 to 2 percent.

Soils in group C-3 are very deep and very poorly drained or somewhat poorly drained. They are occasionally or frequently flooded. Flooding limits these soils for pasture during periods of stream overflow and sediment lowers the quality of the forage. Surface texture is silt loam, loam, or silty clay loam. Available water capacity is high. Slopes range from 0 to 2 percent. Frost action may damage legumes. Including grasses in a seeding mixture and proper grazing management reduces damage from frost heaving. A seasonal high water table limits the rooting depth of forage plants. Shallow rooted species do best on these soils. Subsurface drains are used to lower the seasonal high water table. Effectiveness of subsurface drainage is limited by landscape position of the soils.

Soils in group D are organic soils. Those in group D-1 are very deep and very poorly drained. They formed in organic material that is underlain with sandy deposits. Available water capacity is very high. Slopes range from 0 to 1 percent.

Soils in group E are shallow or very shallow and are well drained to poorly drained. These soils have bedrock between 4 and 20 inches that restricts rooting depth. These soils are droughty. Surface texture is loam. Available water capacity is very low or low. Slopes range from 0 to 12 percent.

Soils in group F have restricted root growth of climatically adapted plants to 20 to 40 inches. These soils will respond better to forages that do not have a tap root because of the moderately deep root zone. Those in group F-1 are moderately deep and well drained or moderately well drained. The HaA map unit is frequently flooded. Flooding limits these soils for pasture during periods of stream overflow and sediment lowers the quality of the forage. Surface texture is silt loam, loam, or loamy fine sand. Available water capacity is very low to moderate. These soils are droughty and will respond to warm season grasses such as switchgrass, big bluestem, indiangrass, and caucasin bluestem. These soils will respond favorably to additions of lime. Frequent applications may be needed to maintain an adequate pH level. The low pH of the subsoil of some soils will shorten the life of some deep rooted legumes in a stand. Slopes range from 0 to 6 percent.

Soils in group F-5 are very deep and moderately well drained. Surface texture is silty clay loam or silt loam. Available water capacity is low or moderate. A high clay content in the subsoil restricts the rooting depth of deep rooted forage plants. Shallow rooted species do best on these soils. These soils will respond better to forages

that do not have a tap root because of the limited root zone. Slopes range from 2 to 12 percent.

Soils in group F-7 are very deep and somewhat poorly drained or very poorly drained. Surface texture is loam or silty clay loam. Available water capacity is low or moderate. A high clay content in the subsoil restricts the rooting depth of deep rooted forage plants. Shallow rooted species do best on these soils. Subsurface drains are used to lower the seasonal high water table. Effectiveness of subsurface drainage is usually limited by permeability of the subsoil and the landscape position of the soil. These soils will respond better to forages that do not have a tap root because of the limited root zone. Slopes range from 0 to 6 percent.

The local office of the Natural Resources Conservation Service or Ohio State University Extension can provide information about forage yields.

Woodland Management and Productivity

Steve Siam, service forester, Ohio Department of Natural Resources, Division of Forestry, helped prepare this section.

Nearly all of Hancock County was forested at the time of the earliest land surveys. The climax forest community was dominantly beech forest in most of the county. The northern part of the county is within the Great Black Swamp Region of Ohio. This area was characterized by an elm-ash swamp forest community. Scattered remnants of other native plant communities exist in the county. These include the mixed oak forest community and the marshes and fens community (Gordon, 1966).

In 1985, about 21,800 acres, or 6.4 percent of the county, remained in woodland (Hancock Soil and Water Conservation District, 1995). Most of this acreage is in small scattered woodlots on slopes along stream valleys, on flood plains, and in isolated tracts on uplands. Most of the woodland has been cut over, and much of it has been grazed.

The return from the sale of wood products is smaller than that from the sale of other farm products on individual farms. However, if timber is competitively bid out, the maximum profit can be realized because of increased demand and changing markets for a variety of native hardwoods. The demand for high-quality oak and walnut is relatively stable, but new markets, such as elm veneer, are developing. The potential for increased production of timber is high. If managed well, woodlots are capable of producing high-quality, rapidly growing native hardwoods. Woodlots also provide firewood, lumber, edible nuts, wildlife habitat, esthetic value, and protection from winds.

Much of the woodland in the county is in need of some type of conservation treatment. Livestock grazing in the woodland and inadequate timber management are the major concerns. Stand improvement practices, such as culling diseased trees and the less desirable trees and cutting and spraying grapevines, improve the growth rate of favored species. Harvesting mature trees reduces competition from the less desirable trees and helps to prevent disease. When species are selected for planting on open ground, the slope and the type of soil should be considered. Planting is seldom necessary in established woods. Fencing livestock out of the woods and providing fire protection help to maintain good stands.

The soil properties at a specific site influence woodland management. Seedling species and survival rates, windthrow hazard, equipment limitations, and erosion potentials are management concerns that are influenced by the soil type. Water-holding capacity, internal drainage, and slope affect plant competition and seedling mortality. Surface texture, organic matter content, slope, and drainage influence logging schedules, equipment limitations, and damage sustained to the woodland environment during logging. Depth to the seasonal high water table or bedrock influence rooting depth which affects windthrow and site productivity.

Soil type and plant species are related. Soils that are susceptible to ponding for part of the year commonly support stands of soft maple, bur oak, swamp white oak, and pin oak. The somewhat poorly drained, poorly drained, and very poorly drained soils are best suited to hydrophytic species, such as sycamore, swamp white oak, American elm, and pin oak. Moderately well drained and well drained soils support a greater variety of tree species, such as white pine, red oak, white oak, ash, hickory, basswood, walnut, yellow-poplar, sugar maple, beech, and cherry.

Information on woodland management is available from the Ohio Department of Natural Resources, Division of Forestry; The Ohio State University Extension; and the Natural Resources Conservation Service.

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

Woodland Management

In tables 11, 13, and 14, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsuited indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00). Soils with no potential limitations (or soils with values less than 0.01) have a rating of low, slight, or as well suited and are not assigned a value in the tables.

Rating class terms for fire damage and seedling mortality are expressed as low, moderate, and high. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

For limitations affecting construction of haul roads and log landings, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of slight indicates that no significant limitations affect construction activities, moderate indicates that one or more limitations can cause some difficulty in construction, and severe indicates that one or more limitations can make construction very difficult or very costly.

Ratings in the column soil rutting hazard are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of slight indicates that the soil is subject to little or no rutting, moderate indicates that rutting is likely, and severe indicates that ruts form readily.

Ratings in the column erosion hazard are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of slight indicates that erosion is unlikely under ordinary climatic conditions; moderate indicates that some erosion is likely and that erosion-control measures may be needed; severe indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and very severe indicates that significant erosion

is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column suitability for roads (natural surface) are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column harvest equipment operability are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column suitability for site preparation are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column potential for damage to soil by fire are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Woodland Productivity

In table 12, 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 forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The volume of wood fiber, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Windbreaks and Environmental Plantings

Greg Maxfield, district forester, Ohio Department of Natural Resources, Division of Forestry, helped prepare this section.

In Hancock County, the importance of field windbreaks and environmental plantings is increasing. Many soils, such as Adrian, Arkport, Ottokee, Rimer, and Tuscola soils, are susceptible to wind erosion. These soils can be severely affected by southwesterly winds in the

spring. As a result, newly planted seeds may be left uncovered and small plants are damaged by blowing sand. Properly designed field windbreaks also reduce the amount of windblown soil that reaches drainage ditches on the farm.

Figure 13. The establishment of windbreaks perpendicular to the prevailing wind helps protect buildings.

Farm and homestead windbreaks are rows of trees or shrubs established adjacent to farm buildings, feedlots, and homes (fig. 13). These windbreaks are usually planted perpendicular to the prevailing winter wind. Planting multiple rows of various species provides the best protection from winds and results in more varied wildlife habitat.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 15 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 15 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service, The Ohio Department of Natural Resource, Division of Forestry, the Cooperative Extension Service, or from a commercial nursery.

Landscaping

In the urban areas of Hancock County, specifically Findlay and Fostoria, the soils have been disturbed by excavation and construction, and landscaping is possible only if special measures are taken to prepare the soil material for the plants. The soils closest to structures are most likely to be radically altered. This is especially true in complexes containing Urban land and in miscellaneous land areas, such as Aquents or Udorthents. Plants ordinarily will do well unless the soil has been severely altered physically or chemically. As many of the existing trees as possible should be left on the site during construction.

Home owners should consult local nurseryman, horticulturists, landscape designers, or extension agents for species that can be used. The 1972 U.S. Department of Agriculture Yearbook, "Landscape for Living" covers many aspects of landscaping in urban areas, especially the effects of pavement, heat, salts, shade, and microclimates.

The following factors also should be considered before plants for landscaping are selected:

Shade. Soils intermingled with Urban land, where the density of buildings is high, may be in shade much of the day, and plants on those soils do poorly unless they are shade tolerant. In areas of the urban land complexes, therefore, shade patterns should be observed before specimens are selected for planting.

Wetness. Some plants do not thrive in wet soils, such as Alvada or Pewamo soils. One way to overcome the wetness limitation is to install subsurface drainage if the soil is permeable enough for excess water to move through the disturbed soil and into the drain line. Another way is to bring in new soil and raise the plant beds to get a satisfactory rooting zone. Some low-lying areas are ponded by runoff from adjacent slopes. Diverting the runoff could solve this problem. In urban areas, alleviating wetness is sometimes difficult because property line restrictions limit the alternatives.

Restricted root zone. In some soils, the root zone is restricted by bedrock or a dense soil layer and usually does not hold enough water for plants throughout the growing season. If Biglick, Fox, Milton, and Oshtemo soils are severely graded during construction the underlying bedrock or sand and gravel in the substratum may become exposed or within a few inches of the surface. Most grading operations around homesites result in a greater degree of soil compaction than that in natural soils. The soils that have a root-restricting layer near the surface are also susceptible to frost action during freezing and thawing. If sloping, these soils may contribute sediment and surface runoff or seep water to driveways and walks, causing wet, messy conditions in warm weather and an ice hazard in winter. The thickness of a root zone can be increased by adding topsoil and by mixing organic matter into the surface layer of the soil. These practices also increase the available water capacity of the soil.

Gardening

William Lanning, Coordinator of the Hancock County Master Gardener Program, assisted in the preparation of this section.

The soils in this county are suited to many varieties of flowers and vegetables. Many of these plants have about the same soil requirements. This section discusses features of a good garden soil and the features that restrict the use of some soils. The 1977 U. S. Department of Agriculture Yearbook, "Gardening for Food and Fun" is a source of information on plant-soil-climate relationships, vegetable gardening, fruit and nut growing, and home food preservation.

The most favorable soil for a garden is nearly level or gently sloping, loamy and permeable. It is adequately aerated but has moderate or high available water capacity. It generally should be slightly acid or neutral (pH of 6.0 to 7.0). Many soils in Hancock County, especially those associated with building sites, have moderate or low organic matter content in the surface layer. Additions of organic matter for locally available sources, such as compost or leaves, will benefit flowers and vegetables, regardless of the kind of soil indicated by the soil map.

Many soils in the urban areas of Hancock County are slightly or severely disturbed by construction processes. Usually the closer a garden site is located to a building, the greater the possibility for soil disturbance during the construction process.

The undisturbed or slightly disturbed soils in Hancock County that are well suited to flower and vegetable gardens are the nearly level to gently sloping, well drained or moderately well drained, loamy soils. The Cygnet, Fox, Houcktown, Shawtown, Thackery, and Tuscola soils are examples.

The well and moderately well drained Flatrock, Knoxdale, Medway, and Rossburg soils are flood plain soils that are subject to occasional flooding. This flooding, however, occurs mostly in early spring, so that most vegetables can be grown without flood damage.

Most of the soils in Hancock County are very poorly drained or somewhat poorly drained. On these soils, wetness may delay planting by 2 to 4 weeks. Examples are the Blount, Del Rey, Fulton, Hoytville, Nappanee, Pewamo and Toledo soils.

A few soils in the county also have a high clay content in the surface layer that may restrict good seedbed preparation due to poor tilth. This can result in poor soil-seed contact and uneven germination rates. Examples of these soils are Hoytville and Nappanee, as well as eroded phases of Glynwood, Lucas, and Shinrock soils. Additions of organic matter help to improve tilth and soil structure.

Recreational Development

Hancock County has more recreational opportunities than many northwestern Ohio counties. The extensive Hancock County Park District, established in 1970, has a network of parks, hiking and bicycle trails, and nature preserves throughout the county. Many educational and other seasonal activities scheduled for the public are available during the calendar year. In addition, Van Buren State Park is open to the public for camping, fishing, hiking, and for other outdoor activities.

Findlay has several city parks and recreational facilities available for use by the public. There are also 10 village parks throughout the county which provide athletic fields, swimming pools, playground equipment, and shelter houses.

There are also many public and private golf courses throughout the county. Recreational areas are on a wide variety of soils; however several of the county and village parks make use of flood plains for seasonal outdoor opportunities.

The soils of the survey area are rated in tables 16 and 17 according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation 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, on-site assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 16 and 17 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

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 ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Jeff Burris, wildlife technician, Ohio Department of Natural Resources, Division of Wildlife, helped prepare this section.

The abundance and diversity of wildlife have declined in the intensively farmed counties in northwestern Ohio. As farmers have mechanized and as the acreage of corn and soybeans has increased, there are fewer acres of diversified crops, fence rows, and stream banks lined with woody vegetation. Such areas provide good habitat for wildlife. Fall plowing of cropland destroys the food and cover needed by wildlife to survive the winter. Suitable habitat is the single most important factor determining the existence of a diverse wildlife population. The types of wildlife habitat that occur in Hancock County include wetland, grassland, woodland, cropland, and riparian habitat.

Figure 14. Included in Pewamo map units are undrained wooded areas which provide habitat for wetland and woodland wildlife species.

Wetland habitat (fig. 14) offers shelter for migratory waterfowl, shore birds, songbirds, amphibians, reptiles, and mammals. Wetlands also produce invertebrates and plants that are important foods for game and nongame species. These wetlands also act as pollution filters and floodwater storage basins and provide erosion control.

Grassland habitats generally provide valuable nesting cover. They also furnish food in the form of seed and succulent green plant parts.

Woodland habitats in the county have been altered by conversion to cropland, overgrazing, residential and industrial development, and commercial timber harvest. Forest lands in the county consist of small woodland "islands" and occur as corridors along streams. These corridors and islands are surrounded by large expanses of cropland.

Cropland habitat is seasonal and is therefore transitory in nature. Cropland provides some food and shelter for wildlife. Moldboard plowing

reduces the amount of quality habitat available for resident species. More and more cropland is being cultivated by the no-till method, which leaves the crop residue on the soil surface. This provides shelter and some food for wildlife during the winter months. Fence rows along field boundaries also provide shelter for wildlife species. Marginal cropland that has been converted to wildlife habitat under provisions of the 1985 Farm Bill has increased the amount of available habitat for game and nongame species.

Figure 15. Riparian habitat on Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded.

Stream corridors or riparian habitat consists of the land and corresponding vegetation along the bank of a watercourse (fig. 15). Riparian habitat is one of the richest and most diverse habitat types in Hancock County. Riparian buffer zones provide many important benefits. They help to maintain high water quality and improve the habitat for a diverse population of wildlife. The quality of streams and rivers has declined because their natural characteristics have been altered. Tillage and drainage of the land combined with the loss of forested buffer zones have caused watercourses to become wider, shallower, and more turbid.

If they are properly managed, all of the soils in Hancock County can provide the habitat elements needed for wildlife. Incorporating openland, wetland, and woodland wildlife habitat principles into current agricultural practices can increase the quantity and quality of wildlife habitat in the county. Additional information about the development of wildlife habitat can be obtained from the local game protector and the local office of Ohio State University Extension or the Natural Resources Conservation Service.

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 18, 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 soybeans.

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, 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 Queen Anne's lace, goldenrod, common teasel, lamb's-quarters, and yarrow.

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 raspberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, 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, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, and mink.

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 between the surface and a depth of 5 to 7 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 on-site 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 particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, 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 on-site 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.

Construction Materials

Tables 19 and 20 give information about the soils as potential sources of gravel, sand, topsoil, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

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 19, only the likelihood 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 Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated good, fair, or poor as potential sources of sand and gravel. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. The thickest layer is the thickest layer above the bottom layer. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is an unlikely source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated good, fair, or poor as potential sources of topsoil and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil or roadfill. The lower the number, the greater the limitation.

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. The ratings are based on the soil properties that affect plant

growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

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.

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 whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a 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 AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 21 and 22 show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil

properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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 soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing. All soils, especially when at or near saturation, have the potential to slough, and cutbanks are susceptible to caving. Care should always be taken when making excavations.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Tables 23 and 24 show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low

maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

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. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, 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. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A trench sanitary landfill is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, on-site investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground- water pollution. Slope affects construction of the trenches and the movement of surface water

around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an area sanitary landfill, solid 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. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

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. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

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. It should not have excess sodium, salts, or lime and should not be too acid.

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 25 shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly

ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are generally favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to

90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Water Management

Tables 26 and 27 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.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

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 (fig. 16). 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.

Figure 16. Glynwood soils are good sites for pond reservoirs.

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 on-site 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, a cemented pan, or 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 a cemented pan, large stones, slope, and the hazard of cutbanks caving. 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 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 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 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 on file at the School of Natural Resources, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the USDA-Natural Resources Conservation Service state office, Columbus, Ohio.

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 28 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.

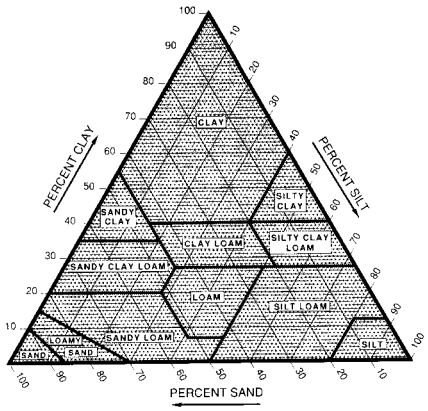

Figure 17. Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 17). "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.

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 29 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 29, 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 (Ksat) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). 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.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are low, a change of less than 3 percent; moderate, 3 to 6 percent; high, more than 6 percent; and very high, greater than 9 percent.

Erosion factors are shown in table 29 as the K factor (Kw and Kf) 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 six 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 30 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.

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.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 30, 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.

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.

Water Features

Table 31 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 31 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. Water table data in table 31 reflects drained conditions. A saturated zone that lasts for less than a month is not considered a water table.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. An artesian water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

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 31 indicates surface water depth and the duration and frequency of ponding. Ponding data in table 31 reflects drained conditions. 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.

Individual delineations of some map units in the county are rarely flooded. These delineations are identified in the "Contrasting Components" section of the map unit descriptions. When these areas are identified in the Contrasting components section, local Federal Emergency Management Agency flood plain maps should be consulted to determine if the delineation lies within the 100 year flood plain. For an example, refer to AkA or AmA map unit descriptions.

Soil Features

Table 32 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.

Physical and Chemical Analyses of Selected Soils

Many of the soils in Hancock County were sampled by the Soil Characterization Laboratory, School of Natural Resources, The Ohio State University, Columbus, Ohio. The physical and chemical data obtained from the samples include particle size distribution, reaction, organic matter content, calcium carbonate content, and extractable cations.

These data were used in classifying and correlating soils and in evaluating their behavior under various land uses. Seven pedons were

selected as representative of the respective series and are described in the section titled "Soil Series and Their Morphology." These series and their laboratory identification numbers are: HK-20 Vaughnsville; HK-34 Biglick; HK-43 Glynwood: HK-44; Aurand; HK-45 Lamberjack; HK-46 Houcktown; HK-47 Mortimer.

In addition to the data from Hancock County, laboratory data are available from nearby or adjacent counties that have many of the same soils. These datasets and the data from Hancock County are on file at the School of Natural Resources, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the USDA-Natural Resources Conservation Service state office, Columbus, Ohio.

Engineering Index Test Data

Engineering index test data are available for several pedons from Hancock County. Additional engineering index test data is also available from several nearby counties that have many of the same soils as Hancock County. These soils were analyzed for engineering properties by the Ohio Department of Transportation, Division of Highways, Bureau of Testing, Soils and Foundation Section. The available test data are on file at the MLRA Project Office, Findlay, Ohio; the School of Natural Resources, The Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975 and 1994). 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 33 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.

Figure 18. Profile of an Arkport soil. The dark yellowish brown lamellae (banding) in the subsoil is a horizontal accumulation of clay. Depth marked in feet.

Figure 19. Profile of a Fox soil. The dark yellowish brown subsoil tongues into the sandy and gravelly substratum. Depth marked in feet.

Figure 20. Profile of a Houcktown soil. The darker colored loamy layer at about 2 feet marks the irregular boundary between the loamy sediments and underlying till. Depth marked in feet.

Figure 21. Profile of a Medway soil. An apparent seasonal high water table is present in the subsoil during the months of December to April. Depth marked in feet.

Figure 22. Profile of a Pewamo soil. Organic matter darkens the surface color and the reduction of iron is responsible for the gray colors in the subsoil. Depth marked in feet.

Figure 23. Profile of a Rimer soil. This somewhat poorly drained soil formed in sandy glaciolacustrine material and in the underlying till. Depth marked in feet.

Figure 24. Profile of a Vaughnsville soil.
The brownish and reddish colors of the upper part of the subsoil are the result of iron oxidation. The grayish color in the subsoil below 2 feet is the result of iron reduction. Depth marked in feet.

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. Pedons used in this publication were primarily described and documented as part of the Hancock County modernization process. In certain circumstances, pedons from adjacent survey areas or from the site of the official series description (OSD) were utilized. In most cases, typical pedons from adjacent survey areas were used to provide consistent supporting data and documentation across survey area boundaries. In the case of OSD's, it was to transition toward the use of official series descriptions as part of a nationwide trend in soil survey publications. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975) and in "Keys to Soil Taxonomy" (USDA, 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.

Adrian Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow to moderately rapid in the organic material and rapid in the underlying sandy deposits
Parent material: Herbaceous organic material and the underlying sandy deposits
Landform: Depressions on outwash plains
Slope: 0 to 1 percent

Adjacent soils: Colwood, Gilford, Westland

Taxonomic class: Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists

Typical Pedon
Adrian muck, 0 to 1 percent slopes, about 2.5 miles northeast of Vanlue, in Biglick Township, about 2040 feet west and 960 feet south of the northeast corner of sec. 26, T. 1 N., R. 12 E.

Oap=0 to 11 inches; black (10YR 2/1) muck (sapric material), very dark gray (10YR 3/1) dry; about 10 percent fiber, less than 5 percent rubbed; weak fine and medium granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Oa1=11 to 17 inches; black (5YR 2.5/1) muck (sapric material); about 20 percent fiber, less than 10 percent rubbed; weak medium and coarse subangular blocky structure; very friable; common fine roots; strongly acid; gradual wavy boundary.

Oa2=17 to 23 inches; dark reddish brown (5YR 2.5/2) muck (sapric material); about 15 percent fiber, less than 5 percent rubbed; weak medium and coarse subangular blocky structure; very friable; common fine roots; common distinct reddish brown (5YR 4/4) streaks of ferrihydrite in old root channels; strongly acid; clear wavy boundary.

Oa3=23 to 26 inches; dark reddish brown (5YR 2.5/2) muck (sapric material); about 15 percent fiber, less than 10 percent rubbed; weak medium and coarse subangular blocky structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

Cg1=26 to 32 inches; dark gray (10YR 4/1) loamy sand; single grain; loose; few fine roots; few faint very dark gray (10YR 3/1) organic stains coating sand grains; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent rock fragments; slightly acid; gradual wavy boundary.

Cg2=32 to 80 inches; gray (10YR 5/1) sand with strata of fine sandy loam, loamy fine sand, loamy sand, and loamy coarse sand; single grain; loose; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the organic material: 16 to 51 inches
Depth to bedrock: Greater than 80 inches

Oa horizon:
Color=hue of 10YR, 7.5YR, or 5YR, or is neutral, value of 2, 2.5, or 3, chroma of 0 to 2
Texture=muck (sapric material)

C or Cg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 3 to 6, chroma of 1 to 4
Texture=sand, fine sand, loamy sand, or loamy coarse sand, or the gravelly analogues of those textures; some pedons have strata of sandy loam or loamy fine sand
Content of rock fragments=0 to 25 percent

Alvada Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the

solum, and moderately slow or slow in the substratum
Parent material: Loamy and gravelly deposits overlying till
Landform: Depressions and drainageways on outwash plains, ground moraines, end moraines, and lake plains
Slope: 0 to 2 percent

Adjacent soils: Lamberjack, Thackery

Taxonomic class: Fine-loamy, mixed, mesic Typic Argiaquolls

Typical Pedon
Alvada loam, 0 to 1 percent slopes, about 4.5 miles east of Findlay, in Marion Township, about 200 feet north and 760 feet west of the southeast corner of sec. 14, T. 1 N., R. 11 E.

Ap=0 to 10 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; 3 percent rock fragments; neutral; clear smooth boundary.

Btg1=10 to 16 inches; dark gray (10YR 4/1) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few fine and medium prominent (7.5YR 5/6) and common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; neutral; gradual wavy boundary.

Btg2=16 to 21 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) masses of iron accumulation in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) and common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; neutral; clear wavy boundary.

Btg3=21 to 28 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation and common fine and medium distinct dark yellowish brown (10YR 4/4) in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 4 percent rock fragments; neutral; gradual wavy boundary.

Bt=28 to 39 inches; brown (10YR 5/3) loam with thin strata of sandy loam; weak medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; common medium and coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine and medium prominent strong brown (7.5YR 5/6) and common medium and coarse faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 10 percent rock fragments; slightly effervescent; slightly alkaline; abrupt irregular boundary.

B'tg=39 to 46 inches; grayish brown (10YR 5/2) gravelly loam with thin strata of fine sandy loam and strata of silty clay loam; weak medium and coarse subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds and bridging sand grains; few medium prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 20 percent rock fragments; strongly effervescent; slightly alkaline; abrupt wavy boundary.

BCg=46 to 50 inches; gray (10YR 5/1) very gravelly sandy loam; weak medium and coarse subangular blocky structure; very friable; few medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 35 percent rock fragments; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C=50 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; firm; few medium distinct grayish brown (10YR 5/2) iron depletions oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 35 to 55 inches
Depth to carbonates: 24 to 55 inches
Depth to till: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 2 or 3, chroma of 0 to 2
Texture=loam
Content of rock fragments=0 to 10 percent

Btg and Bt horizons:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 or 2; includes chroma of 3 in the lower part
Texture=clay loam, loam, or sandy clay loam, or the gravelly analogues of those textures
Content of rock fragments=2 to 25 percent

2C or 2Cg horizon:

Color=hue of 10YR, value of 4 or 5, chroma of 1 to 6
Texture=clay loam, silty clay loam, or loam
Content of rock fragments=1 to 7 percent

Arkport Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Sandy eolian deposits
Landform: Dunes, beach ridges
Position on the landform: Shoulders, summits, backslopes
Slope: 2 to 6 percent

Adjacent soils: Rensselaer, Rimer

Taxonomic class: Coarse-loamy, mixed, active mesic Lamellic Hapludalfs

Typical Pedon
Arkport loamy fine sand, 2 to 6 percent slopes, about 4 miles west of Bluffton, in Allen County, Ohio, Richland Township, about 250 feet west and 940 feet north of the southeast corner of sec. 6, T. 2 S., R. 8 E.

Ap=0 to 10 inches; dark brown (10YR 3/3) loamy fine sand, light brownish gray (10YR 6/2) dry; weak medium granular structure; very friable; common very fine roots; few fine distinct black (10YR 2/1) moderately cemented manganese oxide concretions throughout; slightly acid; abrupt wavy boundary.

BE=10 to 18 inches; brown (10YR 5/3) loamy fine sand; weak medium subangular blocky structure; very friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) organic coatings bridging sand grains; few fine distinct black (10YR 2/1) moderately cemented manganese oxide concretions throughout; neutral; abrupt wavy boundary.

E and Bt=18 to 65 inches; light yellowish brown (10YR 6/4) loamy fine sand E material intricately patterned with dark yellowish brown (10YR 4/4) fine sandy loam lamellae and bands (Bt material) that are roughly horizontal in orientation; individual lamellae and bands range from 1/8 to 6 inches thick with total thickness of about 16 inches in the horizon; weak coarse subangular blocky structure parting to weak fine granular in the E material; moderate coarse subangular blocky structure parting to moderate fine and medium angular in the Bt material; very friable; few very fine roots; neutral; clear wavy boundary.

C1=65 to 84 inches; light yellowish brown (10YR 6/4) fine sand; single grain; loose; very few very fine roots; few moderate and coarse distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; strongly effervescent; slightly alkaline; gradual smooth boundary.

C2=84 to 100 inches; light yellowish brown (10YR 6/4) fine sand; single grain; loose; strongly effervescent; slightly alkaline.

Range in Characteristics
Depth to the uppermost lamellae: 9 to 30 inches
Thickness of the solum: 40 to 100 inches
Depth to carbonates: 36 to 120 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 7.5YR, value of 3 or 4, chroma of 2 or 3
Texture=loamy fine sand

BE or E horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 3 to 6
Texture=loamy fine sand

E and Bt horizon:
Color of E horizon=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 4
Color of Bt horizon=hue of 10YR, 7.5YR, or 5YR, value of 3 to 5, chroma of 3 to 6
Texture=E part: loamy fine sand, fine sand, or loamy very fine sand; Bt part: fine sandy loam or very fine sandy loam

C horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 4
Texture=sand, fine sand, loamy fine sand, very fine sand, or loamy very fine sand
Content of rock fragments=0 to 10 percent

Aurand Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Rises and flats on beach ridges and lake plains
Position on the landform: Footslopes on beach ridges; summits on lake plains
Slope: 0 to 2 percent

Adjacent soils:
On beach ridges=Fox, Oshtemo, Shawtown
On lake plains=Hoytville, Mermill, Pewamo

Taxonomic class: Fine-loamy, mixed, mesic Aquic Argiudolls

Typical Pedon
Aurand loam, 0 to 2 percent slopes, about 1.2 miles east of McComb, in Portage Township, about 800 feet north and 540 feet east of the southwest corner of sec. 19, T. 2 N., R. 10 E.

Ap=0 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=11 to 17 inches; brown (10YR 4/3) clay loam; moderate fine and very fine subangular blocky structure; friable; common fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine and medium prominent strong brown (7.5YR 5/6) and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bt2=17 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly alkaline; clear wavy boundary.

Bt3=22 to 29 inches; yellowish brown (10YR 5/4) loam with thin strata of sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly alkaline; clear wavy boundary.

Btg=29 to 33 inches; grayish brown (10YR 5/2) silty clay loam with thin strata of sandy loam and loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; abrupt wavy boundary.

2BC=33 to 48 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common distinct light gray (10YR 7/1) calcium carbonate coatings on vertical faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

2Cd=48 to 62 inches; brown (10YR 4/3) silty clay loam; massive, with widely spaced vertical fractures; very firm; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2Cdg=62 to 80 inches; dark gray (10YR 4/1) silty clay loam; massive, with widely spaced vertical fractures; very firm; common fine and medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 25 to 50 inches
Depth to till: 20 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 2, 2.5, or 3, chroma of 0 to 2
Texture=loam
Content of rock fragments=0 to 10 percent

Bt and Btg horizons:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture=loam, clay loam, sandy clay loam, or silty clay loam, with strata of fine sandy loam, loamy fine sand, sandy loam, loam, or loamy sand, or the gravelly analogues of those textures
Content of rock fragments=0 to 20 percent

2BCg, 2BC, 2Cd, and 2Cdg horizons:
Color=hue of 10YR or 2.5Y, or is neutral, value of 4 or 5, chroma of 0 to 4
Texture=clay loam, silty clay loam, or clay

Content of rock fragments=1 to 7 percent

Biglick Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow or slow
Parent material: Thin layer of drift over clayey residuum from limestone or dolostone
Landform: Flats, rises, and knolls on monadnocks on ground moraines
Position on the landform: Shoulders, summits, backslopes
Slope: 0 to 12 percent

Adjacent soils: Channahon, Milton, Morley

Taxonomic class: Clayey, illitic, mesic Lithic Hapludalfs

Typical Pedon
Biglick loam, from an area of Biglick-Milton complex, 0 to 2 percent slopes, about 2.75 miles northeast of Vanlue, in Biglick Township, about 2340 feet north and 620 feet east of the southwest corner of sec. 36, T. 1 N., R. 12 E.

Ap=0 to 10 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine and few medium roots; 2 percent igneous pebbles; slightly alkaline; abrupt smooth boundary.

2Bt=10 to 14 inches; brown (7.5YR 4/4) clay; strong fine and medium subangular blocky structure; firm; common fine roots; many distinct dark brown (10YR 3/4) clay films on faces of peds; 7 percent weathered limestone fragments; slightly alkaline; abrupt irregular boundary.

2R=14 to 16 inches; fractured limestone with solution cavities extending to a depth of 27 inches, that have filled with dark yellowish brown (10YR 4/4) fine sandy loam.

Range in Characteristics

Thickness of the solum: 10 to 20 inches
Depth to bedrock: 10 to 20 inches

Ap horizon:
Color=hue of 10YR or 7.5Y, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 7 percent

2Bt horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture=clay, silty clay, or clay loam
Content of rock fragments=2 to 14 percent

Blount Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow in the solum and slow or very slow in the substratum
Parent material: Till
Landform: Flats, rises, and knolls on end moraines, ground moraines, and disintegration moraines
Position on the landform: Shoulders, summits, backslopes
Slope: 0 to 4 percent

Adjacent soils: Del Rey, Glynwood, Houcktown, Jenera, Pewamo

Taxonomic class: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon
Blount silt loam, 0 to 2 percent slopes, about 1.5 miles east-northeast of Houcktown, in Jackson Township; about 2375 feet south and 1910 feet west of the northeast corner of sec. 23 T. 1 S., R. 11 E.

Ap=0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; few coarse and common fine and medium roots; 10 percent intermixing of brown (10YR 5/3) BE material; 1 percent rock fragments; strongly acid; clear smooth boundary.

BE=9 to 13 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few medium and coarse and common fine roots; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common faint light brownish gray (10YR 6/2) clay depletions on faces of peds and in pores; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; strongly acid; clear wavy boundary.

Btg1=13 to 21 inches; dark grayish brown (10YR 4/2) silty clay; strong medium subangular blocky structure; firm; few medium and coarse and common fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) and distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few faint light brownish gray (10YR 6/2) clay depletions on faces of peds; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation

on faces of peds; 2 percent rock fragments; slightly acid; gradual wavy boundary.

Btg2=21 to 29 inches; grayish brown (10YR 5/2) silty clay; moderate medium subangular blocky structure; firm; common fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) and distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; slightly effervescent discontinuously in the matrix; neutral; gradual wavy boundary.

Bt1=29 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; common distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on faces of peds; few distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 4 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

Bt2=34 to 43 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on faces of peds; common medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

BC=43 to 55 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; very firm; few distinct grayish brown (10YR 5/2) coatings on vertical faces of prisms; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on vertical faces of prisms; common medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline; clear irregular boundary.

Cd=55 to 80 inches; dark yellowish brown (10YR 4/4) clay loam; massive, with widely spaced vertical fractures; very firm; few medium distinct grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation along fractures; few distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on vertical faces of fractures; 6 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 30 to 60 inches
Depth to carbonates: 19 to 40 inches
Depth to dense material: 30 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 1 to 3
Texture=silt loam or loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay loam, clay loam, silty clay, or clay
Content of rock fragments=2 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 4
Texture=silty clay loam or clay loam
Content of rock fragments=5 to 15 percent

Channahon Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Parent material: Loamy drift over limestone or dolostone
Landform: Monadnocks on ground moraines
Position on the landform: Backslopes, shoulders
Slope: 6 to 12 percent

Adjacent soils: Biglick, Milton

Taxonomic class: Loamy, mixed, mesic Lithic Argiudolls
Typical Pedon
Channahon loam, from an area of Channahon-Biglick complex, 6 to 12 percent slopes, about 1.5 miles northeast of Vanlue, in Biglick Township, about 1280 feet west and 2580 feet south of the northeast corner of sec. 34, T. 1 N., R. 12 E.

Ap=0 to 7 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; many fine and common medium roots; 5 percent rock fragments; slightly alkaline; abrupt smooth boundary.

Bt1=7 to 11 inches; dark yellowish brown (10YR 4/4) channery loam; weak medium subangular blocky structure; friable; few fine and medium roots; few distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; 17 percent rock fragments; slightly alkaline; clear wavy boundary.

Bt2=11 to 13 inches; dark yellowish brown (10YR 4/4) channery loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; 30 percent rock fragments; slightly alkaline; abrupt wavy boundary.

2R=13 to 15 inches; fractured light gray (10YR 7/2) limestone.

Range in Characteristics

Thickness of the mollic epipedon: 6 to 9 inches
Thickness of the solum: 10 to 20 inches
Depth to bedrock: 10 to 20 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=loam
Content of rock fragments=0 to 15 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture=channery loam or channery clay loam
Content of rock fragments=15 to 30 percent

Colwood Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate or moderately slow in the solum and moderate in the substratum
Parent material: Stratified glaciolacustrine deposits
Landform: Flats, depressions, and drainageways on lake plains
Slope: 0 to 1 percent

Adjacent soils: Darroch, Tuscola

Taxonomic class: Fine-loamy, mixed, mesic Typic Endoaquolls

Typical Pedon
Colwood loam, 0 to 1 percent slopes, about 2.5 miles northwest of Benton Ridge, in Blanchard Township, about 1420 feet south and 2540 feet west of the northeast corner of sec. 15, T. 1 N., R. 9 E.

Ap=0 to 8 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

A=8 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; common fine roots; neutral; clear smooth boundary.

Bg1=11 to 19 inches; dark gray (10YR 4/1) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common fine and medium distinct dark yellowish brown (10YR 4/4) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Bg2=19 to 30 inches; dark grayish brown (10YR 4/2) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common fine and medium distinct dark yellowish brown (10YR 4/4) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bg3=30 to 38 inches; grayish brown (10YR 5/2) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) coatings on faces of peds; common medium prominent strong brown (7.5YR 5/6) and many medium and coarse distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bg4=38 to 48 inches; grayish brown (10YR 5/2) loam with thin strata of fine sandy loam and silty clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint gray (10YR 5/1) coatings on faces of peds; common medium prominent strong brown (7.5YR 5/6) and many coarse distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Bg5=48 to 56 inches; grayish brown (10YR 5/2) fine sandy loam with thin strata of loam and silt loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint gray (10YR 5/1) coatings on vertical faces of peds; common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; slightly alkaline; gradual wavy boundary.

Cg=56 to 80 inches; grayish brown (2.5Y 5/2) silt loam with strata of very fine sand; massive; friable; common medium faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 19 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap or A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=loam

Bg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture=loam, clay loam, sandy clay loam, fine sandy loam, sandy loam, silty clay loam, or silt loam

Cg horizon:
Color=hue of 10YR, 2.5Y or 5Y, value of 4 to 6, chroma of 1 or 2
Texture=silt loam, fine sand, or very fine sand, and is commonly stratified

Cygnet Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum, moderately rapid in the lower part of the solum and in the upper part of the substratum, and slow or very slow in the lower part of the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Rises on beach ridges and longshore bars on lake plains
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent

Adjacent soils: Fox, Shawtown

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Cygnet loam from an area of Cygnet loam, 0 to 3 percent slopes, about 1.5 miles west-northwest of Gomer, in Allen County, Ohio, Sugar Creek Township, about 2620 feet east and 1020 feet north of the southwest corner of sec. 19, T. 2 S., R. 6 E.

Ap1=0 to 4 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; friable; common fine and very fine roots; 5 percent rock fragments; slightly acid; clear smooth boundary.

Ap2=4 to 12 inches; dark grayish brown (10YR 4/2) loam, very pale brown (10YR 7/3) dry; weak medium subangular blocky structure; friable; common fine and very fine roots; 5 percent intermixing of yellowish brown (10YR 5/4) Bt1 material; common faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine and medium prominent strong brown (7.5YR 5/8) rounded masses of iron accumulation in the matrix; 4 percent rock fragments; strongly acid; abrupt wavy boundary.

Bt1=12 to 19 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; common fine and very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common faint brown (10YR 5/3) clay depletions on faces of peds; few distinct black (10YR 2/1) masses of manganese oxide accumulation in the matrix; 4 percent rock fragments; strongly acid; clear wavy boundary.

Bt2=19 to 27 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; common fine and very fine roots; common distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; few faint dark yellowish brown (10YR 4/4) clay films on vertical faces of peds; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common medium distinct gray (10YR 5/1) iron depletions in the matrix; few distinct black (10YR 2/1) masses of manganese oxide accumulation on faces of peds; 3 percent rock fragments; strongly acid; clear smooth boundary.

Bt3=27 to 36 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; friable; common fine and very fine roots; few faint brown (10YR 5/3) clay films on vertical faces of peds; many distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; common medium prominent strong brown (7.5YR 5/8) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 5/1) iron depletions in the matrix; few distinct black (10YR 2/1) masses of manganese oxide accumulation on faces of peds; common medium distinct black (10YR 2/1) rounded masses of manganese oxide accumulation in the matrix; 3 percent rock fragments; moderately acid; gradual wavy boundary.

Bt4=36 to 45 inches; dark yellowish brown (10YR 4/4) clay loam with thin strata of brown (10YR 4/3) sandy clay loam; moderate fine and medium subangular blocky structure; friable, and very friable in the sandy clay

loam strata; common fine and very fine roots; common distinct grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct dark brown (10YR 3/3) clay bridging in the sandy clay loam strata; common fine distinct yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 3 percent rock fragments; neutral; clear wavy boundary.

Bt5=45 to 50 inches; yellowish brown (10YR 5/4) sandy clay loam; moderate medium and coarse subangular blocky structure; friable; pockets of dark brown (10YR 3/3) loam; few fine and very fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds and dark grayish brown (10YR 4/2) clay films in root channels and pores; many distinct very dark grayish brown (10YR 3/2) clay bridging in the pockets of loam; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; neutral; abrupt smooth boundary.

2BC=50 to 56 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium and coarse subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common distinct yellowish brown (10YR 5/6) hypocoats along the light brownish gray (10YR 6/2) carbonate coatings on vertical faces of peds; 2 percent rock fragments; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2Cd1=56 to 68 inches; brown (10YR 5/3) silty clay; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 5/1) carbonate coatings on faces of fractures; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd2=68 to 80 inches; brown (10YR 5/3) silty clay loam; massive; very firm; 2 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 33 to 60 inches
Depth to carbonates: 33 to 60 inches
Depth to till: 40 to 60 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 15 percent

Bt or Btg horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6; includes chroma of 2 in the lower part
Texture=clay loam, sandy clay loam, loam, or sandy loam, or the gravelly analogues of those textures
Content of rock fragments=0 to 30 percent

C or Cg horizon (where present):
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=loamy coarse sand, loamy sand, sandy loam, or loam, or the gravelly analogues of those textures
Content of rock fragments=0 to 30 percent

2Cd or 2Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=silty clay loam, clay loam, or silty clay
Content of rock fragments=1 to 7 percent

Darroch Series

Depth Class: Very deep
Drainage Class: Somewhat poorly drained
Permeability: Moderate
Parent material: Stratified loamy and silty deposits
Landform: Rises and flats on lake plains and outwash plains
Position on the landform: Summits
Slope: 0 to 2 percent

Adjacent soils: Colwood, Tuscola

Taxonomic class: Fine-loamy, mixed, mesic Aquic Argiudolls

Typical Pedon:
Darroch loam, 0 to 2 percent slopes, about 2 miles northwest of Benton Ridge, in Blanchard Township, about 840 feet east and 2050 feet south of the northwest corner of sec. 23, T. 1 N., R. 9 E.

Ap=0 to 11 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=11 to 15 inches; brown (10YR 5/3) clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bt2=15 to 26 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Btg=26 to 30 inches; grayish brown (2.5Y 5/2) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; many fine and medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

B't1=30 to 34 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and as bridging between sand grains; common fine and medium distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

B't2=34 to 44 inches; brown (10YR 5/3) loam; weak medium and coarse subangular blocky structure; friable; common faint grayish brown (10YR 5/2) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Cg=44 to 80 inches; grayish brown (10YR 5/2) silt loam with many thin strata of very fine sandy loam; massive; friable; common medium distinct yellowish brown (10YR 5/4) and few medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine and medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=loam
Content of rock fragments=0 to 3 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture=loam, clay loam, silty clay loam, or silt loam in the upper part; and sandy clay loam, loam, fine sandy loam, or sandy loam in the lower part
Content of rock fragments=0 to 3 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 5 or 6, chroma of 1 to 6
Texture=silt loam or loam, and is commonly stratified
Content of rock fragments=0 to 15 percent

Del Rey Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Glaciolacustrine deposits
Landform: Flats and rises on lake plains and disintegration moraines
Position on the landform: Summits, shoulders
Slope: 0 to 3 percent

Adjacent soils:
On disintegration moraines=Blount, Pewamo
On lake plains=Patton, Shinrock, Tuscola

Taxonomic class: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon
Del Rey silt loam, 0 to 2 percent slopes, about 4 miles northwest of Benton Ridge, in Blanchard Township, about 420 feet west and 1500 feet north of the southeast corner of sec. 18, T. 1 N., R. 9 E.

Ap=0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; 5 percent intermixing of Bt1 material; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear smooth boundary.

Bt1=10 to 16 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt2=16 to 23 inches; yellowish brown (10YR 5/4) silty clay; moderate medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt3=23 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear wavy boundary.

Bt4=29 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; slightly effervescent discontinuously in the matrix; slightly alkaline; gradual wavy boundary.

Bt5=37 to 52 inches; yellowish brown (10YR 5/4) silt loam with strata of silty clay loam; weak medium subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on vertical faces of peds; few medium distinct light gray (10YR 7/2) calcium carbonate nodules in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=52 to 60 inches; dark yellowish brown (10YR 4/4) silty clay loam with strata of silt loam; weak medium and coarse subangular blocky structure; firm; common distinct gray (10YR 6/1) coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on vertical faces of peds; few medium distinct light gray (10YR 7/2) calcium carbonate nodules in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

C=60 to 80 inches; dark yellowish brown (10YR 4/4) silty clay loam with strata of silt loam; massive, with widely spaced vertical fractures; firm; common distinct gray (10YR 5/1) coatings on faces of fractures; common fine and medium distinct gray (10YR 6/1) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of fractures; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 45 to 60 inches
Depth to carbonates: 22 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 1 or 2
Texture=silt loam

Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture=silty clay loam or silty clay, and grades to silt loam in the lower part

C horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture=silt loam or silty clay loam, and is commonly stratified

Dunbridge Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Loamy drift overlying limestone or dolostone
Landform: Rises and knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 1 to 4 percent

Adjacent soils: Millsdale, Milton, Morley

Taxonomic class: Fine-loamy, mixed, mesic Mollic Hapludalfs

Typical Pedon

Dunbridge loamy fine sand, 0 to 2 percent slopes, about 2.5 miles east of Luckey, in Wood County, Ohio, Troy Township, about 2470 feet south and 660 feet west of the northeast corner of section 26, T. 6 N., R. 12 E.

Ap=0 to 8 inches; dark brown (10YR 3/3) loamy fine sand, brown (10YR 5/3) dry; weak fine granular structure; very friable; few rock fragments; slightly acid; abrupt smooth boundary.

BA=8 to 14 inches; yellowish brown (10YR 5/4) fine sandy loam; very weak fine subangular blocky structure; friable; few rock fragments; slightly acid; clear smooth boundary.

Bt=14 to 26 inches; dark brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm; common faint dark brown (7.5YR 4/4) clay films on faces of peds and bridging sand grains; common weathered limestone fragments; common igneous cobblestones and pebbles; neutral; abrupt wavy boundary.

2C=26 to 28 inches; pale brown (10YR 6/3) extremely cobbly loam; massive; friable; 85 percent rock fragments less than 3 inches in diameter; slightly effervescent; slightly alkaline; abrupt wavy boundary.

2R=28 to 30 inches; pale brown (10YR 6/3) limestone.

Range in Characteristics

Thickness of the dark colored epipedon: 6 to 9 inches
Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=loamy fine sand
Content of rock fragments=1 to 5 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture=fine sandy loam, sandy loam, sandy clay loam, clay loam, or loam, or the gravelly analogues of those textures
Content of rock fragments=1 to 35 percent

2C horizon (where present):
Color=hue of 10YR or 7.5YR, value of 5 to 7, chroma of 2 to 4
Texture=loam, sandy clay loam, or clay loam, or the cobbly, very cobbly, or extremely cobbly analogues of those textures
Content of rock fragments=15 to 90 percent.

Elliott Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part of the solum and slow or moderately slow in the lower part of the solum and in the substratum
Parent material: Till
Landform: Rises on lake plains
Position on the landform: Summits
Slope: 0 to 2 percent

Adjacent soils: Pewamo

Taxonomic class: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon
Elliott silt loam, 0 to 2 percent slopes, about 1.75 miles southwest of Benton Ridge, in Union Township, about 2460 feet east and 540 feet south of the northwest corner of sec. 4, T. 1 S., R. 9 E.

Ap=0 to 12 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; common fine roots; 1 percent rock fragments; neutral; clear smooth boundary.

BA=12 to 16 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; firm; common fine roots; common fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Bt1=16 to 23 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common fine and medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; neutral; clear irregular boundary.

Bt2=23 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the

matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 4 percent rock fragments; slightly effervescent discontinuously in the matrix; neutral; gradual wavy boundary.

Bt3=30 to 36 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 4 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; gradual wavy boundary.

BC=36 to 50 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and coarse subangular blocky structure; very firm; few fine roots in the upper part; common distinct gray (10YR 5/1) coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

Cd=50 to 80 inches; dark yellowish brown (10YR 4/4) clay loam; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 5/1) coatings on faces of fractures; common fine and medium distinct gray (10YR 5/1) iron depletions; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the solum: 32 to 55 inches
Depth to carbonates: 17 to 40 inches
Depth to dense material: 32 to 55 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=silt loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=silty clay loam, silty clay, clay loam, or clay
Content of rock fragments=0 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 1 to 4
Texture=clay loam or silty clay loam
Content of rock fragments=2 to 10 percent

Flatrock Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Parent material: Alluvium; and in the bedrock substratum phase, alluvium overlying limestone or dolostone
Landform: Rises, natural levees, and flats on flood plains
Slope: 0 to 2 percent

Adjacent soils: Knoxdale, Shoals, Sloan

Taxonomic class: Fine-loamy, mixed, mesic Fluvaquentic Eutrochrepts

Typical Pedon
Flatrock silt loam, 0 to 2 percent slopes, occasionally flooded, about 5.5 miles south of Mt. Blanchard, in Delaware Township, about 2220 feet west and 80 feet north of the southeast corner of sec. 36, T. 2 S., R. 11 E.

Ap=0 to 11 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common fine roots; neutral; clear smooth boundary.

Bw1=11 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint brown (10YR 5/3) coatings on faces of peds; few medium distinct yellowish brown (10YR 5/6) and common fine and medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

Bw2=15 to 27 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint brown (10YR 5/3) and common distinct grayish brown (10YR 5/2) coatings on faces of peds;; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium faint brown (10YR 5/3) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1)

masses of iron and manganese oxide accumulation on faces of peds neutral; gradual wavy boundary.

Bw3=27 to 43 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 5/3) and grayish brown (10YR 5/2) coatings on faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; many distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

BC=43 to 52 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) coatings on faces of peds; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/6) and common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; neutral; clear wavy boundary.

C=52 to 71 inches; brown (10YR 4/3) loam; massive; friable; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Cg=71 to 80 inches; dark grayish brown (10YR 4/2) coarse sandy loam; massive; friable; common medium and coarse faint gray (10YR 5/1) iron depletions in the matrix; few medium and coarse distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 3 percent rock fragments; neutral.

Range in Characteristics
Thickness of the solum: 25 to 55 inches
Depth to carbonates: 40 to over 80 inches
Depth to bedrock: Greater than 80 inches; in the bedrock substratum phase, 60 to 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 or 3
Texture=silt loam or loam
Content of rock fragments=0 to 5 percent

Bw or Bg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=loam, silty clay loam, silt loam, or clay loam, and includes subhorizons of sandy loam in the lower part
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=loam, silt loam, silty clay loam, clay loam, coarse sandy loam, sandy loam, or fine sandy loam, and is commonly stratified; gravelly analogues of these textures are in the FbA map unit
Content of rock fragments=0 to 15 percent; 15 to 25 percent in the FbA map unit

Fox Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the solum and rapid or very rapid in the substratum
Parent material: Loamy deposits or beach deposits overlying stratified sandy and gravelly material
Landform: Rises, flats, and knolls on beach ridges on lake plains and on outwash plains and moraines
Position on the landform: Shoulders, summits, backslopes
Slope: 0 to 12 percent

Adjacent soils:
On beach ridges=Aurand, Oshtemo, Vaughnsville
On outwash plains=Thackery, Westland
On moraines=Thackery, Shawtown

Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs

Typical Pedon
Fox loam, 2 to 6 percent slopes, about 2.5 miles east-northeast of Van Buren, in Cass Township, 1440 feet south and 1560 feet east of the northwest corner of sec. 9, T. 2 N., R. 11 E.

Ap=0 to 9 inches; dark brown (10YR 3/3) loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; 5 percent intermixing of dark yellowish brown (10YR 4/4) Bt1 material; 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt1=9 to 14 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure parting to moderate fine and medium granular; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common faint brown (10YR 4/3) worm channels and casts; 7 percent rock fragments; moderately acid; clear wavy boundary.

Bt2=14 to 20 inches; brown (7.5YR 4/4) gravelly clay loam; moderate fine and medium subangular blocky structure parting to moderate fine and medium granular; friable; few fine roots; common distinct dark reddish brown

(5YR 3/3) clay films on faces of peds; common distinct brown (10YR 4/3) worm channels and casts; 20 percent rock fragments; moderately acid; clear smooth boundary.

Bt3=20 to 26 inches; dark yellowish brown (10YR 4/4) sandy clay loam with thin strata of sandy loam; weak fine and medium subangular blocky structure parting to moderate fine and medium granular; very friable; few fine roots; common distinct dark reddish brown (5YR 3/3) clay films on faces peds and as bridging between sand grains; 5 percent rock fragments; moderately acid; clear wavy boundary.

Bt4=26 to 37 inches; dark yellowish brown (10YR 3/4) clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 3/4) clay films on ped faces and as bridging between sand grains; common faint brown (10YR 4/3) worm channels and casts; 10 percent rock fragments; neutral; clear wavy boundary.

2C1=37 to 47 inches; brown (10YR 5/3) loamy coarse sand; single grain; loose; 5 percent rock fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

2C2=47 to 68 inches; brown (10YR 5/3) gravelly loamy coarse sand; single grain; loose; 15 percent rock fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

2C3=68 to 80 inches; brown (10YR 5/3) coarse sand; single grain; loose; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Depth to carbonates: 24 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=2 to 15 percent

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 3 to 5, chroma of 3 or 4
Texture=loam, clay loam, or sandy clay loam, or the gravelly analogues of those textures
Content of rock fragments=0 to 35 percent

2C horizon:
Color=hue of 10YR, value of 5 to 7, chroma of 3 or 4
Texture=loamy coarse sand or coarse sand, or the gravelly or very gravelly analogues of those textures, and is commonly stratified
Content of rock fragments=0 to 50 percent

Fulton Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow in the solum and slow or very slow in the substratum
Parent material: Glaciolacustrine deposits; and in the till substratum phase, glaciolacustrine deposits overlying till
Landform: Rises on lake plains and disintegration moraines
Position on the landform: Shoulders, summits
Slope: 0 to 2 percent

Adjacent soils: Del Rey, Lucas, Toledo

Taxonomic class: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon
Fulton silt loam, 0 to 2 percent slopes, about 5 miles southwest of McComb, in Blanchard Township, 780 feet east and 1040 feet north of the southwest corner of sec. 18, T. 1 N., R. 9 E.

Ap=0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; moderately acid; clear smooth boundary.

Bt=8 to 16 inches; yellowish brown (10YR 5/4) silty clay; moderate fine and medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on vertical faces of peds; many medium distinct gray (10YR 5/1) iron depletions in the matrix; many fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; moderately acid; clear wavy boundary.

Btg1=16 to 22 inches; grayish brown (2.5Y 5/2) silty clay; moderate fine and medium subangular blocky structure; firm; few fine roots; many distinct gray (10YR 5/1) clay films on faces of peds; common prominent black (10YR 2/1) masses of manganese oxide accumulation on faces of peds; common medium faint gray (10YR 5/1) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) and few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly acid; gradual wavy boundary.

Btg2=22 to 29 inches; grayish brown (2.5Y 5/2) silty clay; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; few prominent black (10YR 2/1) masses of manganese oxide accumulation on faces of peds;

common medium and coarse faint gray (10YR 5/1) iron depletions in the matrix; many medium and coarse distinct dark yellowish brown (10YR 4/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

B't1=29 to 36 inches; dark yellowish brown (10YR 4/4) silty clay; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; few fine roots; many distinct gray (10YR 5/1) clay films on faces of peds; few distinct black (10YR 2/1) masses of manganese oxide accumulation on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

B't2=36 to 42 inches; dark yellowish brown (10YR 4/4) silty clay; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium and fine distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium and fine distinct gray (10YR 5/1) iron depletions in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; common medium distinct light gray (10YR 7/2) moderately cemented calcium carbonate nodules in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=42 to 60 inches; dark yellowish brown (10YR 4/4) silty clay with thin strata of silt loam and silty clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; many distinct gray (10YR 5/1) coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on vertical faces of peds; common medium distinct light gray (10YR 7/2) moderately cemented calcium carbonate nodules in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

C=60 to 80 inches; brown (10YR 4/3) silty clay; massive, with widely spaced vertical fractures; varved; very firm; few distinct gray (10YR 5/1) coatings on faces of fractures; common fine and medium distinct gray (10YR 5/1) iron depletions and yellowish brown (10YR 5/6) masses of iron accumulation along fractures; few prominent white (10YR 8/1) masses of calcium carbonate accumulation on faces of fractures; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 22 to 40 inches
Depth to till: Greater than 80 inches; in the till substratum phase, 60 to 80 inches
Depth to dense material: 60 to 80 inches in the till substratum phase
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 or 2
Texture=silt loam

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=silty clay or clay; some pedons have thin strata of silty clay loam

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture=silty clay, clay, or silty clay loam

2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 3 to 6
Texture=clay, clay loam, or silty clay loam
Content of rock fragments=1 to 15 percent

Gallman Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid in the solum, and moderately rapid or rapid in the substratum
Parent material: Poorly sorted outwash
Landform: Knolls on outwash areas on end moraines and ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 2 to 6 percent

Adjacent soils: Houcktown, Oshtemo, Rensselaer, Westland

Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon
Gallman loam, 2 to 6 percent slopes, about 2.5 miles west of Mt. Cory, in Union Township, about 2240 feet east and 760 feet south of the northwest corner of sec. 30, T. 1 S., R. 9 E.

Ap=0 to 10 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common fine and few medium roots; 5 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=10 to 18 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; common fine roots; common faint brown (10YR 4/3) clay films on faces of peds; 5 percent rock fragments; neutral; clear wavy boundary.

Bt2=18 to 30 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; few fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 10 percent rock fragments; neutral; clear wavy boundary.

Bt3=30 to 42 inches; brown (10YR 4/3) gravelly loam; weak medium and coarse subangular blocky structure; friable; few fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds and common faint brown (10YR 4/3) clay bridging between sand grains; 20 percent rock fragments; neutral; gradual wavy boundary.

Bt4=42 to 61 inches; brown (10YR 4/3) gravelly sandy loam with thin strata of sandy loam; weak medium and coarse subangular blocky structure; very friable; few fine roots in the upper part; common faint dark yellowish brown (10YR 4/4) clay bridging between sand grains; 20 percent rock fragments; neutral; gradual wavy boundary.

C=61 to 80 inches; brown (10YR 5/3) gravelly sandy loam; massive; very friable; 30 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics
Thickness of the solum: 55 to 120 inches
Depth to carbonates: 55 to 120 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 15 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 or 4
Texture=loam, clay loam, sandy clay loam, or sandy loam, or the gravelly analogues of those textures
Content of rock fragments=2 to 30 percent

C horizon:
Color=hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=sandy loam, loamy sand, or sand, or the gravelly or very gravelly analogues of those textures
Content of rock fragments=2 to 40 percent

Gilford Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately rapid in the upper part of the solum and rapid in the lower part of the solum and in the substratum

Parent material: Loamy and sandy deposits
Landform: Flats and depressions on outwash plains
Slope: 0 to 1 percent

Adjacent soils: Adrian, Ottokee

Taxonomic class: Coarse-loamy, mixed, mesic Typic Endoaquolls

Typical Pedon
Gilford mucky loam, 0 to 1 percent slopes, about 4.3 miles northeast of Vanlue, in Biglick Township, 780 feet south and 320 feet west of the northeast corner of sec. 25, T. 1 N., R. 12 E.

Ap=0 to 12 inches; black (10YR 2/1) mucky loam, very dark grayish brown (10YR 3/2) dry; weak fine and medium granular structure; very friable; common fine roots; common fine prominent brown (7.5YR 4/4) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary.

Bg1=12 to 21 inches; dark gray (10YR 4/1) fine sandy loam; weak fine and medium subangular blocky structure; very friable; common fine roots; common faint very dark gray (10YR 3/1) organic coatings in old root channels and pores; common fine and medium prominent strong brown (7.5YR 5/6) and common medium and coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation oriented along old root channels and in pores; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; slightly acid; clear wavy boundary.

Bg2=21 to 27 inches; gray (10YR 5/1) loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings in old root channels and pores; common faint dark gray (10YR 4/1) coatings on vertical faces of peds; common medium prominent strong brown (7.5YR 5/6) and common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation oriented along old root channels and in pores; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

BC=27 to 36 inches; brown (10YR 5/3) loamy fine sand; weak medium and coarse subangular blocky structure; very friable; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings in old root channels and pores; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common medium prominent (7.5YR 5/6) masses of iron accumulation oriented along old root channels and in pores; many medium and coarse faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Cg1=36 to 64 inches; grayish brown (10YR 5/2) fine sand with thin strata of silty clay loam; single grain; loose;

few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation oriented along old root channels and in pores in the upper part; many medium and coarse faint brown (10YR 5/3) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.

Cg2=64 to 80 inches; dark grayish brown (10YR 4/2) sand with strata of coarse sand; single grain; loose; common medium and coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 2 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 16 inches
Thickness of the solum: 30 to 40 inches
Depth to carbonates: 30 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=mucky loam
Content of rock fragments=0 to 3 percent

Bg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture=fine sandy loam, sandy loam, or loam
Content of rock fragments=0 to 3 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 3
Texture=loamy sand, sand, coarse sand, or fine sand
Content of rock fragments=0 to 3 percent

Glynwood Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow in the solum and slow or very slow in the substratum
Parent material: Till; and till overlying limestone or dolostone in the bedrock substratum phase
Landform: Dissected areas and knolls on end moraines, ground moraines, and disintegration moraines; GmA map unit is on rises on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 12 percent

Adjacent soils:
On end moraines and ground moraines=Blount, Houcktown, Pewamo
On disintegration moraines=Blount, Houcktown, Jenera, Pewamo, Shinrock

Taxonomic class: Fine, illitic, mesic Aquic Hapludalfs

Typical Pedon
Glynwood silt loam, 2 to 6 percent slopes, about 1.5 miles southeast of Vanlue, in Amanda Township, about 1760 feet west and 1460 feet north of the southeast corner of sec. 15, T. 1 S., R. 12 E.

Ap=0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; few medium and common fine roots; 5 percent intermixed yellowish brown (10YR 5/6) Bt1 material; less than 1 percent rock fragments; neutral; clear smooth boundary.

Bt1=9 to 13 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium and fine subangular blocky structure; friable; common fine roots; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; common distinct brown (10YR 4/3) coatings in worm channels; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; common distinct brown (10YR 5/3) clay depletions on vertical faces of peds; few medium faint strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine prominent very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Bt2=13 to 21 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (10YR 5/3) and few faint brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 4/3) coatings in worm channels; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few faint brown (10YR 5/3) clay depletions on vertical faces of peds; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; slightly acid; gradual wavy boundary.

Bt3=21 to 30 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) and common faint brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 4/3) coatings in worm channels; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; neutral; gradual wavy boundary.

Bt4=30 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct grayish brown (10YR 5/2) and common faint brown (10YR 5/3) clay films on faces of peds; few distinct brown (10YR 4/3) coatings in worm channels; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; 3 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=37 to 47 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots in the upper part; common distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; 4 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

Cd=47 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; very firm; common medium distinct grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation oriented along faces of fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 25 to 50 inches
Depth to carbonates: 16 to 40 inches
Depth to dense material: 25 to 50 inches
Depth to bedrock: Greater than 80 inches; in the bedrock substratum phase, 60 to 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silt loam, loam, clay loam, or silty clay loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture=silty clay, clay, clay loam, or silty clay loam
Content of rock fragments=0 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=clay loam, silty clay loam, or loam
Content of rock fragments=1 to 15 percent

Harrod Series

Depth class: Moderately deep
Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Alluvium overlying limestone or dolostone
Landform: Natural levees and flats on flood plains
Slope: 0 to 1 percent

Adjacent soils: Flatrock, Medway, Shoals, Sloan

Taxonomic class: Fine-loamy, mixed, mesic Fluvaquentic Hapludolls

Typical Pedon
Harrod silt loam, 0 to 1 percent slopes, frequently flooded, about .5 mile east of Westminster, in Allen County, Ohio, Auglaize Township, about 1440 feet north and 1550 feet east of the southwest corner of sec. 17, T. 4 S., R. 8 E.

A=0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and very fine subangular blocky structure; friable; many fine and very fine roots and common medium roots; few, very fine, prominent white (10YR 8/1) soft masses of calcium carbonate in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

Bw1=11 to 14 inches; dark grayish brown (10YR 4/2) loam; moderate fine and medium subangular blocky structure; friable; common medium, fine, and very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; very few fine prominent reddish brown (5YR 4/4) masses of iron and manganese accumulation in the matrix; slightly effervescent; moderately alkaline; clear smooth boundary.

Bw2=14 to 19 inches; dark grayish brown (10YR 4/2) loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common fine and very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; very few faint black (10YR 2/1) masses of manganese accumulation on faces of peds; common fine prominent yellowish brown (10YR 5/6) and distinct brown (7.5YR 4/4) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; clear wavy boundary.

Bw3=19 to 27 inches; dark grayish brown (10YR 4/2) loam; moderate medium subangular blocky structure; friable; common fine and very fine roots; few faint gray (10YR 5/1) iron depletions on faces of peds; very few faint black (10YR 2/1) masses of manganese accumulation on faces of peds; common fine prominent yellowish

brown (10YR 5/6) and few fine prominent reddish brown (5YR 4/4) masses of iron accumulation in the matrix; 4 percent limestone fragments; slightly effervescent; moderately alkaline; clear wavy boundary.

Bg=27 to 31 inches; gray (10YR 5/1) loam with strata of sandy loam; weak medium and coarse subangular blocky structure; friable; very few prominent brown (7.5YR 4/4) masses of iron accumulation on faces of peds; very few fine prominent brown (7.5YR 4/4) masses of iron accumulation in the matrix; 2 percent angular limestone channers; 9 percent subangular limestone fragments; slightly effervescent; moderately alkaline; abrupt smooth boundary.

2R=31 inches; white (10YR 8/1) limestone.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 0 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=silt loam
Content of rock fragments=0 to 7 percent

Bw horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silt loam, loam, clay loam, or sandy loam
Content of rock fragments=0 to 15 percent

Bg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 or 2
Texture=loam or sandy loam
Content of rock fragments=5 to 15 percent

Haskins Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part of the solum, and slow or very slow in the lower part of the solum and in the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Rises on lake plains
Position on the landform: Shoulders, summits
Slope: 0 to 2 percent
Adjacent soils: Hoytville, Mermill, Nappanee, Houcktown

Taxonomic class: Fine-loamy, mixed, mesic Aeric Epiaqualfs

Typical Pedon
Haskins loam, 0 to 2 percent slopes, about 1 mile west-northwest of McComb, in Pleasant Township, about 1040 feet north and 1840 feet west of the southeast corner of sec. 22, T. 2 N., R. 9 E.

Ap=0 to 9 inches; dark brown (10YR 3/3) loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; common fine roots; 5 percent intermixing of grayish brown (10YR 5/2) BEg material; 2 percent rock fragments; moderately acid; abrupt smooth boundary.

BEg=9 to 13 inches; grayish brown (10YR 5/2) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few faint light brownish gray (10YR 6/2) clay films on faces of peds; few faint dark grayish brown (10YR 4/2) worm casts and as organic coatings in pores; few medium prominent strong brown (7.5YR 5/6) and many medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common distinct brown (7.5YR 4/4) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; moderately acid; clear wavy boundary.

Btg=13 to 18 inches; grayish brown (10YR 5/2) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many faint grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; few faint dark grayish brown (10YR 4/2) worm casts and as organic coatings in pores; many medium prominent yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct dark brown (7.5YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; slightly acid; clear wavy boundary.

Bt1=18 to 24 inches; brown (10YR 5/3) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and lining old root channels; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/4) and common coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct dark brown (7.5YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2=24 to 30 inches; yellowish brown (10YR 5/6) clay loam; moderate fine and medium structure; friable; few fine roots; common prominent dark grayish brown (10YR 4/2) clay films on faces of peds and lining old root channels; common medium prominent dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/4) and few medium faint strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few prominent dark brown (7.5YR 3/2) masses of iron and

manganese oxide accumulation on faces of peds; 3 percent rock fragments; neutral; clear smooth boundary.

B'tg=30 to 36 inches; dark grayish brown (10YR 4/2) loam with strata of yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds and bridging between sand grains in the loam material; common medium prominent yellowish brown (10YR 5/6) and distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few faint dark brown (7.5YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 6 percent rock fragments in the loam material and 1 percent rock fragments in the fine sandy loam strata; neutral; abrupt smooth boundary.

2BC=36 to 52 inches; yellowish brown (10YR 5/4) clay; weak medium and coarse subangular blocky structure; very firm; common distinct gray (10YR 6/1) coatings on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; gradual irregular boundary.

2Cd=52 to 80 inches; dark yellowish brown (10YR 4/4) clay; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 6/1) coatings on faces of fractures; few fine distinct grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 30 to 55 inches
Depth to carbonates: 25 to 40 inches
Depth to till: 20 to 40 inches
Depth to dense material: 40 to 60 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 1 to 3
Texture=loam or fine sandy loam
Content of rock fragments=0 to 10 percent
Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 6
Texture=clay loam, sandy clay loam, or loam, or the gravelly analogues of the textures
Content of rock fragments=0 to 20 percent

2BC or 2BCg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=1 to 10 percent

2Cd or 2Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=1 to 10 percent

Houcktown Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum, moderately slow or slow in the lower part of the solum, and slow or very slow in the substratum
Parent material: Loamy water-sorted deposits and the underlying till
Landform: Rises and knolls on end moraines, ground moraines, lake plains, and disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils:
On end moraine and ground moraines=Blount, Glynwood, Pewamo
On disintegration moraines=Glynwood, Jenera
On lake plains=Haskins, Jenera, Mermill, Shawtown

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Houcktown loam, 2 to 6 percent slopes, about 2 miles southwest of Benton Ridge, in Union Township, about 2200 feet north and 480 feet west of the southeast corner of section 4, T. 1 S., R. 9 E.

Ap=0 to 10 inches; dark brown (10YR 3/3) loam, light gray (10YR 7/2) dry; weak fine and medium granular structure; friable; common fine and few medium roots; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 6 percent rock fragments; moderately acid; abrupt smooth boundary.

Bt1=10 to 16 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable; common fine roots; few faint brown (10YR 4/3) clay films on faces of peds; common distinct brown (10YR 5/3) coatings on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on faces of peds and in pores; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse faint brown (10YR 5/3) and few fine and medium distinct yellowish brown

(10YR 5/6) masses of iron accumulation in the matrix; few fine distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 8 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2=16 to 20 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; many medium and coarse faint dark yellowish brown (10YR 4/4) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 6 percent rock fragments; slightly acid; clear wavy boundary.

Bt3=20 to 27 inches; brown (10YR 5/3) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; many medium and coarse faint dark yellowish brown (10YR 4/4) and common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 9 percent rock fragments; neutral; clear smooth boundary.

Bt4=27 to 30 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct dark gray (10YR 4/1) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) and faint dark brown (7.5YR 3/4) masses of iron accumulation in the matrix; common medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 11 percent rock fragments; neutral; abrupt smooth boundary.

2Bt5=30 to 34 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; gradual wavy boundary.

2BC=34 to 50 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on vertical faces of peds; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

2Cd1=50 to 70 inches; yellowish brown (10YR 5/4) silt loam; massive, with widely spaced vertical fractures; very firm; common distinct grayish brown (10YR 5/2) coatings on faces of fractures; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on faces of fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd2=70 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; very firm; few distinct grayish brown (10YR 5/2) coatings on faces of fractures; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common distinct light brownish gray (10YR 6/2) masses of calcium carbonate accumulation on faces of fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 25 to 45 inches
Depth to till: 20 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: More than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 10 percent

Bt or Btg horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 2 to 4
Texture=loam, clay loam, or sandy clay loam, or the gravelly analogues of those textures; strata of fine sandy loam, sandy loam, silt loam, or silty clay loam are in some pedons
Content of rock fragments=0 to 25 percent

2Bt and 2BC horizons:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=clay loam or silty clay loam
Content of rock fragments=1 to 7 percent

2Cd horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silt loam, loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Hoytville Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum
Parent material: Till
Landform: Flats, depressions, and drainageways on lake plains
Slope: 0 to 1 percent

Adjacent soils: Aurand, Mermill, Mortimer, Nappanee, St. Clair

Taxonomic class: Fine, illitic, mesic Mollic Epiaqualfs

Typical Pedon
Hoytville silty clay, 0 to 1 percent slopes, about 1 mile northwest of McComb, in Pleasant Township, about 2300 feet east and 1220 feet south of the northwest corner of sec. 22, T. 2 N., R. 9 E.

Ap=0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay, grayish brown (10YR 5/2) dry; weak medium and coarse subangular blocky structure parting to moderate fine and medium granular; firm; common fine roots; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 10 percent intermixing of gray (10YR 5/1) Btg1 material; 1 percent rock fragments; neutral; abrupt smooth boundary.

Btg1=8 to 16 inches; gray (10YR 5/1) clay; moderate fine and medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common medium distinct yellowish brown (10YR 5/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds;2 percent rock fragments; neutral; gradual wavy boundary.

Btg2=16 to 25 inches; gray (10YR 5/1) clay; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings lining old root channels; common medium distinct yellowish brown (10YR 5/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; slightly alkaline; gradual wavy boundary.

Btg3=25 to 34 inches; grayish brown (10YR 5/2) clay; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; firm; few fine roots; few faint gray (10YR 5/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings lining old root channels; many medium distinct yellowish brown (10YR 5/4) and few medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; slightly alkaline; gradual wavy boundary.

Btg4=34 to 41 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; few faint gray (10YR 5/1) clay films on vertical faces of prisms; few distinct very dark grayish brown (10YR 3/2) organic coatings lining old root channels; common fine and medium faint gray (10YR 5/1) iron depletions in the matrix; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint light gray (10YR 7/2) calcium carbonate concretions in the matrix; 3 percent rock fragments; slightly effervescent discontinuously in the matrix; moderately alkaline; clear wavy boundary.

Bt=41 to 52 inches; yellowish brown (10YR 5/4) clay; weak medium and coarse prismatic structure parting to weak medium subangular blocky; firm; few distinct gray (10YR 5/1) clay films on vertical faces of peds; few distinct light gray (10YR 7/2) calcium carbonate coatings on faces of peds; common medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

BC=52 to 64 inches; yellowish brown (10YR 5/4) clay; weak coarse subangular blocky structure; very firm; few distinct gray (10YR 5/1) coatings on vertical faces of peds; few distinct light gray (10YR 7/2) calcium carbonate coatings on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd1=64 to 72 inches; yellowish brown (10YR 5/4) clay; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 5/1) coatings on faces of fractures; few distinct light gray (10YR 7/2) calcium carbonate coatings on faces of fractures; common medium distinct grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along

fractures; few medium distinct light gray (10YR 7/2) masses of calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2=72 to 80 inches; yellowish brown (10YR 5/4) clay; massive, with widely spaced vertical fractures; very firm; few medium distinct gray (10YR 5/1) iron depletions and yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the dark colored surface layer: 7 to 9 inches
Thickness of the solum: 40 to 65 inches
Depth to carbonates: 30 to 55 inches
Depth to dense material: 40 to 65 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2, 2.5, or 3 , chroma of 1 or 2
Texture=silty clay or silty clay loam
Content of rock fragments=0 to 5 percent

Btg or Bt horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, chroma of 1 or 2; includes chroma of 3 or 4 in the lower part
Texture=clay or silty clay
Content of rock fragments=1 to 10 percent

BC or BCg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 or 5, chroma of 1 to 4
Texture=clay loam, silty clay loam, silty clay, or clay
Content of rock fragments=2 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma
of 1 to 6
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=2 to 10 percent

Jenera Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum and slow or moderately slow in the lower part of the solum and in the substratum; slow or very slow in the lower part of the solum and in the substratum in BrA, HrB, and JfB map units
Parent material: Stratified loamy and silty glaciolacustrine deposits and the underlying till
Landform: Rises and knolls on lake plains, disintegration moraines, and ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils:
On ground moraines=Blount, Houcktown
On disintegration moraines=Blount, Glynwood, Pewamo, Shinrock
On lake plains=Rensselaer, Tiderishi, Vanlue

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Jenera fine sandy loam, 0 to 2 percent slopes, about 3.5 miles northwest of Benton Ridge, in Blanchard Township, about 375 feet west and 125 feet south of the northeast corner of sec. 19, T. 1 N., R. 9 E.

Ap=0 to 10 inches; brown (10YR 4/3) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; very friable; common fine roots; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; slightly acid; clear smooth boundary.

Bt1=10 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; common distinct brown (10YR 4/3) organic coatings on vertical faces of peds; common distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium and coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt2=16 to 24 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint brown (10YR 4/3) clay films and few distinct grayish brown (10YR 4/2) clay films on faces of peds; common medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; neutral; clear wavy boundary.

Bt3=24 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common fine and medium distinct black (10YR 2/1) masses of manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

Bt4=31 to 37 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common fine and medium distinct black (10YR 2/1) masses of manganese oxide accumulation on faces of peds; neutral; abrupt irregular boundary.

2BC1=37 to 50 inches; brown (10YR 4/3) silty clay loam with thin strata of silt loam; weak coarse subangular blocky structure; firm; common distinct gray (10YR 5/1) coatings on faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on faces of peds; strongly effervescent; slightly alkaline; clear wavy boundary.

3BC2=50 to 56 inches; brown (10YR 4/3) clay loam; weak medium and coarse subangular blocky structure; firm; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; 5 percent rock fragments; strongly effervescent; slightly alkaline; gradual irregular boundary.

3C=56 to 80 inches; brown (10YR 4/3) clay loam; massive with weak medium platy structure; firm; common fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loamy mantle: 20 to 45 inches
Thickness of the solum: 40 to 65 inches
Depth to carbonates: 25 to 55 inches
Depth to till: 40 to 60 inches
Depth to dense material: 40 to 60 inches in BrA, HrB, and JfB map units
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=fine sandy loam
Content of rock fragments=0 to 5 percent

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 to 6
Texture=loam, sandy clay loam, or clay loam; thin strata of fine sandy loam, sandy loam, silt loam, or silty clay loam are in some pedons
Content of rock fragments=0 to 5 percent

2Bt or 2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silty clay loam or silt loam
Content of rock fragments=typically absent

3BC or 3C or 3Cd horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silty clay loam, or loam
Content of rock fragments=1 to 7 percent

Joliet Series

Depth class: Shallow
Drainage class: Poorly drained
Permeability: Moderate
Parent material: Loamy drift overlying limestone or dolostone
Landform: Depressions, drainageways, and flats on ground moraines and stream terraces
Slope: 0 to 1 percent

Adjacent soils: Millsdale, Randolph

Taxonomic class: Loamy, mixed, mesic Lithic Endoaquolls

Typical Pedon
Joliet loam, 0 to 1 percent slopes, about 4 miles east of Benton Ridge, in Liberty Township, about 1300 feet west and 1280 north of the southeast corner of sec. 33, T. 1 N., R. 10 E.

Ap=0 to 9 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; weak medium subangular blocky structure; friable; many fine roots; few rock fragments; neutral; gradual wavy boundary.

Btg=9 to 17 inches; very dark gray (10YR 3/1) clay loam, gray (10YR 5/1) dry; moderate medium subangular blocky structure; firm; common fine roots; common medium faint dark grayish brown (10YR 4/2) masses of iron accumulation in the matrix; few rock fragments; neutral; abrupt wavy boundary.

Cg=17 to 18 inches; dark grayish brown (10YR 4/2) fine sandy loam; massive; friable; few fine roots; few rock fragments; slightly alkaline; abrupt smooth boundary.

2R=18 to 20 inches; light gray (10YR 7/2) limestone.

Range in Characteristics
Thickness of the mollic epipedon: 7 to 17 inches
Thickness of the solum: 10 to 20 inches
Depth to bedrock: 10 to 20 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=loam
Content of rock fragments=0 to 15 percent

Btg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 3 to 5, chroma of 0 to 2
Texture=clay loam, loam, or silty clay loam
Content of rock fragments=0 to 15 percent

Cg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 or 2
Texture=fine sandy loam, sandy loam, or loamy sand
Content of rock fragments=0 to 15 percent

The Joliet soils in Hancock County have an argillic horizon (Bt). In addition, there is more sand and less clay in the Cg horizon. They classify as loamy, mixed, mesic Lithic Argiaquolls and are taxadjuncts to the Joliet series. This difference, however, does not significantly affect the use and management of this soil.

Knoxdale Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Parent material: Alluvium
Landform: Natural levees, flats, and rises on flood plains
Slope: 0 to 2 percent

Adjacent soils: Flatrock, Shoals, Sloan

Taxonomic class: Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts

Typical Pedon
Knoxdale silt loam, 0 to 2 percent slopes, occasionally flooded, about 4.5 miles south of Mt. Blanchard, in Delaware Township, about 380 feet east and 260 feet north of the southwest corner of sec. 25, T. 2 S., R. 11 E.

Ap=0 to 11 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to weak fine and medium granular; friable; common fine roots; neutral; clear smooth boundary.

Bw1=11 to 16 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bw2=16 to 22 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bw3=22 to 30 inches; dark yellowish brown (10YR 4/4) loam; weak medium and coarse subangular blocky structure; friable; few fine roots; common faint brown (10YR 4/3) coatings on faces of peds; few fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear wavy boundary.

Bw4=30 to 41 inches; brown (10YR 4/3) loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint brown (10YR 4/3) coatings on faces of peds; few medium faint brown (10YR 5/3) and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bw5=41 to 47 inches; brown (10YR 4/3) loam with strata of sandy loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint dark grayish brown (10YR 4/2) coatings on faces of peds; common fine and medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) and common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

C=47 to 72 inches; brown (10YR 5/3) loam with thin strata of silt loam and sandy loam; massive; friable; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Cg=72 to 80 inches; dark gray (10YR 4/1) sandy loam with thin strata of loam and silt loam; massive; very friable; common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 3 percent rock fragments; neutral.

Range in Characteristics
Thickness of the solum: 25 to 55 inches
Depth to carbonates: 50 to more than 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 2 to 4
Texture=silt loam
Content of rock fragments=0 to 5 percent

Bw horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=silt loam or loam, with subhorizons of clay loam and silty clay loam
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4, and includes 1 or 2 in the lower part
Texture=loam, sandy loam, silt loam, or fine sandy loam, and is commonly stratified
Content of rock fragments=0 to 15 percent

Lamberjack Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the loamy solum, rapid in the gravelly and sandy substratum, and slow or very slow in the till substratum
Parent material: Loamy, sandy, and gravelly outwash overlying till
Landform: Rises on outwash plains and in outwash areas on end moraines and ground moraines
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent

Adjacent soils: Alvada, Fox, Oshtemo, Shawtown, Thackery

Taxonomic class: Fine-loamy, mixed, mesic Aeric Epiaqualfs

Typical Pedon
Lamberjack loam, 0 to 2 percent slopes, about 4 miles east of Findlay, in Marion Township, about 2040 feet west and 360 feet north of the southeast corner of sec. 14, T. 1 N., R. 11 E.

Ap=0 to 11 inches; dark grayish brown (10YR 4/2) loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; 5 percent rock fragments; moderately acid; clear smooth boundary.

Bt1=11 to 17 inches; brown (10YR 5/3) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint dark yellowish brown (10YR 4/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 10 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2=17 to 24 inches; brown (10YR 5/3) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; many fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium faint dark yellowish brown (10YR 4/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 10 percent rock fragments; neutral; gradual wavy boundary.

Bt3=24 to 32 inches; brown (10YR 5/3) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 10 percent rock fragments; neutral; gradual wavy boundary.

Btg1=32 to 39 inches; grayish brown (10YR 5/2) loam; weak medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; many faint brown (10YR 5/3) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 10 percent rock fragments; neutral; clear smooth boundary.

2Btg2=39 to 44 inches; dark gray (10YR 4/1) gravelly loam; weak medium subangular blocky structure; friable; common faint dark gray (10YR 4/1) clay bridging between sand grains; few medium distinct brown

(10YR 5/3) masses of iron accumulation in the matrix; 15 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; clear smooth boundary.

2Cg1=44 to 50 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam; single grain; loose; 25 percent rock fragments; strongly effervescent; slightly alkaline; gradual smooth boundary.

2Cg2=50 to 56 inches; grayish brown (10YR 5/2) gravelly loamy coarse sand; single grain; loose; 25 percent rock fragments; strongly effervescent; moderately alkaline; gradual smooth boundary.

2Cg3=56 to 62 inches; grayish brown (10YR 5/2) very gravelly loamy coarse sand; single grain; loose; 50 percent rock fragments; strongly effervescent; moderately alkaline; abrupt smooth boundary.

3Cdg=62 to 80 inches; dark gray (10YR 4/1) loam; massive; very firm; few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to till: 60 to 80 inches
Depth to dense material: 60 to 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=2 to 14 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=loam, clay loam, or sandy clay loam
Content of rock fragments=2 to 14 percent

2Bt or 2Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=gravelly analogues of loam, clay loam, sandy clay loam, or sandy loam
Content of rock fragments=15 to 35 percent

2C or 2Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=gravelly or very gravelly analogues of loamy sand, loamy coarse sand, sandy loam, or coarse sandy loam
Content of rock fragments=15 to 60 percent

3Cd or 3Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=clay loam, loam, silt loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Lucas Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow or very slow
Parent material: Glaciolacustrine deposits
Landform: Knolls on dissected areas on lake plains; a few areas are on disintegration moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 2 to 6 percent

Adjacent soils: Fulton, Toledo

Taxonomic class: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon
Lucas silty clay loam, 2 to 6 percent slopes, eroded, about 4.5 miles southwest of McComb, in Blanchard Township, about 1070 feet east and 330 feet south of the northwest corner of sec. 7, T. 1 N., R. 9 E.

Ap=0 to 7 inches; brown (10YR 5/3) silty clay loam, very pale brown (10YR 7/3) dry; moderate fine and medium granular structure; friable; few coarse, and common fine and medium roots; 25 percent intermixing of yellowish brown (10YR 5/4) Bt1 material; strongly acid; clear smooth boundary.

Bt1=7 to 13 inches; yellowish brown (10YR 5/4) silty clay; moderate fine and medium subangular blocky structure; firm; few coarse, and common fine and medium roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds;; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds slightly acid; gradual wavy boundary.

Bt2=13 to 18 inches; yellowish brown (10YR 5/4) silty clay; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; common faint brown (10YR 5/3) clay films on faces of peds; few fine faint brown (10YR 5/3) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

Bt3=18 to 23 inches; yellowish brown (10YR 5/4) silty clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few medium and

common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct gray (10YR 5/1) iron depletions in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

Bt4=23 to 31 inches; yellowish brown (10YR 5/4) silty clay; weak very coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct gray (10YR 5/1) iron depletions in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of peds; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=31 to 42 inches; yellowish brown (10YR 5/4) silty clay; weak very coarse prismatic structure parting to weak medium platy; firm; few fine roots; few faint brown (10YR 5/3) coatings on vertical faces of prisms; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) iron and manganese stains on vertical faces of prisms and on faces of plates; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on vertical faces of prisms and on faces of plates; strongly effervescent; moderately alkaline; gradual wavy boundary.

C=42 to 80 inches; yellowish brown (10YR 5/4) silty clay; massive, with widely spaced vertical fractures; platy tendencies; firm; common medium distinct grayish brown (10YR 5/2) iron depletions and yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of fractures and on faces of plates; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 48 inches
Depth to carbonates: 18 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silty clay loam

Bt horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 3 or 4
Texture=silty clay or clay

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=silty clay, clay, or silty clay loam

Lybrand Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow in the solum, and slow or very slow in the substratum
Parent material: Till
Landform: Dissected areas on end moraines and ground moraines
Position on the landform: Backslopes
Slope: 18 to 50 percent

Adjacent soils: Blount, Glynwood, Morley

Taxonomic class: Fine, illitic, mesic Typic Hapludalfs

Typical Pedon
Lybrand silt loam, 18 to 50 percent slopes, about 2 miles northwest of Forest, in Delaware Township, about 2560 feet west and 1260 feet north of the southeast corner of sec. 36, T. 2 S., R. 11 E.

A=0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common fine and medium and few coarse roots; 1 percent rock fragments; strongly acid; abrupt wavy boundary.

BE=4 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; common fine and medium and few coarse roots; common distinct dark brown (10YR 3/3) organic coatings on faces of peds and in pores; few faint pale brown (10YR 6/3) clay depletions on vertical faces of peds; 1 percent rock fragments; strongly acid; gradual wavy boundary.

Bt1=8 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine and medium subangular blocky structure; firm; common fine and medium and few coarse roots; few distinct dark brown (10YR 3/3) organic coatings in old root channels and pores; common faint brown (10YR 5/3) clay films on faces of peds; 2 percent rock fragments; moderately acid; gradual wavy boundary.

Bt2=13 to 18 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium subangular blocky structure; firm; common fine and medium and few coarse roots; common faint brown (10YR 4/3) clay films on faces of peds; 2 percent rock fragments; moderately acid; gradual wavy boundary.

Bt3=18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium subangular blocky structure; firm; common fine and medium roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine

distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Bt4=24 to 29 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine and medium roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; 4 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=29 to 47 inches; yellowish brown (10YR 5/4) clay loam; weak medium platy structure parting to weak medium and coarse subangular blocky; firm; few fine and medium roots in the upper part; common faint dark yellowish brown (10YR 4/4) coatings; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on vertical faces of peds; 4 percent rock fragments; strongly effervescent; slightly alkaline; gradual irregular boundary.

Cd=47 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; very firm; few distinct grayish brown (10YR 5/2) coatings; few fine and medium distinct grayish brown (10YR 5/2) iron depletions oriented along fractures; few faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 20 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 to 4, chroma of 2 or 3
Texture=silt loam
Content of rock fragments=0 to 10 percent

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 4 to 6
Texture=silty clay loam, silty clay, clay, or clay loam
Content of rock fragments=0 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=silty clay loam or clay loam
Content of rock fragments=2 to 15 percent

Medway Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the solum and moderate or moderately rapid in the substratum
Parent material: Alluvium; and in the limestone substratum phase, alluvium overlying limestone or dolostone
Landform: Flats and rises on flood plains
Slope: 0 to 2 percent

Adjacent soils: Knoxdale, Rossburg, Sloan

Taxonomic class: Fine-loamy, mixed, mesic Fluvaquentic Hapludolls

Typical Pedon
Medway silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded, about 1.25 miles north of Rawson, in Union Township, about 1520 feet south and 860 feet west of the northeast corner of sec. 11, T. 1 S., R. 9 E.

Ap=0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; weak medium and coarse angular blocky structure parting to weak fine and medium granular; friable; few fine roots; 2 percent rock fragments; neutral; clear smooth boundary.

Bw1=10 to 14 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint dark grayish brown (10YR 4/2) coatings on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bw2=14 to 20 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint dark grayish brown (10YR 4/2) coatings on faces of peds; common faint dark brown (10YR 3/3) organic coatings on faces of peds; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Bg1=20 to 31 inches; grayish brown (10YR 5/2) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark grayish brown (10YR 4/2) coatings on faces of peds; common medium and coarse faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine and medium distinct dark yellowish brown (10YR 4/4) and

few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few faint very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; few fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bg2=31 to 42 inches; grayish brown (10YR 5/2) silt loam with strata of loam; weak medium subangular blocky structure; friable; few fine roots; common faint dark grayish brown (10YR 4/2) coatings on faces of peds; common fine and medium distinct yellowish brown (10YR 5/4) and common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; gradual wavy boundary.

Bg3=42 to 55 inches; gray (10YR 5/1) loam with strata of sandy loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint gray (10YR 5/1) coatings on faces of peds; common fine and medium distinct dark yellowish brown (10YR 4/4) and common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 7 percent rock fragments; slightly alkaline; gradual wavy boundary.

Cg1=55 to 62 inches; gray (10YR 5/1) very cobbly sandy loam; massive; very friable; common medium and coarse prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 50 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

Cg2=62 to 72 inches; dark gray (5Y 4/1) loam; massive; friable; 5 percent rock fragments; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2R=72 to 74 inches; light gray (10YR 7/2) limestone.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 23 inches
Thickness of the solum: 28 to 60 inches
Depth to carbonates: 35 to more than 80 inches
Depth to bedrock: Greater than 80 inches; in the limestone substratum phase, 60 to 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 to 3
Texture=silt loam
Content of rock fragments=0 to 15 percent
Bw or Bg horizon:
Color=hue of 10YR or 2.5Y, value of 3 to 5, chroma of 2 to 4, with chroma of 1 in the lower part
Texture=silt loam, silty clay loam, loam, or clay loam
Content of rock fragments=0 to 15 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y ranging to 5Y in the limestone substratum phase, value of 4 or 5, chroma of 1 to 6
Texture=loam, sandy loam, loamy coarse sand, or sand, or the gravelly analogues of those textures; in the limestone substratum phase, includes very cobbly analogues of those textures
Content of rock fragments=0 to 35 percent, and 0 to 50 percent in the limestone substratum phase

Mermill Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate in the upper part of the solum and slow or very slow in the lower part of the solum and in the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Flats, depressions, and drainageways on lake plains
Slope: 0 to 1 percent

Adjacent soils: Aurand, Haskins, Hoytville

Taxonomic class: Fine-loamy, mixed, mesic Mollic Epiaqualfs

Typical Pedon
Mermill loam, 0 to 1 percent slopes, about 1.75 miles northeast of McComb, in Portage Township, about 1520 feet north and 2180 feet east of the southwest corner of sec. 18, T. 2 N., R. 10 E.

Ap=0 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium and coarse subangular blocky structure parting to moderate fine and medium granular; friable; common fine roots; 1 percent rock fragments; moderately acid; clear wavy boundary.

Btg1=9 to 14 inches; gray (10YR 5/1) clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common faint gray (10YR 5/1) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common medium prominent yellowish brown (10YR 5/6) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Btg2=14 to 21 inches; grayish brown (2.5Y 5/2) clay loam; weak medium subangular blocky structure; friable; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; gradual wavy boundary.

Btg3=21 to 28 inches; grayish brown (2.5Y 5/2) sandy clay loam with thin strata of fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; common medium faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent yellowish brown (10YR 5/6) and common medium and coarse faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; clear smooth boundary.

2Btg4=28 to 36 inches; grayish brown (10YR 5/2) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint gray (10YR 5/1) clay films on faces of peds; many medium and coarse distinct dark yellowish brown (10YR 4/4) and common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; few medium faint light gray (10YR 7/2) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

2BC=36 to 57 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots in the upper part; common distinct gray (10YR 5/1) coatings on faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

2C=57 to 80 inches; brown (10YR 4/3) clay loam; massive, with widely spaced vertical fractures; firm; few distinct gray (10YR 5/1) coatings on faces of fractures; common fine and medium distinct gray (10YR 5/1) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the darker colored surface layer: 7 to 9 inches
Thickness of the solum: 35 to 60 inches
Depth to carbonates: 24 to 50 inches
Depth to till: 20 to 40 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=loam or clay loam
Content of rock fragments=0 to 10 percent

Btg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma of 1 or 2
Texture=loam, clay loam, or sandy clay loam
Content of rock fragments=0 to 10 percent

2Btg, 2Bt, 2BC, or 2BCg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma of 1 to 4
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=1 to 10 percent

2C or 2Cg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma of 1 to 6
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=1 to 10 percent

Millsdale Series

Depth class: Moderately deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Till overlying limestone or dolostone
Landform: Flats, depressions, and drainageways on ground moraines and lake plains, and on monadnocks on ground moraines
Slope: 0 to 1 percent

Adjacent soils: Milton, Pewamo, Randolph

Taxonomic class: Fine, mixed, mesic Typic Argiaquolls

Typical Pedon
Millsdale silty clay loam, 0 to 1 percent slopes, about 3.5 miles northeast of Vanlue, in Biglick Township, about 2500 feet west and 460 feet south of the northeast corner of sec. 36, T. 1 N., R. 12 E.

Ap=0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium granular structure; firm; common fine and few medium roots; 1 percent rock fragments; neutral; clear smooth boundary.

A=9 to 13 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium subangular blocky structure; firm; common fine and few medium roots; few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few fine faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; abrupt smooth boundary.

Btg1=13 to 24 inches; dark gray (10YR 4/1) silty clay; moderate medium subangular blocky structure; firm; common fine and medium roots; common faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings lining worm and old root channels; common fine faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct dark yellowish brown (10YR 4/4) and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; 2 percent rock fragments; neutral; gradual wavy boundary.

Btg2=24 to 27 inches; gray (10YR 5/1) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and few medium roots; common faint gray (10YR 5/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining worm and old root channels; common fine and medium distinct dark yellowish brown (10YR 4/4) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; 2 percent rock fragments; neutral; clear wavy boundary.

Btg3=27 to 35 inches; gray (10YR 5/1) clay loam; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; common fine and few medium roots; common faint gray (10YR 5/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining worm channels; common fine faint light gray (10YR 6/1) iron depletions in the matrix; few medium distinct dark yellowish brown (10YR 4/4) and many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; 3 percent rock fragments; neutral; abrupt wavy boundary.

2R=35 inches; light gray (10YR 7/2) limestone.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 23 inches
Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2, 2.5, or 3, chroma of 1 or 2
Texture=silty clay loam
Content of rock fragments=0 to 15 percent

Btg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=silty clay, clay, silty clay loam, or clay loam
Content of rock fragments=1 to 15 percent

Milton Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Parent material: Till and the underlying residuum from limestone or dolostone
Landform: Flats, rises, and knolls on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils: Biglick, Millsdale, Morley, Randolph

Taxonomic class: Fine, mixed, mesic Typic Hapludalfs

Typical Pedon
Milton silt loam, 0 to 2 percent slopes, about 2.5 miles north-northeast of Vanlue, in Biglick Township, about 2200 feet west and 500 feet north of the southeast corner of sec. 26, T. 1 N., R. 12 E.

Ap=0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; 1 percent rock fragments; neutral; abrupt smooth boundary.

Bt1=10 to 15 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct brown (10YR 4/3) organic coatings lining worm channels; common distinct light brownish gray (10YR 6/2) clay depletions on vertical faces of peds; 1 percent rock fragments; neutral; clear wavy boundary.

Bt2=15 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 2 percent rock fragments; neutral; clear wavy boundary.

2Bt3=21 to 29 inches; brown (7.5YR 4/4) clay; strong medium and fine subangular blocky structure; firm; few fine roots; many distinct dark brown (10YR 3/3) clay

films on faces of peds; 5 percent highly and partially weathered limestone flagstones; neutral; abrupt irregular boundary.

2R=29 to 31 inches; light gray (10YR 7/2) limestone.

Range in Characteristics
Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam or loam
Content of rock fragments=0 to 5 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture=clay loam, silty clay loam, clay, or silty clay
Content of rock fragments=1 to 12 percent

2Bt horizon:
Color=hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, chroma of 2 to 6
Texture=clay or silty clay
Content of rock fragments=2 to 25 percent

Morley Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow or slow in the solum and slow or very slow in the till substratum
Parent material: Till; and in the limestone substratum phase, till overlying limestone or dolostone
Landform: Dissected areas on end moraines and ground moraines; the limestone substratum phase is on knolls and rises on monadnocks on ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 18 percent

Adjacent soils: Blount, Glynwood, Millsdale, Milton, Lybrand, Pewamo

Taxonomic class: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon
Morley loam, limestone substratum, 0 to 2 percent slopes, about 3 miles northeast of Vanlue, about 820 feet north and 1740 feet west of the southeast corner of sec. 36, Biglick Township, T. 1 N., R. 12 E.

Ap=0 to 8 inches; dark brown (10YR 3/3) loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine and few medium roots; 1 percent rock fragments; neutral; abrupt smooth boundary.

Bt1=8 to 12 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; few distinct brown (10YR 4/3) organic coatings on vertical faces of peds; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; neutral; gradual wavy boundary.

Bt2=12 to 17 inches; yellowish brown (10YR 5/4) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint brown (10YR 4/3) and brown (10YR 5/3) clay films on faces of peds; few medium faint brown (10YR 5/3) and few fine faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; slightly acid; clear wavy boundary.

Bt3=17 to 24 inches; dark yellowish brown (10YR 4/4) clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; few medium distinct yellowish brown (10YR 5/6) and few medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 3 percent rock fragments; neutral; clear wavy boundary.

Bt4=24 to 34 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; few medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; common faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on faces of peds; 5 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

BC=34 to 45 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots in the upper part; few distinct grayish brown (10YR 5/2) and brown (10YR 5/3) clay films on vertical faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on vertical faces of peds; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; 5 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

Cd=45 to 66 inches; dark yellowish brown (10YR 4/4) clay loam; massive, with widely spaced vertical fractures; very firm; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium faint yellowish brown (10YR 5/4) masses of iron accumulation along fractures; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of fractures; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2R=66 to 68 inches; light gray (10YR 7/2) limestone.

Range in Characteristics
Thickness of the solum: 30 to 48 inches
Depth to carbonates: 20 to 45 inches
Depth to dense material: 20 to 40 inches in the MpD3 map unit; 40 to 60 inches in the MrA and MsB map units
Depth to bedrock: Greater than 80 inches, and in the limestone substratum phase, 60 to 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam or clay loam
Content of rock fragments=0 to 10 percent

Bt horizon:
Color=hue of 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6
Texture=clay, silty clay, clay loam, or silty clay loam
Content of rock fragments=1 to 15 percent

Cd horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silty clay loam, or loam
Content of rock fragments=1 to 15 percent

Mortimer Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow in the solum and slow or very slow in the substratum
Parent material: Till
Landform: Knolls and dissected areas on end moraines
Position on the landform: Backslopes, shoulders
Slope: 2 to 6 percent

Adjacent soils: Hoytville, Nappanee, St. Clair

Taxonomic class: Fine, illitic, mesic Aquic Hapludalfs

Typical Pedon
Mortimer silt loam, 2 to 6 percent slopes, about 3 miles south of McComb, in Blanchard Township, about 2460 feet west and 1165 feet south of the northeast corner of sec. 12, T. 1 N., R. 9 E.

Ap=0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; common faint very dark grayish brown (10YR 3/2) iron and manganese oxide concretions in the matrix; 1 percent rock fragments; strongly acid; clear smooth boundary.

Bt1=8 to 13 inches; yellowish brown (10YR 5/4) silty clay; moderate fine and medium subangular blocky structure; firm; common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct light brownish gray (10YR 6/2) clay depletions on vertical faces of peds and in pores; common fine distinct very dark grayish brown (10YR 3/2) iron and manganese oxide concretions in the matrix; 1 percent rock fragments; strongly acid; clear wavy boundary.

Bt2=13 to 18 inches; dark yellowish brown (10YR 4/4) clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common distinct brown (10YR 4/3) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) iron and manganese oxide concretions in the matrix; 1 percent rock fragments; moderately acid; gradual wavy boundary.

Bt3=18 to 22 inches; dark yellowish brown (10YR 4/4) clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common distinct brown (10YR 4/3) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) iron and manganese oxide concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt4=22 to 28 inches; dark yellowish brown (10YR 4/4) silty clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; 1

percent rock fragments; strongly effervescent; slightly alkaline; clear smooth boundary.

Bt5=28 to 39 inches; dark yellowish brown (10YR 4/4) silty clay; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; 1 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=39 to 49 inches; dark yellowish brown (10YR 4/4) silty clay; weak medium and coarse subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) coatings on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

Cd=49 to 80 inches; dark yellowish brown (10YR 4/4) silty clay; massive, with widely spaced vertical fractures; very firm; few distinct grayish brown (10YR 5/2) coatings on faces of fractures; few medium distinct grayish brown (10YR 5/2) iron depletions along fractures; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation along fractures; common fine distinct very dark grayish brown (10YR 3/2) iron and manganese oxide concretions in the matrix; few distinct light gray (10YR 7/2) masses of calcium carbonate accumulation along fractures; 2 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 55 inches
Depth to carbonates: 17 to 35 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=silt loam or silty clay loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 6
Texture=silty clay or clay; some pedons have silty clay loam in the upper part of the Bt horizon
Content of rock fragments=0 to 5 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 6
Texture=silty clay or clay
Content of rock fragments=1 to 7 percent

Nappanee Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow in the solum, and slow or very slow in the substratum
Parent material: Till
Landform: Flats, rises, and dissected areas on lake plains
Position on the landform: Summits, shoulders, backslopes
Slope: 0 to 6 percent

Adjacent soils: Haskins, Hoytville, Mortimer, St. Clair

Taxonomic class: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon
Nappanee silty clay loam, 0 to 2 percent slopes, about 2 miles northwest of Deweyville, in Pleasant Township, about 240 feet north and 1460 feet west of the southeast corner of sec. 6, T. 2 N., R. 9 E.

Ap=0 to 8 inches; dark grayish brown (10YR 4/2) silty clay loam, pale brown (10YR 6/3) dry; weak medium and coarse subangular blocky structure parting to moderate medium granular; firm; few medium and common fine roots; few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation lining the interior of pores; 10 percent intermixing of brown (10YR 5/3) Bt material; 1 percent rock fragments; strongly acid; clear smooth boundary.

Bt=8 to 15 inches; brown (10YR 5/3) silty clay; moderate medium subangular blocky structure; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 1 percent rock fragments; strongly acid; gradual wavy boundary.

Btg1=15 to 24 inches; grayish brown (10YR 5/2) silty clay; strong fine and medium subangular blocky structure; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common faint very dark grayish brown (10YR 3/2) masses of iron and

manganese oxide accumulation on faces of peds; 1 percent rock fragments; neutral; gradual wavy boundary.

Btg2=24 to 32 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 2 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; gradual wavy boundary.

B't=32 to 40 inches; yellowish brown (10YR 5/4) clay; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; few fine and very fine roots in the upper part; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 2 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

BC=40 to 56 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; very firm; common distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd=56 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; very firm; few fine and medium distinct grayish brown (10YR 5/2) iron depletions oriented along fractures; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation oriented along faces of fractures; few medium distinct white (10YR 8/1) calcium carbonate concretions in the matrix; 3 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 18 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 1 to 3
Texture=silty clay loam or loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay or clay; some pedons have thin subhorizons of silty clay loam
Content of rock fragments=1 to 10 percent

BC or BCg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=clay loam, silty clay loam, clay, or silty clay
Content of rock fragments=2 to 10 percent

Cd or Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=clay loam, silty clay loam, clay, or silty clay
Content of rock fragments=2 to 10 percent

Oshtemo Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid in the solum and very rapid in the substratum; in the till substratum phase, permeability is slow or very slow in the till
Parent material: Stratified loamy, sandy, and gravelly deposits; and in the till substratum phase, stratified loamy, sandy, and gravelly deposits overlying till
Landform: Knolls and rises on outwash plains, and on beach ridges on lake plains
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 12 percent
Adjacent soils:
On beach ridges=Aurand, Fox, Shawtown
On outwash plains=Alvada, Lamberjack, Thackery, Westland

Taxonomic class: Coarse-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon
Oshtemo fine sandy loam, 2 to 6 percent slopes, about 3.75 miles west-southwest of McComb, in Pleasant Township, about 1940 feet west and 2460 feet north of the southeast corner of sec. 31, T. 2 N., R. 9 E.

Ap=0 to 10 inches; brown (10YR 4/3) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine and medium

granular structure; very friable; common fine roots; 5 percent rock fragments; strongly acid; clear smooth boundary.

Bt1=10 to 18 inches; dark yellowish brown (10YR 4/4) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; very friable; common fine roots; common faint brown (10YR 4/3) clay films on faces of peds and as bridging between sand grains; 5 percent rock fragments; strongly acid; gradual wavy boundary.

Bt2=18 to 27 inches; dark yellowish brown (10YR 4/4) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; very friable; few fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds and as bridging between sand grains; 7 percent rock fragments; moderately acid; gradual wavy boundary.

Bt3=27 to 34 inches; brown (7.5YR 4/4) coarse sandy loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds and as bridging between sand grains; 10 percent rock fragments; slightly acid; clear wavy boundary.

Bt4=34 to 43 inches; dark yellowish brown (10YR 3/4) gravelly sandy loam with thin strata of sandy loam; weak fine and medium subangular blocky structure; very friable; few bodies of sandy clay loam; few fine roots; common faint dark yellowish brown (10YR 3/4) clay as bridging between sand grains; tonguing of Bt4 material extends to depths of more than 80 inches; 17 percent rock fragments; neutral; abrupt irregular boundary.

C1=43 to 54 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose; 10 percent rock fragments; strongly effervescent; moderately alkaline; clear smooth boundary.

C2=54 to 80 inches; brown (10YR 5/3) gravelly coarse sand with strata of coarse sand; single grain; loose; 20 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 75 inches; 35 to 45 inches in OsB units on the Whittlesey beach ridge
Depth to carbonates: 40 to 70 inches
Depth to till: Greater than 80 inches; in the till substratum phase, 60 to 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 2 or 3
Texture=fine sandy loam or sandy loam
Content of rock fragments=1 to 15 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture=fine sandy loam, sandy loam, coarse sandy loam, sandy clay loam, loam, gravelly coarse sandy loam, gravelly sandy loam, or gravelly sandy clay loam
Content of rock fragments=1 to 30 percent

C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 2 to 6
Texture=coarse sand, loamy coarse sand, sand, or loamy sand, or the gravelly analogues of those textures, and is commonly stratified
Content of rock fragments=5 to 30 percent

2Cd or 2Cdg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 4
Texture=silty clay loam, clay loam, or clay
Content of rock fragments=1 to 7 percent

Ottokee Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Rapid
Parent material: Sandy deposits
Landform: Knolls and rises on outwash plains
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils: Adrian, Gilford

Taxonomic class: Mixed, mesic Aquic Udipsamments

Typical Pedon
Ottokee loamy fine sand, 0 to 6 percent slopes, about 4 miles northeast of Vanlue, in Biglick Township, about 2160 feet south and 740 feet west of the northeast corner of sec. 25, T. 1 N., R. 12 E.

Ap=0 to 11 inches; brown (10YR 4/3) loamy fine sand, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; few fine and medium roots; slightly acid; abrupt smooth boundary.

E1=11 to 21 inches; yellowish brown (10YR 5/6) loamy fine sand; single grain; loose; few fine roots; common medium distinct pale brown (10YR 6/3) and faint strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; gradual wavy boundary.

E2=21 to 36 inches; yellowish brown (10YR 5/6) loamy fine sand; single grain; loose; few fine roots; common medium prominent light brownish gray (10YR 6/2) iron depletions in the matrix; common medium faint strong brown (7.5YR 5/6) masses of iron accumulation in the

matrix; common fine prominent black (10YR 2/1) manganese oxide concretions in the matrix; moderately acid; gradual wavy boundary.

E and Bt=36 to 65 inches; pale brown (10YR 6/3) loamy fine sand in the E part and yellowish brown (10YR 5/4) loamy fine sand in the Bt part; E is single grain and loose, Bt is weak fine subangular blocky structure and very friable; few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common fine prominent black (10YR 2/1) masses of manganese oxide accumulation in the matrix; slightly acid; gradual wavy boundary.

C1=65 to 72 inches; brown (10YR 5/3) loamy fine sand with strata of loamy sand; single grain; loose; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

C2=64 to 80 inches; brown (10YR 5/3) loamy fine sand; single grain; loose; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics
Depth to first lamellae: 28 to 50 inches
Thickness of the solum: 40 to 90 inches
Depth to carbonates: 40 to 90 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loamy fine sand
Content of rock fragments=0 to 5 percent

E horizon:
Color=hue of 10YR or 7.5YR, value of 5 or 6, chroma of 4 to 8
Texture=loamy fine sand, fine sand, sand, or loamy sand
Content of rock fragments=0 to 5 percent

E and Bt horizon:
Color=E part: hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 3; Bt part: hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 4 to 8
Texture=E part: loamy fine sand, loamy sand, sand, or fine sand; Bt part: loamy fine sand or loamy sand
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 5 or 6, chroma of 0 to 3
Texture=fine sand, loamy fine sand, loamy sand, or sand
Content of rock fragments=0 to 5 percent

Patton Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate in the solum and moderately slow in the substratum
Parent material: Glaciolacustrine deposits
Landform: Flats and depressions on lake plains
Slope: 0 to 1 percent

Adjacent soils: Darroch, Del Rey, Shinrock

Taxonomic class: Fine-silty, mixed, mesic Typic Endoaquolls

Typical Pedon
Patton silty clay loam, 0 to 1 percent slopes, about 4.5 miles west of Benton Ridge, in Blanchard Township, about 590 feet east and 2580 feet south of the northwest corner of section 30, T. 1 N., R. 9 E.

Ap=0 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; firm; common fine and few medium roots; neutral; clear smooth boundary.

Bg1=12 to 20 inches; gray (10YR 5/1) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common distinct very dark gray (10YR 3/1) organic coatings on vertical faces of peds and in pores; common medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bg2=20 to 30 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct very dark gray (10YR 3/1) organic coatings on vertical faces of peds and in pores; common medium prominent strong brown (7.5YR 5/6) and few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bg3=30 to 35 inches; gray (10YR 5/1) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings in pores; few faint dark gray (10YR 4/1) coatings on vertical faces of peds; many medium and coarse prominent strong brown (7.5YR 5/6) and few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; slightly alkaline; clear wavy boundary.

Bg4=35 to 48 inches; gray (10YR 5/1) silty clay loam with strata of silt loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings in pores; few faint gray (10YR 5/1) coatings on vertical faces of peds; many medium distinct dark yellowish brown (10YR 4/4) and common medium and coarse prominent (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; slightly alkaline; gradual wavy boundary.

BCg=48 to 59 inches; gray (10YR 5/1) silt loam with strata of silty clay loam and loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint gray (10YR 5/1) coatings on vertical faces of peds; many medium distinct yellowish brown (10YR 5/4) and common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear wavy boundary.

C=59 to 80 inches; yellowish brown (10YR 5/4) silt loam with strata of loamy fine sand and loamy sand; massive; friable; common medium and coarse distinct dark gray (10YR 4/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments in loamy sand strata; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 18 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Depth to bedrock: Greater than 80 inches
Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=silty clay loam
Content of rock fragments=0 to 5 percent

Bg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 4 or 5, chroma of 0 to 2
Texture=silty clay loam
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 4
Texture=silt loam or silty clay loam, and is commonly stratified
Content of rock fragments=0 to 5 percent

Pewamo Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Till
Landform: Flats, depressions, and drainageways on end moraines, ground moraines, disintegration moraines, and lake plains
Slope: 0 to 2 percent

Adjacent soils: Blount, Elliott, Glynwood

Taxonomic class: Fine, mixed, mesic Typic Argiaquolls

Typical Pedon
Pewamo silty clay loam, 0 to 1 percent slopes, about 3 miles south of Findlay, in Eagle Township, about 920 feet south and 800 feet east of the northwest corner of sec. 2, T. 1 S., R. 10 E.

Ap=0 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium angular blocky structure parting to moderate medium and fine granular; firm; common fine and few medium roots; common faint very dark grayish brown (10YR 3/2) worm casts in pores; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent intermixed dark gray (10YR 4/1) Btg1 material; 1 percent rock fragments; slightly acid; abrupt smooth boundary.

Btg1=11 to 18 inches; dark gray (10YR 4/1) silty clay; moderate medium and fine subangular blocky structure; firm; common fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds, and lining old worm and root channels; common medium faint gray (10YR 5/1) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; few very dark grayish brown (10YR 3/2) krotovinas; 1 percent rock fragments; neutral; clear wavy boundary.

Btg2=18 to 24 inches; gray (10YR 5/1) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings in old root and worm channels; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; few very dark grayish brown (10YR 3/2) krotovinas; 1 percent rock fragments; neutral; gradual wavy boundary.

Btg3=24 to 31 inches; gray (10YR 5/1) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint gray (10YR 5/1) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings lining old root and worm

channels; common medium faint grayish brown (10YR 5/2) masses of iron accumulation in the matrix; few medium prominent strong brown (7.5YR 5/6) and common medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; few very dark grayish brown (10YR 3/2) krotovinas; 2 percent rock fragments; neutral; gradual wavy boundary.

Btg4=31 to 45 inches; gray (10YR 5/1) silty clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few faint gray (10YR 5/1) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings in old root channels; common coarse prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; few very dark grayish brown (10YR 3/2) krotovinas; 2 percent rock fragments; slightly alkaline; clear wavy boundary.

Bt=45 to 53 inches; dark yellowish brown (10YR 4/4) clay; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few distinct gray (10YR 5/1) clay films on vertical faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; few very dark grayish brown (10YR 3/2) krotovinas; 4 percent rock fragments; slightly alkaline; gradual wavy boundary.

BC=53 to 66 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent at 58 inches; moderately alkaline; gradual wavy boundary.

C1=66 to 74 inches; brown (10YR 4/3) clay loam; massive, with widely spaced vertical fractures; firm; few distinct gray (10YR 5/1) coatings on faces of fractures; common medium distinct gray (10YR 5/1) iron depletions oriented along fractures; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2=74 to 80 inches; brown (10YR 4/3) clay loam; massive, with widely spaced vertical fractures; firm; common medium faint grayish brown (2.5Y 5/2) iron depletions oriented along fractures; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 17 inches
Thickness of the solum: 28 to 70 inches
Depth to carbonates: 28 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=silty clay loam
Content of rock fragments=0 to 10 percent

Btg or Bt horizon:
Color=hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay, clay, silty clay loam, or clay loam
Content of rock fragments=1 to 10 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=clay loam or silty clay loam
Content of rock fragments=1 to 15 percent

Randolph Series

Depth class: Moderately deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Till overlying limestone or dolostone
Landform: Rises on ground moraines and on monadnocks on ground moraines
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent

Adjacent soils: Millsdale, Milton

Taxonomic class: Fine, mixed, mesic Aeric Endoaqualfs

Typical Pedon
Randolph silt loam, 0 to 2 percent slopes, about 1 mile south of Findlay, in Liberty Township, about 140 feet west and 1300 feet north of the southeast corner of sec. 26, T. 1 N., R. 10 E.

Ap=0 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very pale brown (10YR 7/3) dry; moderate fine and medium granular structure; friable; common fine and few medium roots; 10 percent intermixing of dark yellowish brown (10YR 4/4) Bt1 material; 1 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1=11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and fine subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings lining old root channels; many medium distinct gray (10YR 5/1) iron depletions in the matrix; common medium and coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 2 percent rock fragments; strongly acid; clear wavy boundary.

Bt2=15 to 18 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium and fine subangular blocky structure; firm; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; strongly acid; gradual wavy boundary.

Btg=18 to 25 inches; dark grayish brown (10YR 4/2) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine and medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; neutral; abrupt wavy boundary.

2R=25 to 27 inches; light gray (10YR 7/2) limestone.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches

Ap horizon
Color=hue of 10YR or 2.5Y , value of 4 or 5 , chroma of 1 to 3
Texture=silt loam
Content of rock fragments=0 to 3 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=silty clay loam, silty clay, clay loam, or clay
Content of rock fragments=0 to 3 percent in the upper part and 2 to 15 percent in the lower part

Rawson Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum and slow or very slow in the lower part of the solum and in the substratum
Parent material: Loamy deposits and the underlying till
Landform: Knolls on lake plains
Position on the landform: Backslopes, shoulders
Slope: 2 to 6 percent

Adjacent soils: Rimer, Oshtemo

Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Hapludalfs

Typical Pedon
Rawson sandy loam, 2 to 6 percent slopes, about 1.5 miles east of Wauseon, in Fulton County, Ohio, York Township, about 320 feet south and 2300 east of the northwest corner of sec. 30, T. 7 N., R. 7 E.

Ap=0 to 10 inches; brown (10YR 4/3) sandy loam; pale brown (10YR 6/3) dry; weak medium granular structure; friable; few fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1=10 to 19 inches; yellowish brown (10YR 5/4) sandy loam; common medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; few fine roots; thin very patchy brown (10YR 4/3) clay films on faces of peds and as clay bridging between sand grains; 10 percent rock fragments; slightly acid; abrupt smooth boundary.

Bt2=19 to 28 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; firm; few fine roots; many faint dark brown (10YR 4/3) clay films on faces of peds; 10 percent rock fragments; neutral; gradual wavy boundary.

Bt3=28 to 32 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common faint very dark grayish brown (10YR 3/2) iron and manganese oxide stains on faces of peds; 10 percent rock fragments; neutral; abrupt smooth boundary.

2Bt4=32 to 36 inches; dark brown (10YR 4/3) clay loam; weak medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 5 percent rock fragments; neutral; abrupt wavy boundary.

2C=36 to 60 inches; brown (10YR 5/3) clay loam; massive, with widely spaced vertical fractures; very firm; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) calcium carbonate coatings on faces of fractures; 3 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 24 to 48 inches
Depth to carbonates: 24 to 48 inches
Depth to till: 20 to 40 inches
Depth to dense material: 24 to 48 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=sandy loam
Content of rock fragments=0 to 15 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 to 6
Texture=clay loam, sandy clay loam, sandy loam, or loam, or the gravelly analogues of those textures
Content of rock fragments=2 to 25 percent

2Bt or 2Btg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 1 to 6
Texture=clay loam, silty clay loam, or clay
Content of rock fragments=1 to 10 percent

2C or 2Cg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 1 to 6
Texture=clay loam, silty clay loam, or clay
Content of rock fragments=1 to 10 percent

Rensselaer Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate; in the till substratum phase, moderate in the solum and slow or moderately slow in the substratum
Parent material: Loamy deposits; in the till substratum phase, loamy deposits overlying till
Landform: Flats, depressions, and drainageways on lake plains, outwash plains, ground moraines, and glacial drainage channels
Slope: 0 to 1 percent

Adjacent soils: Jenera, Pewamo, Tiderishi, Vanlue, Westland

Taxonomic class: Fine-loamy, mixed, mesic Typic Argiaquolls

Typical Pedon
Rensselaer loam, till substratum, 0 to 1 percent slopes, about 3.5 miles west-southwest of Benton Ridge, in Union Township, about 2440 feet east and 2200 feet south of the northwest corner of sec. 5, T. 1 S., R. 9 E.

Ap=0 to 12 inches; very dark gray (10YR 3/1) loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; few medium and common fine roots; few faint dark brown (7.5YR 3/2) moderately cemented iron and manganese concretions in the matrix; slightly acid; clear smooth boundary.

Btg1=12 to 16 inches; dark gray (10YR 4/1) loam; moderate fine and medium subangular blocky structure; friable; few medium and common fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) and brown (7.5YR 4/4) masses of iron accumulation in the matrix; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; few very dark gray (10YR 3/1) krotovinas; neutral; gradual wavy boundary.

Btg2=16 to 23 inches; gray (10YR 5/1) loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common faint gray (10YR 5/1) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) and common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine and medium distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; few very dark gray (10YR 3/1) krotovinas; neutral; clear wavy boundary.

Btg3=23 to 35 inches; grayish brown (10YR 5/2) clay loam with strata of loam and silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common faint gray (10YR 5/1) clay films on faces of peds; common fine and medium faint gray (10YR 5/1) iron depletions in the matrix; common medium and coarse prominent strong brown (7.5YR 5/6) and common medium and coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; few very dark gray (10YR 3/1) krotovinas; neutral; gradual wavy boundary.

Bt=35 to 46 inches; yellowish brown (10YR 5/4) clay loam with strata of loam and silty clay loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; common faint gray (10YR 5/1) clay films on faces of peds; common fine and medium distinct gray (10YR 5/1) and many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; few very dark gray (10YR 3/1) krotovinas; neutral; clear wavy boundary.

BC=46 to 54 inches; yellowish brown (10YR 5/4) loam with strata of fine sandy loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) and many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine and medium distinct strong brown (7.5YR 5/6) and common medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; slightly alkaline; clear wavy boundary.

Cg1=54 to 63 inches; dark grayish brown (10YR 4/2) loamy sand with strata of silt loam, silty clay loam, and fine sandy loam; single grain; loose; common medium and coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2Cg2=63 to 80 inches; dark gray (10YR 4/1) clay loam; massive; firm; few fine and medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 12 to 18 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Depth to till: Greater than 80 inches; 60 to 80 inches in the till substratum phase
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 1 or 2
Texture=loam
Content of rock fragments=0 to 5 percent

Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture=loam, clay loam, silty clay loam, sandy clay loam, or fine sandy loam
Content of rock fragments=0 to 5 percent

Bt horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=loam, clay loam, sandy clay loam, or fine sandy loam
Content of rock fragments=0 to 5 percent

Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 or 2
Texture=loamy sand, loamy fine sand, sandy loam, fine sandy loam, loam, silt loam, or sand, and is commonly stratified
Content of rock fragments=0 to 10 percent

2C or 2Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=clay loam or silty clay loam
Content of rock fragments=1 to 7 percent

Rimer Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Rapid in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum; deep phase is rapid in the upper part of the solum, moderately rapid in the lower part of the solum, rapid in the upper part of the substratum, and slow or moderately slow in the lower part of the substratum
Parent material: Sandy deposits and the underlying till
Landform: Rises on lake plains
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent
Adjacent soils: Haskins, Mermill, Oshtemo; and for the deep phase, Arkport, Rensselaer, Tiderishi

Taxonomic class: Loamy, mixed, mesic Aquic Arenic Hapludalfs

Typical Pedon
Rimer loamy sand, 0 to 2 percent slopes, about 4.5 miles west of Van Buren, in Portage Township, about 1780 feet north and 1380 feet west of the southeast corner of sec. 5, T. 2 N., R. 10 E.

Ap=0 to 10 inches; dark brown (10YR 3/3) loamy sand, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; very friable; common fine roots; 5 percent intermixing of yellowish brown (10YR 5/4) E1 material; moderately acid; abrupt smooth boundary.

E1=10 to 17 inches; yellowish brown (10YR 5/4) loamy sand; weak fine and medium subangular blocky structure; very friable; common fine roots; common medium and coarse faint brown (10YR 5/3) iron depletions in the matrix; common medium and coarse faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.

E2=17 to 23 inches; brown (10YR 5/3) loamy sand; weak fine and medium subangular blocky structure; very friable; few fine roots; common fine and medium prominent strong brown (7.5YR 5/6) and few medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; moderately acid; clear wavy boundary.

Bt=23 to 28 inches; dark yellowish brown (10YR 4/4) sandy loam with thin strata of loamy sand and sandy clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; neutral; abrupt wavy boundary.

2Btg=28 to 35 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; few fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine and medium faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) and few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few faint very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; common fine and medium faint very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

2Bt=35 to 40 inches; dark yellowish brown (10YR 4/4) clay; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; common distinct gray (10YR 6/1) clay films on faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; few medium faint pale brown (10YR 6/3) moderately cemented calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

2BC=40 to 54 inches; dark yellowish brown (10YR 4/4) clay; weak medium and coarse subangular blocky structure; very firm; common distinct gray (10YR 6/1) coatings on vertical faces of peds; common fine and medium distinct gray (10YR 5/1) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few faint pale brown (10YR 6/3) masses of calcium carbonate accumulation on vertical faces of peds; few fine and medium faint pale brown (10YR 6/3) moderately cemented calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

2Cd=54 to 80 inches; dark yellowish brown (10YR 4/4) clay; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 6/1) coatings on faces of fractures; common fine and medium distinct gray (10YR 5/1) iron depletions oriented along fractures; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; few fine and medium faint pale brown (10YR 6/3) moderately cemented calcium carbonate concretions in the matrix; 5 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the sandy material: 20 to 32 inches
Thickness of the solum: 25 to 55 inches
Depth to carbonates: 25 to 45 inches; ranges to 55 inches in the deep phase
Depth to till: 25 to 40 inches; 40 to 60 inches in the deep phase
Depth to dense material: 40 to 60 inches; greater than 80 inches in the deep phase
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 to 5, chroma of 1 to 3
Texture=loamy sand or loamy fine sand
Content of rock fragments=0 to 3 percent

E or Eg horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 4
Texture=loamy sand or loamy fine sand
Content of rock fragments=0 to 3 percent

Bt or Btg horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 2 to 6
Texture=sandy loam or fine sandy loam
Content of rock fragments=0 to 3 percent

2Bt or 2Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay, clay, clay loam, or silty clay loam
Content of rock fragments=1 to 8 percent

2Cd or 2Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silty clay, clay, clay loam, or silty clay loam
Content of rock fragments=1 to 8 percent
3C or 3Cg horizon (in deep phase):
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=loamy sand, sandy loam
Content of rock fragments=1 to 8 percent

4C or 4Cg horizon (in deep phase):
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=loam, clay loam, or silty clay loam
Content of rock fragments=1 to 8 percent

Rossburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the solum and moderately rapid in the substratum
Parent material: Alluvium
Landform: Natural levees, flats, and rises on flood plains
Slope: 0 to 2 percent

Adjacent soils: Medway, Sloan

Taxonomic class: Fine-loamy, mixed, mesic Fluventic Hapludolls

Typical Pedon
Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded, about 3.25 miles south-southeast of McComb, in Liberty Township, about 1200 feet west and 1880 feet south of the northeast corner of sec. 7, T. 1 N., R. 10 E.

Ap=0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; few fine roots; 1 percent rock fragments; neutral; gradual smooth boundary.

A=7 to 13 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; few fine roots; 1 percent rock fragments; neutral; clear wavy boundary.

Bw1=13 to 21 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 1 percent rock fragments; neutral; gradual smooth boundary.

Bw2=21 to 33 inches; dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; firm; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; common faint brown (10YR 4/3) coatings on faces of peds; 1 percent rock fragments; neutral; gradual wavy boundary.

Bw3=33 to 45 inches; dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) coatings on faces of peds; 1 percent rock fragments; neutral; gradual wavy boundary.

Bw4=45 to 56 inches; brown (10YR 4/3) loam; weak medium and coarse subangular blocky structure; friable; few fine roots; few faint dark grayish brown (10YR 4/2) coatings on faces of peds; few fine faint brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

C1=56 to 71 inches; brown (10YR 4/3) loam with strata of sandy loam; massive; very friable; few fine distinct yellowish brown (10YR 5/6) and few fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; 1 percent rock fragments; slightly alkaline; clear wavy boundary.

C2=71 to 80 inches; brown (10YR 5/3) sandy loam; massive; very friable; common fine distinct light gray (10YR 7/1) aquatic shells; 2 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the solum: 24 to 60 inches
Depth to carbonates: 40 to more than 80 inches
Depth to bedrock: Greater than 80 inches

A horizon:
Color=hue of 10YR, value of 2 or 3, chroma of 2 or 3
Texture=silt loam or loam
Content of rock fragments=0 to 5 percent

Bw horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 2 to 6
Texture=silt loam or loam
Content of rock fragments=0 to 10 percent

C horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 3 to 6
Texture=loam, sandy loam, silt loam, or fine sandy loam, or the gravelly analogues of those textures
Content of rock fragments=0 to 35 percent

Shawtown Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the loamy solum, rapid in the sandy and gravelly substratum, and slow or very slow in the till substratum
Parent material: Stratified glaciolacustrine or water-sorted deposits overlying till
Landform: Flats, rises, and knolls on beach ridges on lake plains, on outwash plains, and on

outwash areas on end moraines and ground moraines
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils:
On beach ridges=Aurand, Cygnet, Oshtemo
On outwash plains=Alvada, Lamberjack, Thackery
On moraines=Blount, Glynwood, Houcktown

Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Hapludalfs

Typical Pedon
Shawtown loam, 2 to 6 percent slopes, about 1 mile west of McComb, in Pleasant Township, about 2280 feet east and 280 feet south of the northwest corner of sec. 27, T. 2 N., R. 9 E.

Ap=0 to 9 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; few fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.

Bt1=9 to 21 inches; dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 10 percent rock fragments; strongly acid; gradual wavy boundary.

Bt2=21 to 33 inches; dark yellowish brown (10YR 4/4) gravelly clay loam with strata of clay loam; moderate medium subangular blocky structure; friable; few fine roots; many faint brown (10YR 4/3) clay films on faces of peds; 15 percent rock fragments; neutral; clear wavy boundary.

Bt3=33 to 48 inches; yellowish brown (10YR 5/4) gravelly loam; moderate medium subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) and common medium faint brown (10YR 5/3) iron depletions in the matrix; 20 percent rock fragments; neutral; clear wavy boundary.

Bt4=48 to 55 inches; brown (10YR 5/3) gravelly loam with strata of gravelly sandy loam; weak medium and coarse subangular blocky structure; very friable; common faint brown (10YR 5/3) clay films on faces of peds and as bridging between sand grains; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 20 percent rock fragments; slightly effervescent discontinuously in the lower part; neutral; clear wavy boundary.

Cg=55 to 63 inches; grayish brown (10YR 5/2) gravelly loamy coarse sand with strata of loamy sand; single grain; loose; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 20 percent rock fragments; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cd=63 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive, with widely spaced vertical fractures; very firm; common fine distinct gray (10YR 5/1) iron depletions oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 35 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to till: 50 to 70 inches
Depth to dense material: 50 to 70 inches
Depth to bedrock: Greater than 80 inches
Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=1 to 14 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 3 to 5, chroma of 3 to 6
Texture=loam, clay loam, sandy clay loam, or coarse sandy loam, or the gravelly analogues of those textures
Content of rock fragments=5 to 25 percent

C or Cg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 4
Texture=loamy sand, loamy coarse sand, coarse sandy loam, or sandy loam, or the gravelly or very gravelly analogues of those textures
Content of rock fragments=5 to 45 percent
2Cd or 2Cdg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=clay loam, silt loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Shinrock Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part of the solum and moderate or moderately slow in the lower part of the solum and in the substratum; and in the till substratum phase, slow or very slow in the till
Parent material: Glaciolacustrine deposits, and in the till substratum phase, glaciolacustrine deposits overlying till
Landform: Knolls and dissected areas on lake plains and disintegration moraines

Position on the landform: Backslopes, shoulders, summits
Slope: 1 to 12 percent
Adjacent soils: Del Rey, Glynwood, Jenera, Patton, Pewamo

Taxonomic class: Fine, illitic, mesic Aquic Hapludalfs

Typical Pedon
Shinrock silt loam, 2 to 6 percent slopes, about 3 miles south-southeast of McComb, in Liberty Township, about 1780 feet east and 820 feet south of the northwest corner of sec. 7, T. 1 N., R. 10 E.

Ap=0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; common fine roots; moderately acid; clear smooth boundary.

Bt1=8 to 12 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; moderately acid; gradual wavy boundary.

Bt2=12 to 18 inches; dark yellowish brown (10YR 4/4) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; moderately acid; gradual wavy boundary.

Bt3=18 to 29 inches; dark yellowish brown (10YR 4/4) silty clay; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; common faint brown (10YR 4/3) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; slightly acid; clear smooth boundary.

Bt4=29 to 33 inches; brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; common distinct very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of peds; strongly effervescent; slightly alkaline; clear smooth boundary.

BC1=33 to 36 inches; brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; firm; few fine roots; common faint dark yellowish brown (10YR 4/4) coatings on vertical faces of prisms; few fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many distinct very pale brown (10YR 7/3) masses of calcium carbonate accumulation on vertical faces of peds; few medium distinct very pale brown (10YR 7/3) moderately cemented calcium carbonate nodules and concretions in the matrix; strongly effervescent; slightly alkaline; clear smooth boundary.

BC2=36 to 50 inches; yellowish brown (10YR 5/4) silt loam with thin strata of silty clay loam and fine sandy loam; weak medium and coarse subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) coatings on vertical faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct very pale brown (10YR 7/3) moderately cemented calcium carbonate concretions in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.

C=50 to 80 inches; yellowish brown (10YR 5/4) silt loam with thin strata of very fine sand; massive; friable; few faint dark yellowish brown (10YR 4/4) coatings on faces of fractures; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct very pale brown (10YR 7/3) moderately cemented calcium carbonate concretions in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 25 to 55 inches
Depth to carbonates: 20 to 45 inches
Depth to till: Greater than 80 inches; in the till substratum phase, 60 to 80 inches
Depth to dense material: 60 to 80 inches in the till substratum phase
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam or silty clay loam

Bt horizon:
Color=hue of 10YR, 7.5YR, or 2.5Y, value of 4 or 5, chroma of 3 to 6
Texture=silty clay, silty clay loam, clay, or clay loam

C or Cg horizon:
Color=hue of 10YR, 7.5YR, 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=silt loam or silty clay loam, and is commonly stratified, with strata ranging from very fine sand to silty clay

2Cd or 2Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=silty clay loam or clay loam
Content of rock fragments=1 to 7 percent

Shoals Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Alluvium
Landform: Flats and rises on flood plains
Slope: 0 to 2 percent

Adjacent soils: Flatrock, Knoxdale, Sloan

Taxonomic class: Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents

Typical Pedon
Shoals silt loam, 0 to 2 percent slopes, occasionally flooded, about 1.2 miles northwest of Van Buren, in Allen Township, about 1380 feet east and 280 feet south of the northwest corner of sec. 12, T. 2 N., R. 10 E.

Ap=0 to 11 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium and coarse subangular blocky structure parting to moderate fine and medium granular; friable; few coarse, and common fine and medium roots; neutral; clear smooth boundary.

Bg=11 to 16 inches; grayish brown (10YR 5/2) silt loam; weak fine and medium subangular blocky structure; friable; common fine roots; common faint grayish brown (10YR 5/2) coatings on faces of peds; common fine and medium distinct dark yellowish brown (10YR 4/4) and few fine prominent (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear wavy boundary.

Bw1=16 to 21 inches; brown (10YR 5/3) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint grayish brown (10YR 5/2) coatings on faces of peds; common medium and coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint dark yellowish brown (10YR 4/4) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bw2=21 to 32 inches; dark yellowish brown (10YR 4/4) silt loam with thin strata of loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct dark grayish brown (10YR 4/2) coatings in pores and old root channels; many distinct grayish brown (10YR 5/2) coatings on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bw3=32 to 41 inches; brown (10YR 5/3) loam; moderate medium subangular blocky structure; friable; few fine roots; few distinct dark grayish brown (10YR 4/2) coatings in pores and old root channels; common faint grayish brown (10YR 5/2) coatings on faces of peds; common medium and coarse faint (10YR 5/2) iron depletions in the matrix; common medium faint dark yellowish brown (10YR 4/4) and common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear smooth boundary.

B'g=41 to 59 inches; grayish brown (2.5Y 5/2) silt loam; weak medium subangular blocky structure; friable; few fine roots; few distinct (10YR 4/2) coatings in pores, old root channels, and on vertical faces of peds; common distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual smooth boundary.

Cg=59 to 80 inches; grayish brown (2.5Y 5/2) loam with strata of silt loam and sandy loam; massive; friable; few medium and coarse prominent strong brown (7.5YR 5/6) and common medium and coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 10 percent rock fragments in the sandy loam strata; slightly alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 60 to more than 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=silt loam
Content of rock fragments=0 to 5 percent

Bg or Bw horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silt loam, loam, silty clay loam, or clay loam, and is commonly stratified
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 5 or 6, chroma of 1 to 6
Texture=loam, sandy loam, fine sandy loam, or silt loam, and is commonly stratified
Content of rock fragments=0 to 15 percent

Sloan Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate or moderately slow
Parent material: Alluvium, and in the limestone substratum phase, alluvium overlying limestone or dolostone
Landform: Flats and backswamps on flood plains
Slope: 0 to 1 percent

Adjacent soils: Flatrock, Knoxdale, Medway, Rossburg, Shoals

Taxonomic class: Fine-loamy, mixed, mesic Fluvaquentic Endoaquolls

Typical Pedon
Sloan silty clay loam, 0 to 1 percent slopes, occasionally flooded, about 3.5 miles northwest of Benton Ridge, in Blanchard Township, about 2240 feet north and 740 feet east of the southwest corner of sec. 16, T. 1 N., R. 9 E.

Ap=0 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; firm; common fine roots; 2 percent rock fragments; neutral; clear smooth boundary.

Bg1=11 to 21 inches; dark gray (10YR 4/1) clay loam; weak fine and medium subangular blocky structure; firm; common fine roots; many faint dark gray (10YR 4/1) coatings on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; 2 percent rock fragments; neutral; gradual wavy boundary.

Bg2=21 to 27 inches; dark gray (10YR 4/1) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) coatings on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) and few fine and medium prominent (7.5YR 5/6) masses of iron accumulation in the matrix; few very dark gray (10YR 3/1) krotovinas; 2 percent rock fragments; neutral; clear wavy boundary.

Bg3=27 to 32 inches; gray (10YR 5/1) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) coatings on faces of peds; common medium distinct dark yellowish brown (10YR 4/4) and common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few dark gray (10YR 4/1) krotovinas; 2 percent rock fragments; neutral; gradual wavy boundary.

Bg4=32 to 47 inches; gray (10YR 5/1) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) coatings on faces of peds; common medium and coarse distinct dark yellowish brown (10YR 4/4) and few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few dark gray (10YR 4/1) krotovinas; 3 percent rock fragments; neutral; gradual wavy boundary.

Bg5=47 to 58 inches; gray (10YR 5/1) clay loam with strata of clay; weak medium and coarse subangular blocky structure; firm; few faint gray (10YR 5/1) coatings on faces of peds; common medium and coarse prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 4 percent rock fragments; neutral; gradual wavy boundary.

Cg1=58 to 75 inches; gray (10YR 5/1) loam with strata of clay loam; massive; firm; common medium and coarse prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 4 percent rock fragments; neutral; abrupt wavy boundary.

Cg2=75 to 80 inches; gray (10YR 5/1) silty clay loam with thin strata of silt loam and silty clay; massive; firm; common medium distinct dark yellowish brown (10YR 4/4) and common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent rock fragments; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 60 to more than 80 inches
Depth to bedrock: Greater than 80 inches; in the limestone substratum phase, 60 to 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2 or 3, chroma of 1 or 2
Texture=silty clay loam or loam
Content of rock fragments=0 to 5 percent

Bg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 4 or 5, chroma of 0 to 2
Texture=clay loam, silty clay loam, loam, or silt loam
Content of rock fragments=0 to 5 percent

C or Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=clay loam, silty clay loam, loam, or sandy loam, or the gravelly analogues of those textures, and is commonly stratified
Content of rock fragments=0 to 20 percent

St. Clair Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow in the solum and slow or very slow in the substratum
Parent material: Till
Landform: Dissected areas on lake plains; knolls and dissected areas on end moraines
Position on the landform: Shoulders, backslopes
Slope: 2 to 12 percent

Adjacent soils: Hoytville, Mortimer, Nappanee

Taxonomic class: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon
St. Clair silty clay loam, 2 to 6 percent slopes, eroded, about 4 miles southwest of McComb, in Blanchard Township, about 180 feet east and 460 feet north of the southwest corner of sec. 8, T. 1 N., R. 9 E.

Ap=0 to 4 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; weak medium and coarse subangular blocky structure parting to moderate medium granular; firm; few coarse, and common fine and medium roots; 15 percent intermixing of yellowish brown (10YR 5/4) Bt1 material; 1 percent rock fragments; slightly acid; gradual smooth boundary.

Bt1=4 to 10 inches; yellowish brown (10YR 5/4) silty clay; weak medium subangular blocky structure; firm; common fine and medium roots; common faint brown (10YR 5/3) clay films on faces of peds; common fine and medium faint dark yellowish brown (10YR 4/4) and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint brown (10YR 5/3) iron depletions in the matrix; common distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; neutral; clear wavy boundary.

Bt2=10 to 19 inches; yellowish brown (10YR 5/4) silty clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; common faint brown (10YR 5/3) clay films on faces of peds; common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common medium faint brown (10YR 5/3) iron depletions in the matrix; common distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; slightly alkaline; gradual wavy boundary.

Bt3=19 to 27 inches; yellowish brown (10YR 5/4) silty clay; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common faint brown (10YR 5/3) and few distinct grayish brown (10YR 5/2) clay films on faces of peds;; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium faint dark yellowish brown (10YR 4/4) and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; few faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of peds 3 percent rock fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

Bt4=27 to 37 inches; yellowish brown (10YR 5/4) silty clay; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common faint brown (10YR 5/3) clay films on faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide on faces of peds; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of peds; 4 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

BC=37 to 48 inches; yellowish brown (10YR 5/4) silty clay; moderate coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; common faint very pale brown (10YR 7/3) masses of calcium carbonate accumulation on faces of peds; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual irregular boundary.

Cd=48 to 80 inches; yellowish brown (10YR 5/4) silty clay; massive, with widely spaced fractures; firm; common distinct gray (10YR 5/1) coatings on faces of fractures; few fine distinct grayish brown (10YR 5/2) iron depletions oriented along fractures; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; few distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of fractures; common distinct light gray (10YR 7/2) masses of

calcium carbonate accumulation on faces of fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 20 to 55 inches
Depth to carbonates: 18 to 30 inches
Depth to dense material: 20 to 55 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 7.5YR, value of 3 or 4, chroma of 2 or 3
Texture=silty clay loam
Content of rock fragments=0 to 7 percent

Bt horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 3 or 4
Texture=silty clay or clay
Content of rock fragments=1 to 7 percent

Cd or Cdg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 1 to 4
Texture=silty clay, clay, silty clay loam, or clay loam
Content of rock fragments=1 to 15 percent

Thackery Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the loamy solum, rapid or very rapid in the gravelly substratum, and slow or very slow in the till substratum
Parent material: Loamy, sandy, and gravelly deposits overlying till
Landform: Rises and flats on outwash plains and stream terraces
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent

Adjacent soils: Alvada, Lamberjack, Oshtemo, Shawtown

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Thackery loam, till substratum, 0 to 2 percent slopes, about 4 miles east of Findlay, in Marion Township, about 1480 feet south and 380 feet east of the northwest corner of sec. 12, T. 1 N., R. 11 E.

Ap=0 to 10 inches; dark grayish brown (10YR 4/2) loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; few fine roots; 5 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=10 to 17 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint brown (10YR 5/3) clay films on faces of peds; common medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common medium faint brown (10YR 5/3) iron depletions in the matrix; 10 percent rock fragments; slightly acid; gradual wavy boundary.

Bt2=17 to 25 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; few fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on the faces of peds; 12 percent rock fragments; neutral; clear wavy boundary.

Bt3=25 to 35 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 17 percent rock fragments; neutral; gradual wavy boundary.

Bt4=35 to 46 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 20 percent rock fragments; slightly alkaline; gradual wavy boundary.

Bt5=46 to 51 inches; brown (10YR 5/3) gravelly clay loam; weak medium subangular blocky structure; friable; few fine roots; many faint grayish brown (10YR 5/3) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) and few medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 17 percent rock fragments; slightly alkaline; clear wavy boundary.

Bt6=51 to 56 inches; brown (10YR 5/3) gravelly clay loam; weak medium subangular blocky structure; very friable; common faint grayish brown (10YR 5/2) clay films on faces of peds and clay bridging between sand grains; many medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation

in the matrix; 22 percent rock fragments; slightly effervescent discontinuously in the matrix; slightly alkaline; abrupt smooth boundary.

Cg=56 to 69 inches; grayish brown (10YR 5/2) gravelly loamy coarse sand with strata of loamy sand; single grain; loose; few medium and coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 20 percent rock fragments; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cdg=69 to 80 inches; dark gray (2.5Y 4/1) clay loam; massive; very firm; few medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 40 to 60 inches
Depth to till: 60 to 80 inches
Depth to dense material: 60 to 80 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 7.5YR, value of 4 or 5, chroma of 2 to 6
Texture=clay loam, loam, or sandy clay loam, or the gravelly analogues of those textures
Content of rock fragments=2 to 25 percent

C or Cg horizon:
Color=hue of 10YR, value of 4 to 6, chroma of 1 to 4
Texture=gravelly or very gravelly analogues of loamy sand, sand, or loamy coarse sand, and is commonly stratified
Content of rock fragments=15 to 30 percent

2Cd or 2Cdg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 1 to 4
Texture=clay loam, loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Tiderishi Series

Depth Class: Very deep
Drainage Class: Somewhat poorly drained
Permeability: Moderate in the solum, and moderately slow or slow in the substratum
Parent Material: Stratified loamy glaciolacustrine deposits overlying till
Landform: Rises and flats on lake plains
Position on the landform: Summits
Slope: 0 to 2 percent

Adjacent soils: Jenera, Rensselaer, Vanlue

Taxonomic class: Fine-loamy, mixed, mesic Aquic Argiudolls

Typical Pedon:
Tiderishi loam, 0 to 2 percent slopes, about 4 miles west-southwest of Benton Ridge, in Union Township, about 380 feet north and 2280 feet east of the southwest corner of sec. 6, T. 1 S., R. 9 E.

Ap=0 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; many fine and medium roots; 2 percent rock fragments; moderately acid; clear smooth boundary.

A=9 to 11 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common fine and medium roots; few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; moderately acid; clear wavy boundary.

Bt1=11 to 18 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine and medium distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 2 percent rock fragments; moderately acid; gradual wavy boundary.

Bt2=18 to 28 inches; yellowish brown (10YR 5/4) clay loam with thin strata of loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse distinct (7.5YR 5/6) masses of iron accumulation in the matrix; common medium distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese concretions in the matrix; 2 percent rock fragments; slightly acid; gradual wavy boundary.

Bt3=28 to 36 inches; brown (10YR 5/3) loam; moderate fine and medium subangular blocky structure; friable; common fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; common medium and coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; 3 percent rock fragments; neutral; clear wavy boundary.

Bt4=36 to 42 inches; yellowish brown (10YR 5/4) loam with thin strata of silty clay loam; weak medium subangular blocky structure; friable; few fine roots; common distinct grayish brown (10YR 5/2) clay films on faces of peds; many medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear wavy boundary.

Bt5=42 to 49 inches; brown (10YR 5/3) fine sandy loam with strata of loamy fine sand; weak medium subangular blocky structure; very friable; few fine roots; few faint grayish brown (10YR 5/2) clay films on faces of peds and as bridging between sand grains; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint very dark grayish brown (10YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; abrupt wavy boundary.

BC=49 to 57 inches; yellowish brown (10YR 5/4) silt loam; weak medium platy structure; friable; few distinct grayish brown (10YR 5/2) coatings on vertical faces of peds; common medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few medium distinct light gray (10YR 7/2) calcium carbonate concretions in the matrix; 2 percent rock fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

2C=57 to 80 inches; dark yellowish brown (10YR 4/4) clay loam; massive, with widely spaced vertical fractures; firm; few fine distinct grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to till: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap and A horizons:
Color=hue of 10YR or 2.5Y, or is neutral, value of 2, 2.5, or 3, chroma of 0 to 2
Texture=loam
Content of rock fragments=0 to 5 percent

Bt or Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 2 to 4
Texture=loam, clay loam, silty clay loam, silt loam, sandy clay loam, or fine sandy loam, and is commonly stratified
Content of rock fragments=0 to 10 percent

2C or 2Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 to 4
Texture=silt loam, clay loam, loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Toledo Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Slow
Parent material: Glaciolacustrine deposits
Landform: Depressions and drainageways on lake plains
Slope: 0 to 1 percent

Adjacent soils: Fulton, Lucas
Taxonomic class: Fine, illitic, nonacid, mesic, Mollic Endoaquepts

Typical Pedon
Toledo silty clay loam, 0 to 1 percent slopes, about 3 miles northeast of Gilboa, in Blanchard Township, about 120 feet south and 160 feet east of the northwest corner of sec. 18, T. 1 N., R. 9 E.

Ap=0 to 9 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine granular structure; firm; common fine roots; neutral; abrupt smooth boundary.

Bg1=9 to 22 inches; grayish brown (10YR 5/2) silty clay; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint gray (10YR 5/1) coatings on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium distinct brown (7.5YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Bg2=22 to 36 inches; dark grayish brown (10YR 4/2) silty clay; moderate medium and coarse subangular blocky structure; very firm; few fine roots; common distinct gray (10YR 5/1) coatings on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct brown (7.5YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Bg3=36 to 50 inches; grayish brown (10YR 5/2) silty clay; weak coarse prismatic structure parting to moderate coarse subangular blocky; very firm; common faint grayish brown (10YR 5/2) coatings on faces of peds; many medium distinct brown (7.5YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

BC=50 to 59 inches; yellowish brown (10YR 5/4) silty clay; weak coarse prismatic structure parting to moderate coarse subangular blocky; very firm; few distinct gray (10YR 5/1) coatings on vertical faces of peds; common medium and coarse distinct gray (10YR 6/1) iron depletions in the matrix; common medium faint brown (7.5YR 5/4) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear wavy boundary.

C=59 to 80 inches; yellowish brown (10YR 5/4) silty clay; massive, with widely spaced vertical fractures; very firm; few distinct gray (10YR 5/1) coatings on faces of fractures; common medium and coarse distinct gray (10YR 6/1) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the dark colored epipedon: 7 to 9 inches
Thickness of the solum: 30 to 60 inches
Depth to carbonates: 30 to 50 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, or is neutral, value of 2 or 3, chroma of 0 to 2
Texture=silty clay loam

Bg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 4 to 6, chroma of 0 to 2
Texture=silty clay or clay
C or Cg horizon:
Color=hue of 10YR, 2.5Y, or 5Y, or is neutral, value of 4 to 6, chroma of 0 to 4
Texture=silty clay, clay, or silty clay loam

Tuscola Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Stratified glaciolacustrine deposits
Landform: Rises, knolls, and flats on lake plains
Position on the landform: Backslopes, shoulders, summits
Slope: 0 to 6 percent

Adjacent soils: Colwood, Darroch, Patton, Shinrock

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Tuscola fine sandy loam, 2 to 6 percent slopes, about 3.5 miles northwest of Benton Ridge, in Blanchard Township, about 2050 feet west and 2400 feet south of the northeast corner of sec. 17, T. 1 N., R. 9 E.

Ap=0 to 11 inches; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

Bt1=11 to 16 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint brown (10YR 5/3) iron depletions in the matrix; neutral; clear wavy boundary.

Bt2=16 to 25 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct grayish brown (10YR 5/2) and few distinct brown (10YR 4/3) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint (10YR 4/4) and few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common distinct very dark grayish brown (10YR 3/2) masses of iron and manganese oxide accumulation on faces of peds; neutral; gradual wavy boundary.

Bt3=25 to 31 inches; yellowish brown (10YR 5/4) loam with strata of silt loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common distinct very dark grayish brown (10YR 3/2)

masses of iron and manganese oxide accumulation on faces of peds; neutral; clear wavy boundary.

BC=31 to 44 inches; yellowish brown (10YR 5/4) fine sandy loam with strata of silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; few distinct grayish brown (10YR 5/2) clay films on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; gradual wavy boundary.

C1=44 to 52 inches; yellowish brown (10YR 5/4) silt loam with strata of fine sand; massive; very friable; few fine roots; few distinct dark grayish brown (10YR 4/2) coatings in relict root channels; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; gradual wavy boundary.

C2=52 to 80 inches; brown (10YR 5/3) silt loam with strata of fine sand; massive; very friable; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 30 to 50 inches
Depth to carbonates: 30 to 50 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 1 to 3
Texture=fine sandy loam, loamy fine sand, or silt loam

Bt or Btg horizon:
Color=hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, chroma of 2 to 6
Texture=loam, clay loam, silty clay loam, silt loam, sandy clay loam, fine sandy loam, or sandy loam

C or Cg horizon:
Color=hue of 10YR or 7.5YR, value of 4 to 6, chroma of 1 to 6
Texture=silt loam, very fine sandy loam, fine sandy loam, fine sand, or very fine sand, and is commonly stratified. Some pedons have strata of clay, silty clay, or silty clay loam

Vanlue Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the loamy solum, and moderately slow in the lower part of the solum and the glaciolacustrine substratum, and slow or moderately slow in the substratum
Parent material: Stratified loamy and silty glaciolacustrine deposits overlying till
Landform: Rises on lake plains
Position on the landform: Summits, shoulders
Slope: 0 to 2 percent

Adjacent soils: Jenera, Rensselaer, Tiderishi

Taxonomic class: Fine-loamy, mixed, mesic Aquic Hapludalfs

Typical Pedon
Vanlue loam, 0 to 2 percent slopes, about 3.6 miles west of Benton Ridge, in Blanchard Township, about 520 feet north and 360 feet west of the southeast corner of sec. 30, T. 1 N., R. 9 E.

Ap=0 to 10 inches; dark brown (10YR 3/3) loam, very pale brown (10YR 7/3) dry; moderate fine and medium granular structure; friable; few fine roots; common fine and medium faint dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; clear smooth boundary.

Bt1=10 to 15 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 5/3) and grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) and few fine distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct dark brown (7.5YR 3/2) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt2=15 to 21 inches; brown (10YR 5/3) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) and common fine distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt3=21 to 28 inches; dark yellowish brown (10YR 4/4) clay loam with thin strata of loam and silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1)

moderately cemented iron and manganese oxide concretions in the matrix; neutral; gradual wavy boundary.

Bt4=28 to 35 inches; dark yellowish brown (10YR 4/4) clay loam with thin strata of sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/4) and few fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

2Bt5=35 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct very dark gray (10YR 3/1) moderately cemented iron and manganese oxide concretions in the matrix; slightly alkaline; clear wavy boundary.

2BC=40 to 44 inches; yellowish brown (10YR 5/4) silty clay loam with thin discontinuous strata of loam; weak medium subangular blocky structure; firm; few fine roots on vertical faces of peds; common distinct gray (10YR 5/1) coatings on vertical faces of peds; common medium distinct gray (10YR 5/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation on faces of peds; many faint very pale brown (10YR 7/3) moderately cemented calcium carbonate concretions in the matrix; strongly effervescent; slightly alkaline; clear wavy boundary.

2C1=44 to 59 inches; olive brown (2.5Y 4/4) silt loam; massive, with weak medium plates; firm; thin lenses of fine sand on faces of plates; common medium prominent gray (10YR 5/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

3C2=59 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive; firm; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 65 inches
Depth to carbonates: 25 to 50 inches
Depth to till: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR, value of 3 or 4, chroma of 2 or 3
Texture=loam
Content of rock fragments=0 to 3 percent

Bt or Btg horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 2 to 4
Texture=loam, clay loam, or sandy clay loam, and is commonly stratified
Content of rock fragments=0 to 7 percent

2Bt, 2Btg, 2BCg, or 2BC horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=silt loam or silty clay loam, and is commonly stratified
Content of rock fragments=less than 1 percent

2C or 2Cg horizon:
Color=hue of 10YR or 2.5Y, value of 4 or 5, chroma of 2 to 4
Texture=silt loam or silty clay loam, and is commonly stratified
Content of rock fragments=0 or 1 percent

3C horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, loam, silt loam, or silty clay loam
Content of rock fragments=1 to 7 percent

Vaughnsville Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum, slow or moderately slow in the lower part of the solum, and slow or very slow in the substratum
Parent material: Loamy glaciolacustrine deposits and the underlying till
Landform: Rises on beach ridges on lake plains
Position on the landform: Footslopes
Slope: 0 to 3 percent

Adjacent soils: Aurand, Fox, Haskins, Mermill, Oshtemo, Shawtown

Taxonomic class: Fine-loamy, mixed, mesic Oxyaquic Hapludalfs

Typical Pedon
Vaughnsville loam, 0 to 3 percent slopes, about 3 miles west of Van Buren, in Portage Township, about 1280 feet west and 1840 feet north of the southeast corner of sec. 16, T. 2 N., R. 10 E.

Ap=0 to 8 inches; dark reddish brown (2.5YR 3/4) loam, reddish brown (5YR 5/4) dry; weak coarse subangular blocky structure parting to moderate fine and medium granular; friable; common fine and few medium roots; common distinct reddish brown (5YR 4/3) organic coatings on faces of peds and in root channels; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt1=8 to 14 inches; yellowish red (5YR 4/6) clay loam; moderate fine and medium subangular blocky structure; friable; common fine and few medium roots; common distinct reddish brown (5YR 4/4) clay films on vertical faces of peds; common medium and coarse faint dark red (2.5YR 3/6) and few fine distinct brown (7.5YR 4/4) masses of iron accumulation in the matrix; 2 percent rock fragments; slightly acid; abrupt wavy boundary.

Bt2=14 to 20 inches; brown (7.5YR 4/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine and few medium roots; common prominent yellowish red (5YR 4/6) and common faint brown (7.5YR 4/4) clay films on faces of peds; common distinct yellowish red (5YR 4/6) linings in root and worm channels; common medium distinct yellowish red (5YR 4/6) masses of iron accumulation in the matrix; few fine faint brown (10YR 5/3) iron depletions in the matrix; few medium prominent very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation in the matrix; 2 percent rock fragments; neutral; clear wavy boundary.

Bt3=20 to 30 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; common fine and few medium roots; common faint brown (10YR 5/3) clay films on faces of peds; common prominent yellowish red (5YR 4/6) linings in root and worm channels; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few distinct very dark gray (10YR 3/1) masses of iron and manganese oxide accumulation on faces of peds; 2 percent rock fragments; neutral; clear smooth boundary.

BC1=30 to 36 inches; brown (10YR 5/3) sandy loam with thin strata of loamy sand; weak fine and medium subangular blocky structure; very friable; common fine and few medium roots; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 10 percent rock fragments; slightly alkaline; abrupt smooth boundary.

2BC2=36 to 45 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common distinct grayish brown (10YR 5/2) coatings and few distinct light gray (10YR 7/2) calcium carbonate coatings on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments; slightly effervescent; moderately alkaline; gradual wavy boundary.

2Cd=45 to 80 inches; brown (10YR 4/3) clay loam; massive, with widely spaced vertical fractures; very firm; common medium faint grayish brown (10YR 5/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation oriented along fractures; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the solum: 25 to 50 inches
Depth to carbonates: 25 to 45 inches
Depth to till: 20 to 40 inches
Depth to dense material: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 2.5YR, 5YR, or 10R, value of 3 or 4, chroma of 4 to 6
Texture=loam
Content of rock fragments=0 to 14 percent

Bt horizon:
Color=hue of 2.5YR, 5YR, or 7.5YR, value of 3 to 6, and chroma of 3 to 6 in the upper part, and 7.5YR or 10YR, value of 4 or 5, chroma of 3 to 6 in the lower part
Texture=clay loam, loam, or sandy clay loam in the upper part, and loam, sandy loam, or sandy clay loam, or the gravelly analogues of those textures in the lower part
Content of rock fragments=0 to 20 percent

2Bt or 2BC horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silty clay loam, clay, or silty clay
Content of rock fragments=1 to 7 percent

2Cd horizon:
Color=hue of 10YR, value of 4 or 5, chroma of 3 or 4
Texture=clay loam, silty clay loam, clay, or silty clay
Content of rock fragments=1 to 7 percent

Westland Series

Depth class: Very deep
Drainage class: Very poorly drained

Permeability: Moderate in the solum and very rapid in the underlying sandy and gravelly material
Parent material: Loamy deposits and the underlying sandy and gravelly outwash
Landform: Glacial drainage channels; drainageways and depressions on outwash plains
Slope: 0 to 1 percent

Adjacent soils: Fox, Oshtemo, Rensselaer

Taxonomic class: Fine-loamy, mixed, mesic Typic Argiaquolls

Typical Pedon
Westland loam, from an area of Westland-Rensselaer complex, 0 to 1 percent slopes, about 1.25 miles west of Mt. Cory, in Union Township, about 780 feet west and 1320 feet north of the southeast corner of sec. 20, T. 1 S., R. 9 E.

Ap=0 to 10 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common fine roots; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 3 percent rock fragments; neutral; clear smooth boundary.

BA=10 to 17 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; friable; common fine roots; common medium faint dark gray (10YR 4/1) iron depletions in the matrix; few fine and medium prominent strong brown (7.5YR 5/6) and common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 5 percent rock fragments; neutral; gradual wavy boundary.

Btg1=17 to 26 inches; dark gray (10YR 4/1) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium prominent strong brown (7.5YR 5/6) and common medium distinct (10YR 4/4) masses of iron accumulation in the matrix; 5 percent rock fragments; neutral; clear wavy boundary.

Btg2=26 to 36 inches; dark gray (10YR 4/1) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds and bridging between sand grains; many fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 10 percent rock fragments; neutral; clear wavy boundary.

Btg3=36 to 44 inches; dark grayish brown (10YR 4/2) loam with strata of sandy loam; weak medium subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds and bridging between sand grains; common medium faint dark gray (10YR 4/1) iron depletions in the matrix; common medium and coarse distinct dark yellowish brown (10YR 4/4) and common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 8 percent rock fragments; neutral; clear wavy boundary.

Btg4=44 to 52 inches; dark grayish brown (10YR 4/2) loam; weak medium and coarse subangular blocky structure; friable; few fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds and bridging between sand grains; few fine and medium prominent strong brown (7.5YR 5/6) and few medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; 10 percent rock fragments; neutral; gradual wavy boundary.

2BCg=52 to 59 inches; dark gray (10YR 4/1) gravelly sandy loam; weak medium subangular blocky structure; very friable; few faint dark gray (10YR 4/1) clay bridging sand grains; few fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 20 percent rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

2Cg=59 to 80 inches; dark gray (10YR 4/1) gravelly loamy coarse sand with strata of loamy coarse sand and fine sand; single grain; loose; few medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 20 percent rock fragments in the gravelly strata and 5 percent rock fragments in the loamy coarse sand strata; strongly effervescent; moderately alkaline.

Range in Characteristics
Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the solum: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Depth to bedrock: Greater than 80 inches

Ap horizon:
Color=hue of 10YR or 2.5Y, value of 2 or 3, chroma of 1 to 3
Texture=loam
Content of rock fragments=0 to 4 percent

Btg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture=loam, clay loam, or silty clay loam in the upper part and loam, clay loam, or sandy clay loam in the lower part
Content of rock fragments=0 to 5 percent in the upper part and 0 to 15 percent in the lower part

2BCg horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 6, chroma of 1 or 2
Texture=loam, clay loam, sandy loam, or sandy clay loam, or the gravelly analogues of those textures
Content of rock fragments=5 to 35 percent

2Cg or 2C horizon:
Color=hue of 10YR or 2.5Y, value of 4 to 7, chroma of 1 to 4
Texture=gravelly or very gravelly analogues of loamy coarse sand or coarse sand, and is commonly stratified
Content of rock fragments=15 to 50 percent

Formation of the Soils

This section describes the major factors of soil formation and relates them to the soils in Hancock County. Also, it describes some of the processes of soil formation.

Factors of Soil Formation

Soil is a three-dimensional natural body capable of supporting plant growth. The nature of the soil at a specific site is the result of the interaction of many factors and processes. There are five major factors of soil formation. These are parent material, climate, living organisms, relief, and time.

Parent Material

The material in which a soil formed is called parent material. Most of the parent material in Hancock County was deposited by the last glacier that covered the area, thousands of years ago, or by meltwater from this glacier. Other parent material includes older dolostone or limestone bedrock, more recent alluvium deposited by recent streams, and organic deposits from decaying plants.

Most of the till in the county was deposited directly beneath ice with little action by water. The till contains particles ranging in size from clay to large stones. Most pebbles are angular or subangular, indicating little water action. Although most of the material in the till is of local origin, some igneous stones were carried from parts of Canada. The till at the surface was deposited during the Wisconsinan glaciation.

The till plains in Hancock County are either ground moraines, end moraines, or disintegration moraines. Till plain deposits are massive and compact. They are silty clay loam or clay loam. Variations in the content of clay and sand appear to be related to readvances of the glacier into local glaciolacustrine deposits. Blount, Glynwood, Lybrand, Morley, Mortimer, and Pewamo soils formed in till.

Some of the till in the county was subject to modification by water action during various stages of lake formation during and after the Wisconsinan glaciation. Water-modified till primarily occupies the surficial deposits in the northern and west-central parts of the county. Water-modified till is the parent material of Hoytville and Nappanee soils.

Loamy and sandy sediments were deposited by water or wave action along old lake shorelines or as longshore bars. The loamy Arkport, Cygnet, Fox, Oshtemo, Rimer, and Shawtown soils formed in sandy and/or gravelly beach deposits and terraces along old shorelines.

Meltwater deposits were laid down by water from the melting glacier. Gravel and sand were deposited in rapidly moving, sloping streams. Alvada, Fox, Lamberjack, Thackery, and Westland soils formed in loamy material and in the underlying sandy and gravelly deposits on stream terraces and outwash areas. As the streams lost gradient or stream velocity, the finer sand and silt particles were deposited as deltas and bars and in local lake basins. Colwood, Darroch, Jenera, Patton, Rensselaer, Tiderishi, Tuscola, and Vanlue soils formed in sandy, loamy, and silty sediments. Where the streams flowed into local lakes, the finer particles settled out of the still water.

Clayey glaciolacustrine deposits are limited in Hancock County. They formed in a large basin known as Glacial Lake Maumee, which held meltwater from the retreating glacier, and from precipitation. Del Rey, Fulton, Lucas, Shinrock, and Toledo soils formed in clayey sediment in basins of former glacial lakes.

Dolostone or limestone are the parent materials of Biglick, Channahon, Joliet, Millsdale, Milton, and Randolph soils. This limestone has a very high calcium carbonate equivalent, but it is not violently effervescent because of the dolomitic nature of the limestone.

Alluvium is the parent material of the soils on flood plains. It consists of material that accumulates when fresh sediments are added by stream overflow. The deposits vary widely, depending on the stream gradient and the source of the sediment. Alluvial sediment is stratified because deposition occurs in three basic stages.

Gravel and stones are deposited on the streambed, sand is deposited as bars along the inner banks of meanders, and sand, silt, and clay are deposited during flooding. Flatrock, Harrod, Knoxdale, Medway, Rossburg, Shoals, and Sloan soils formed in alluvium.

The upper part of Adrian soils formed in decayed plant material that accumulated in marshes. The permanent wetness slowed decomposition and thus allowed the organic material to accumulate.

Climate

The climate in Hancock County is uniform enough that it has not greatly contributed to differences among the soils. It has favored physical change and chemical weathering of the parent material and the activity of living organisms.

The amount of precipitation varies as a result of microclimate. Runoff on steep slopes reduces the amount of effective precipitation, and drainage in depressions increases it. Rainfall has been adequate to leach from the upper part of the subsoil any carbonates that were in the parent material of some of the soils on uplands and terraces. Wetting and drying cycles have resulted in the translocation of clay minerals and the formation of soil structure.

The range in temperature has favored both physical change and chemical weathering of the parent material. Freezing and thawing aided the formation of soil structure. Warm temperatures in summer favored chemical reactions in the weathering of the primary minerals. Rainfall and temperatures have been conducive to plant growth and the accumulation of organic matter in all of the soils.

Living Organisms

The vegetation under which a soil forms influences soil properties, such as soil color, structure, reaction, and content and distribution of organic matter. The surface layer of soils that formed under trees is generally lighter in color than that of soils that formed under grass because grasses generally return more organic matter to the soil. Grasses also provide shelter for many burrowing animals, which alter the structure and thickness of soil horizons. Earthworms, burrowing insects, and small animals are constantly mixing the soil, making it more porous and adding organic residue. Bacteria, fungi, and other microorganisms contribute to the breakdown of organic residue. Generally, fungi are more active in acid soils and bacteria are more active in alkaline soils.

About four native plant communities made up the original vegetation of Hancock County. The dominant type is the beech forest community. Beech, sugar maple, red oak, white ash, white oak, and basswood are the common species (Gordon, 1966). This community is associated with Blount, Glynwood, Lybrand, and Morley soils. The elm-ash swamp forest consists of American elm, black ash, red maple, pin oak, swamp white oak, and hickory. This community is associated with Colwood, Hoytville, Mermill, Patton, Pewamo, and Rensselaer soils and other very poorly drained soils. The mixed oak forest consisted of many primary forest types but was mainly white oak, black oak, and northern red oak. This community is associated with the better drained soils of Limestone Ridge, specifically Biglick, Channahon, Glynwood, Milton, and Morley soils. The marsh and fen plant communities are associated with the very poorly drained Adrian and very poorly drained Gilford soils. These communities consist of a wide variety of water-tolerant species. Shrubs are common, but trees are rare (Gordon, 1966).

Human activities also affect soil formation. Examples of these activities are cultivation, seeding, artificial drainage, irrigation, and cutting and filling. Accelerated erosion caused by clearing and cultivating the more sloping soils, such as Glynwood, Lucas, Morley, Mortimer, Shinrock, and St. Clair soils, illustrates the impact of humans on soil formation. Loss of surface soil and compaction of the subsoil affect runoff and plant growth. Large areas of the Hoytville, Patton, and Pewamo soils have been systematically drained by ditches and subsurface drains. Draining reduces the content of organic matter and affects the processes of soil formation. Adding lime or fertilizer also affects the long-term development of the soil.

Relief

Relief, along with parent material, affects the natural drainage of soils. It influences the amount of runoff and the depth to the water table. Generally, the steeper soils have better

drainage than the nearly level soils. If the extent of drainage differs, different soils can form in the same parent material. For example, both Glynwood and Pewamo soils formed in till deposits. Glynwood soils are in high positions, and the water table generally is not as close to the surface. They are moderately well drained. Pewamo soils, however, are in low, level areas, and the water table is near or above the surface. Pewamo soils are very poorly drained.

A drainage sequence, or catena, is a group of soils that formed in the same parent material but differ in the extent of natural drainage. For example, the well drained Lybrand soils, the moderately well drained Glynwood and Morley soils, the somewhat poorly drained Blount soils, and the very poorly drained Pewamo soils make up a drainage sequence. All of these soils formed in silty clay loam and clay loam till.

Time

The length of time the parent material has been exposed to the soil-forming processes influences the nature of the soil that forms. The youngest soils in Hancock County, such as Flatrock, Knoxdale, and Rossburg soils, formed in recent stream deposits. Younger soils have horizons that are less well defined than those of the older soils.

The glacial deposits of Wisconsinan age in Hancock County are geologically young, but enough time has elapsed for the active forces of climate and plants and animals to produce the formation of distinct soil horizons. In most of the soils, carbonates have been leached, structure has developed in the subsoil, and organic matter has accumulated in the surface layer.

Processes of Soil Formation

Soil forms through complex, continuing processes. These processes are grouped into four general categories: additions, removals, transfers, and alterations.

The accumulation of organic matter in the formation of mineral soils is an example of an addition. The addition of organic residue has produced a dark surface layer. The upper part of the parent material originally was not darker than the lower part.

The loss of lime from the upper 2 to 4 feet of many of the soils in Hancock County is an example of the removal process. Although the parent material was limy (calcareous), water percolating through the soil has leached the lime from the upper part of the soil.

Water is the carrier for most of the transfers that have occurred in the soils of Hancock County. Clay has been transferred from the A and E horizons to the B horizon in many of the soils. The A and E horizons (especially the E horizon) have become a zone of eluviation, and the B horizon has become a zone of illuviation. Thin clay films are in pores and on ped surfaces in the B horizon of some soils. The presence or absence of clay films is an important criterion in soil classification.

The reduction and solution of ferrous iron is an example of an alteration process. This process has taken place in the very poorly drained soils and, to a lesser extent, in the somewhat poorly drained and moderately well drained soils. Reduction of iron, or gleying, is prominent in the very poorly drained Colwood, Hoytville, and Pewamo soils. This process is the result of a recurring water table. Gray soil indicates gleying. Reduced iron is soluble. The iron in the soils of Hancock County, however, commonly has remained in the horizon where it originated or has settled in an underlying horizon. Iron can be reoxidized and segregated in places to form yellowish brown redoximorphic concentrations that are brighter than the surrounding soil. The alteration of iron causes mottling in soils that are not well drained.

To a varying degree, all of the soils in Hancock County have been affected by each of the four soil-forming processes. The accumulation of organic matter has been prominent in the formation of Adrian soils. The removal of carbonates and the transfer of clay have been important in the formation of Glynwood and Shinrock soils.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

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.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Beach ridge. A low, essentially continuous mound of beach or beach and dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves and occurring singly or as one of a series of approximately parallel deposits. These ridges define the limits of relict lakes.

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.

Borrow pit. An open excavation from which soil and underlying material has been removed, usually for construction. Typically less than 2 acres in size. Larger areas are mapped as Udorthents.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

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.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A relatively sunken part of the earth’s surface, especially a low-lying area surrounded by higher ground, but without a well-defined natural outlet for surface drainage.

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 has 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.

COLE (coefficient of linear extensibility). See Linear extensibility.

Compaction. Any process by which the mineral grains of soil are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot. In agronomy, usually associated with machinery traffic across the soil during farming operations.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour. An imaginary line on the surface of the earth connecting points of the same elevation.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropland. Land used primarily for the production of adapted cultivated, close-growing, fruit, or nut crops for harvest, alone or in association with sod crops.

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.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense material. A very firm, massive, noncemented, root restrictive layer that has no cracks or the spacing of cracks that roots can enter is 10 centimeters or more. These materials within the survey area typically have a bulk density of more than 1.8 grams per cubic centimeter.

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.

Disintegration moraine. A drift topography characterized by chaotic mounds and pits, generally randomly oriented, developed in drift by collapse and flow as the underlying stagnant glacial ice melted. There will be used and unused stream courses and lake depressions interspersed with the morainic ridges. Consequently, there will be rapid or abrupt changes between materials of different lithology.

Dolostone. A term used for the sedimentary rock dolomite, in order to avoid confusion with the mineral of the same name. A carbonate sedimentary rock consisting of mostly (more than 50 percent by weight) of the mineral dolomite [CaMg(CO3)2].

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized=excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that, at some time move concentrated water and either lack a defined channel or have a small defined channel.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Effervescence. The gaseous response (observed as bubbles) of soil to applied hydrochloric acid (HCl) , hydrogen peroxide (H_2O_2), or other chemicals. A test to determine the presence of carbonates in the soil.

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.

End moraine. A moraine produced at the front of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued

supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

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.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Footslope. The geomorphic component that forms the inner gently inclined surface at the base of a hillslope. The surface profile is dominantly concave. In terms of gradational processes, the footslope is a transition zone between upslope sites of erosion (backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

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.

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.

Gravel pit. An open excavation from which soil and the loose underlying material have been removed, and used as a source of sand or gravel usually for construction purposes.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. Surface layer has more than 35 percent, by volume, of rock fragments which are mostly less than 3 inches in diameter in an area of surrounding soil that has less than 15 percent fragments.

Ground moraine. An extensive, fairly even layer of till that has an undulating surface; a deposit of rock debris dragged along, in, on, and beneath a glacier and emplaced by processes including lodgment and release from downwasting stagnant ice.

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.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

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.

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.

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.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

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.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain, relict. A nearly level surface marking the floor of an extinct lake filled in either by well sorted stratified sediments or by the reworking of existing sediments as a result of water action.

Lamella. An illuvial horizon less than 7.5 centimeters thick. Lamella contain an accumulation of oriented silicate clay on or bridging sand and silt grains (and rock fragments if present). A lamella has more silicate clay than the overlying eluvial horizon.

Landfill. An area where waste products of human habitation are disposed. These products can be above or below natural ground level.

Leaching. The removal of soluble material from soil or other material by percolating water.

Lime pit. An open excavation from which soil and underlying material has been removed and filled with alkaline material.

Limestone. A sedimentary rock composed of calcium carbonate. There are many impure varieties.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. 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. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithic contact. A boundary between soil and continuous, coherent, underlying material. The underlying material must be sufficiently coherent to make hand digging with a spade impractical.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Longshore bar. A narrow, elongate, coarse-textured ridge that once rose near to, or barely above, a pluvial or glacial lake and extended generally parallel to the shore but was separated from it by an intervening trough or lagoon; both the bar and lagoon are now relict features.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Marsh. A water saturated, very poorly drained area, intermittently or permanently water-covered. Marsh areas are dominantly vegetated by aquatic and grass-like plants.

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.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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.

Monadnock. An isolated hill of resistant rock rising conspicuously above the general level of a lower landform in a temperate climate representing an isolated remnant of a former erosion cycle in an area that has been largely beveled to its base level.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance=few, common, and many; size=fine, medium, and coarse; and contrast=faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Muck spot. An area in closed depressions with overwash and thin organic material underlain by lacustrine sediments.

Mulch. Any material, such as straw, sawdust, leaves, plastic film, or loose soil, that is spread upon the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, and evaporation.

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.)

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

No-till farming. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth, which typically involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used.

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.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Paralithic contact. Similar to a lithic contact except that it is softer and can be dug with difficulty with a spade.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pebbles. Rounded or partially rounded rock or mineral fragments between 2 and 75 mm in diameter.

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 movement of water through the soil.

Perennial water. A natural or manmade lake, pool, pit, or stream course that contains water for most of the year.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

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.

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.

Quarry. An open excavation from which bedrock has been removed.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rise. A geomorphic component of flat plains (e.g., lake plain, low coastal plain, low-gradient till plain) consisting of a slightly elevated but low, broad area with low slope gradients (e.g. 1-3 % slopes); typically a microfeature but can be fairly extensive. Commonly soils on a rise are better drained than those on the surrounding flat area.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. An exposure of bedrock at the surface of the earth.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground- water runoff or seepage flow from ground water.

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.

Sandy spot. An area of soil where the surface layer is sandy (usually loamy sand or sand) in an area where the surrounding soil or soils have a loamy or clayey surface layer.

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.

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.

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.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short steep slope. An elongate soil area that has slopes that are at least 2 slope classes steeper

than the slope class of the surrounding map unit. (NSSH, EX. 647-4)

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

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 components. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Level	0 to 1 percent
Nearly level	0 to 2 percent or 0 to 3 percent
Gently sloping	2 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 25 percent
Steep	25 to 50 percent

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.

Spoil area. Piles of earth materials, either smoothed or uneven, resulting from human activities.

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.

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.

Subsidence. The loss in volume that occurs in muck soils when they oxidize or dry.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

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."

Swamp. A water saturated, very poorly drained area, intermittently or permanently water-covered. Swamp areas are dominantly vegetated by trees and shrubs.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace (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."

Till plain. An extensive area of nearly level to undulating soils underlain by till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

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.

Typical pedon site. The location of the pedon described as typical for the series within the county.

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.

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.

Wet spot. An area of soil that is somewhat poorly drained to very poorly drained and that is at least 2 drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1961-90 at Findlay, Ohio)

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-----	30.7	15.9	23.3	58	-14	1	1.90	0.91	2.76	5	8.4
February----	34.2	18.4	26.3	61	-8	1	1.89	0.89	2.76	5	7.1
March-------	46.2	28.2	37.2	77	2	27	2.89	1.72	3.94	7	3.7
April-------	59.0	38.2	48.6	84	18	101	3.21	1.82	4.44	7	1.1
May---------	70.7	49.1	59.9	90	30	323	3.80	2.60	4.90	7	0.1
June--------	79.9	58.4	69.2	95	42	575	3.83	2.17	5.29	6	0.0
July--------	83.4	62.4	72.9	97	48	709	4.16	2.15	5.92	6	0.0
August------	81.0	60.0	70.5	94	44	636	3.85	1.87	5.56	6	0.0
September---	74.4	53.4	63.9	91	34	420	2.93	1.49	4.19	5	0.0
October-----	62.2	42.0	52.1	83	22	147	2.14	1.17	3.00	5	0.1
November----	48.3	32.7	40.5	73	14	28	2.87	1.48	4.08	7	1.6
December----	35.4	21.7	28.5	63	-6	4	2.82	1.78	3.75	6	6.6
Yearly:											
Average---	58.8	40.0	49.4	---	---	---	---	---	---	---	---
Extreme---	104	-20	---	98	-15	---	---	---	---	---	---
Total-----	---	---	---	---	---	2972	36.29	20.05	50.59	72	28.7

* 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 (50 degrees. F)

TABLE 2.--FREEZE DATES IN SPRING AND FALL
(Recorded in the period 1961-90 at Findlay, Ohio)

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 16	April 30	May 15
2 year in 10 later than--	April 12	April 25	May 10
5 year in 10 later than--	April 4	April 16	April 30
First freezing temperature in fall:			
1 yr in 10 earlier than--	October 17	October 9	September 25
2 yr in 10 earlier than--	October 23	October 15	October 1
5 yr in 10 earlier than--	November 3	October 25	October 12

TABLE 3.--GROWING SEASON
(Recorded in the period 1961-90 at Findlay, Ohio)

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	194	170	138
8 years in 10	200	178	147
5 years in 10	212	192	165
2 years in 10	224	206	182
1 year in 10	231	213	191

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE MAP UNITS

Map symbol	Soil name	Acres	Percent
AdA	Adrian muck, 0 to 1 percent slopes	957	0.3
AkA	Alvada loam, 0 to 1 percent slopes	2,964	0.9
AmA	Alvada-Urban land complex, 0 to 2 percent slopes	613	0.2
AnA	Aquents, clayey, 0 to 1 percent slopes	513	0.2
ApB	Arkport loamy fine sand, 2 to 6 percent slopes	210	*
ArA	Aurand loam, 0 to 2 percent slopes	3,721	1.1
AsA	Aurand-Urban land complex, 0 to 2 percent slopes	443	0.1
BgA	Biglick-Milton complex, 0 to 2 percent slopes	125	*
BgB	Biglick-Milton complex, 2 to 6 percent slopes	191	*
BnA	Blount loam, 0 to 2 percent slopes	3,305	1.0
BoA	Blount silt loam, 0 to 2 percent slopes	71,211	20.8
BoB	Blount silt loam, 2 to 4 percent slopes	24,566	7.2
BpA	Blount-Houcktown complex, 0 to 3 percent slopes	12,141	3.6
BrA	Blount-Jenera complex, 0 to 3 percent slopes	1,606	0.5
BuA	Blount-Urban land complex, 0 to 2 percent slopes	997	0.3
ChC	Channahon-Biglick complex, 6 to 12 percent slopes	62	*
CoA	Colwood loam, 0 to 1 percent slopes	308	*
CtA	Cygnet loam, 0 to 2 percent slopes	522	0.2
CuA	Cygnet-Urban land complex, 0 to 2 percent slopes	71	*
DbA	Darroch loam, 0 to 2 percent slopes	461	0.1
DeA	Del Rey silt loam, 0 to 2 percent slopes	179	*
DfA	Del Rey-Blount complex, 0 to 3 percent slopes	6,252	1.8
DuB	Dunbridge loamy fine sand, 1 to 4 percent slopes	139	*
EmA	Elliott silt loam, 0 to 2 percent slopes	869	0.3
FbA	Flatrock loam, 0 to 2 percent slopes, occasionally flooded	135	*
FcA	Flatrock silt loam, 0 to 2 percent slopes, occasionally flooded	508	0.1
FdA	Flatrock silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded	1,465	0.4
FoA	Fox loam, 0 to 2 percent slopes	227	*
FoB	Fox loam, 2 to 6 percent slopes	1,411	0.4
FoC2	Fox loam, 6 to 12 percent slopes, eroded	60	*
FsA	Fulton silt loam, 0 to 2 percent slopes	163	*
FtA	Fulton silt loam, till substratum, 0 to 2 percent slopes	123	*
GaB	Gallman loam, 2 to 6 percent slopes	164	*
GfA	Gilford mucky loam, 0 to 1 percent slopes	486	0.1
GmA	Glynwood loam, limestone substratum, 0 to 2 percent slopes	136	*
GnB	Glynwood silt loam, 2 to 6 percent slopes	9,634	2.8
GpB2	Glynwood silty clay loam, 2 to 6 percent slopes, eroded	1,090	0.3
GpC2	Glynwood silty clay loam, 6 to 12 percent slopes, eroded	1,210	0.4
GsB	Glynwood-Blount-Houcktown complex, 1 to 4 percent slopes	15,700	4.6
GuB	Glynwood-Urban land complex, 2 to 6 percent slopes	958	0.3
HaA	Harrod silt loam, 0 to 1 percent slopes, frequently flooded	484	0.1
HkA	Haskins fine sandy loam, 0 to 2 percent slopes	83	*
HnA	Haskins loam, 0 to 2 percent slopes	1,310	0.4
HpA	Houcktown loam, 0 to 2 percent slopes	301	*
HpB	Houcktown loam, 2 to 6 percent slopes	2,995	0.9
HrB	Houcktown-Glynwood-Jenera complex, 1 to 4 percent slopes	1,941	0.6
HsA	Hoytville silty clay loam, 0 to 1 percent slopes	1,885	0.6
HtA	Hoytville silty clay, 0 to 1 percent slopes	23,347	6.8
JeA	Jenera fine sandy loam, 0 to 2 percent slopes	1,182	0.3
JeB	Jenera fine sandy loam, 2 to 6 percent slopes	634	0.2
JfB	Jenera-Shinrock, till substratum complex, 1 to 4 percent slopes	2,042	0.6
JoA	Joliet loam, 0 to 1 percent slopes	175	*
KnA	Knoxdale silt loam, 0 to 2 percent slopes, occasionally flooded	224	*
LbA	Lamberjack loam, 0 to 2 percent slopes	1,142	0.3
LcA	Lamberjack-Urban land complex, 0 to 2 percent slopes	1,850	0.5
LuB2	Lucas silty clay loam, 2 to 6 percent slopes, eroded	47	*
LyE	Lybrand silt loam, 18 to 50 percent slopes	288	*
MbA	Medway silt loam, 0 to 2 percent slopes, occasionally flooded	726	0.2
McA	Medway silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded	1,417	0.4
MeA	Mermill loam, 0 to 1 percent slopes	1,507	0.4
MfA	Mermill clay loam, 0 to 1 percent slopes	895	0.3

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE MAP UNITS--Continued

Map symbol	Soil name	Acres	Percent
MgA	Millsdale silty clay loam, 0 to 1 percent slopes	2,553	0.7
MnA	Milton silt loam, 0 to 2 percent slopes	652	0.2
MpD3	Morley clay loam, 12 to 18 percent slopes, severely eroded	242	*
MrA	Morley loam, limestone substratum, 0 to 2 percent slopes	450	0.1
MsB	Morley, limestone substratum-Milton complex, 2 to 6 percent slopes	607	0.2
MvB	Mortimer silt loam, 2 to 6 percent slopes	1,459	0.4
MwB2	Mortimer silty clay loam, 2 to 6 percent slopes, eroded	79	*
NnA	Nappanee loam, 0 to 2 percent slopes	943	0.3
NnB	Nappanee loam, 2 to 6 percent slopes	44	*
NpA	Nappanee silty clay loam, 0 to 2 percent slopes	2,333	0.7
NpB2	Nappanee silty clay loam, 2 to 6 percent slopes, eroded	241	*
NrA	Nappanee-Urban land complex, 0 to 2 percent slopes	81	*
OrA	Oshtemo fine sandy loam, 0 to 2 percent slopes	495	0.1
OrB	Oshtemo fine sandy loam, 2 to 6 percent slopes	566	0.2
OrC	Oshtemo fine sandy loam, 6 to 12 percent slopes	52	*
OsB	Oshtemo sandy loam, till substratum, 2 to 6 percent slopes	818	0.2
OwB	Ottokee loamy fine sand, 0 to 6 percent slopes	199	*
PbA	Patton silty clay loam, 0 to 1 percent slopes	364	0.1
PmA	Pewamo silty clay loam, 0 to 1 percent slopes	83,197	24.4
PnA	Pewamo-Urban land complex, 0 to 2 percent slopes	743	0.2
Pt	Pits, quarry	286	*
RcA	Randolph silt loam, 0 to 2 percent slopes	1,086	0.3
RgB	Rawson sandy loam, 2 to 6 percent slopes	117	*
RhA	Rensselaer loam, till substratum, 0 to 1 percent slopes	5,090	1.5
RnA	Rimer loamy sand, 0 to 2 percent slopes	99	*
RoA	Rimer loamy fine sand, deep phase, 0 to 2 percent slopes	216	*
RtA	Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded	917	0.3
SeA	Shawtown loam, 0 to 2 percent slopes	778	0.2
SeB	Shawtown loam, 2 to 6 percent slopes	2,072	0.6
SfB	Shinrock silt loam, 2 to 6 percent slopes	129	*
SgC2	Shinrock silty clay loam, 6 to 12 percent slopes, eroded	107	*
SkB	Shinrock, till substratum-Glynwood complex, 1 to 4 percent slopes	2,918	0.9
SmA	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded	857	0.3
SnA	Sloan loam, 0 to 1 percent slopes, occasionally flooded	705	0.2
SoA	Sloan silty clay loam, 0 to 1 percent slopes, occasionally flooded	2,924	0.9
SpA	Sloan silty clay loam, limestone substratum, 0 to 1 percent slopes, occasionally flooded	2,926	0.9
StB2	St. Clair silty clay loam, 2 to 6 percent slopes, eroded	400	0.1
StC2	St. Clair silty clay loam, 6 to 12 percent slopes, eroded	379	0.1
ThA	Thackery loam, till substratum, 0 to 2 percent slopes	1,172	0.3
TkA	Tiderishi loam, 0 to 2 percent slopes	2,303	0.7
TnA	Toledo silty clay loam, 0 to 1 percent slopes	74	*
ToB	Tuscola loamy fine sand, 2 to 6 percent slopes	306	*
TpA	Tuscola fine sandy loam, 0 to 2 percent slopes	637	0.2
TpB	Tuscola fine sandy loam, 2 to 6 percent slopes	303	*
TuB	Tuscola silt loam, 2 to 6 percent slopes	154	*
UcA	Udorthents, loamy, 0 to 2 percent slopes	984	0.3
UcD	Udorthents, loamy, 2 to 25 percent slopes	453	0.1
Ur	Urban land	786	0.2
VaA	Vanlue loam, 0 to 2 percent slopes	1,682	0.5
VeA	Vaughnsville loam, 0 to 3 percent slopes	197	*
W	Water	2,088	0.6
WeA	Westland-Rensselaer complex, 0 to 1 percent slopes	1,927	0.6
	Total	341,561	100.0

* Less than 0.1 percent.

TABLE 5.--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
AkA	Alvada loam, 0 to 1 percent slopes (Prime farmland if drained)
ApB	Arkport loamy fine sand, 2 to 6 percent slopes
ArA	Aurand loam, 0 to 2 percent slopes (Prime farmland if drained)
BnA	Blount loam, 0 to 2 percent slopes (Prime farmland if drained)
BoA	Blount silt loam, 0 to 2 percent slopes (Prime farmland if drained)
BoB	Blount silt loam, 2 to 4 percent slopes (Prime farmland if drained)
BpA	Blount-Houcktown complex, 0 to 3 percent slopes (Prime farmland if drained)
BrA	Blount-Jenera complex, 0 to 3 percent slopes (Prime farmland if drained)
CoA	Colwood loam, 0 to 1 percent slopes (Prime farmland if drained)
CtA	Cygnet loam, 0 to 2 percent slopes
DbA	Darroch loam, 0 to 2 percent slopes (Prime farmland if drained)
DeA	Del Rey silt loam, 0 to 2 percent slopes (Prime farmland if drained)
DfA	Del Rey-Blount complex, 0 to 3 percent slopes (Prime farmland if drained)
DuB	Dunbridge loamy fine sand, 1 to 4 percent slopes
EmA	Elliott silt loam, 0 to 2 percent slopes (Prime farmland if drained)
FbA	Flatrock loam, 0 to 2 percent slopes, occasionally flooded
FcA	Flatrock silt loam, 0 to 2 percent slopes, occasionally flooded
FdA	Flatrock silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded
FoA	Fox loam, 0 to 2 percent slopes
FoB	Fox loam, 2 to 6 percent slopes
FsA	Fulton silt loam, 0 to 2 percent slopes (Prime farmland if drained)
FtA	Fulton silt loam, till substratum, 0 to 2 percent slopes (Prime farmland if drained)
GaB	Gallman loam, 2 to 6 percent slopes
GfA	Gilford mucky loam, 0 to 1 percent slopes (Prime farmland if drained)
GmA	Glynwood loam, limestone substratum, 0 to 2 percent slopes
GnB	Glynwood silt loam, 2 to 6 percent slopes
GpB2	Glynwood silty clay loam, 2 to 6 percent slopes, eroded
GsB	Glynwood-Blount-Houcktown complex, 1 to 4 percent slopes
HaA	Harrod silt loam, 0 to 1 percent slopes, frequently flooded (Prime farmland if protected from flooding or not frequently flooded during the growing season)
HkA	Haskins fine sandy loam, 0 to 2 percent slopes (Prime farmland if drained)
HnA	Haskins loam, 0 to 2 percent slopes (Prime farmland if drained)
HpA	Houcktown loam, 0 to 2 percent slopes
HpB	Houcktown loam, 2 to 6 percent slopes
HrB	Houcktown-Glynwood-Jenera complex, 1 to 4 percent slopes
HsA	Hoytville silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
HtA	Hoytville silty clay, 0 to 1 percent slopes (Prime farmland if drained)
JeA	Jenera fine sandy loam, 0 to 2 percent slopes
JeB	Jenera fine sandy loam, 2 to 6 percent slopes
JfB	Jenera-Shinrock, till substratum complex, 1 to 4 percent slopes
KnA	Knoxdale silt loam, 0 to 2 percent slopes, occasionally flooded
LbA	Lamberjack loam, 0 to 2 percent slopes (Prime farmland if drained)
LuB2	Lucas silty clay loam, 2 to 6 percent slopes, eroded
MbA	Medway silt loam, 0 to 2 percent slopes, occasionally flooded
McA	Medway silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded
MeA	Mermill loam, 0 to 1 percent slopes (Prime farmland if drained)
MfA	Mermill clay loam, 0 to 1 percent slopes (Prime farmland if drained)
MgA	Millsdale silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
MnA	Milton silt loam, 0 to 2 percent slopes
MrA	Morley loam, limestone substratum, 0 to 2 percent slopes
MsB	Morley, limestone substratum-Milton complex, 2 to 6 percent slopes
MvB	Mortimer silt loam, 2 to 6 percent slopes
MwB2	Mortimer silty clay loam, 2 to 6 percent slopes, eroded
NnA	Nappanee loam, 0 to 2 percent slopes (Prime farmland if drained)
NnB	Nappanee loam, 2 to 6 percent slopes (Prime farmland if drained)
NpA	Nappanee silty clay loam, 0 to 2 percent slopes (Prime farmland if drained)
NpB2	Nappanee silty clay loam, 2 to 6 percent slopes, eroded (Prime farmland if drained)
OrA	Oshtemo fine sandy loam, 0 to 2 percent slopes
OrB	Oshtemo fine sandy loam, 2 to 6 percent slopes
OsB	Oshtemo sandy loam, till substratum, 2 to 6 percent slopes

TABLE 5.--PRIME FARMLAND--Continued

Map symbol	Soil name
PbA	Patton silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
PmA	Pewamo silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
RcA	Randolph silt loam, 0 to 2 percent slopes (Prime farmland if drained)
RgB	Rawson sandy loam, 2 to 6 percent slopes
RhA	Rensselaer loam, till substratum, 0 to 1 percent slopes (Prime farmland if drained)
RoA	Rimer loamy fine sand, deep phase, 0 to 2 percent slopes (Prime farmland if drained)
RtA	Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded
SeA	Shawtown loam, 0 to 2 percent slopes
SeB	Shawtown loam, 2 to 6 percent slopes
SfB	Shinrock silt loam, 2 to 6 percent slopes
SkB	Shinrock, till substratum-Glynwood complex, 1 to 4 percent slopes
SmA	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded (Prime farmland if drained)
SnA	Sloan loam, 0 to 1 percent slopes, occasionally flooded (Prime farmland if drained)
SoA	Sloan silty clay loam, 0 to 1 percent slopes, occasionally flooded (Prime farmland if drained)
SpA	Sloan silty clay loam, limestone substratum, 0 to 1 percent slopes, occasionally flooded (Prime farmland if drained)
StB2	St. Clair silty clay loam, 2 to 6 percent slopes, eroded
ThA	Thackery loam, till substratum, 0 to 2 percent slopes
TkA	Tiderishi loam, 0 to 2 percent slopes (Prime farmland if drained)
TnA	Toledo silty clay loam, 0 to 1 percent slopes (Prime farmland if drained)
ToB	Tuscola loamy fine sand, 2 to 6 percent slopes
TpA	Tuscola fine sandy loam, 0 to 2 percent slopes
TpB	Tuscola fine sandy loam, 2 to 6 percent slopes
TuB	Tuscola silt loam, 2 to 6 percent slopes
VaA	Vanlue loam, 0 to 2 percent slopes (Prime farmland if drained)
VeA	Vaughnsville loam, 0 to 3 percent slopes
WeA	Westland-Rensselaer complex, 0 to 1 percent slopes (Prime farmland if drained)

TABLE 6.--HYDRIC SOILS

Map symbol	Soil name
AdA	Adrian muck, 0 to 1 percent slopes
AkA	Alvada loam, 0 to 1 percent slopes
AmA	Alvada-Urban land complex, 0 to 2 percent slopes
AnA	Aquents, clayey, 0 to 1 percent slopes
CoA	Colwood loam, 0 to 1 percent slopes
GfA	Gilford mucky loam, 0 to 1 percent slopes
HsA	Hoytville silty clay loam, 0 to 1 percent slopes
HtA	Hoytville silty clay, 0 to 1 percent slopes
JoA	Joliet loam, 0 to 1 percent slopes
MeA	Mermill loam, 0 to 1 percent slopes
MfA	Mermill clay loam, 0 to 1 percent slopes
MgA	Millsdale silty clay loam, 0 to 1 percent slopes
PbA	Patton silty clay loam, 0 to 1 percent slopes
PmA	Pewamo silty clay loam, 0 to 1 percent slopes
PnA	Pewamo-Urban land complex, 0 to 2 percent slopes
RhA	Rensselaer loam, till substratum, 0 to 1 percent slopes
SnA	Sloan loam, 0 to 1 percent slopes, occasionally flooded
SoA	Sloan silty clay loam, 0 to 1 percent slopes, occasionally flooded
SpA	Sloan silty clay loam, limestone substratum, 0 to 1 percent slopes, occasionally flooded
TnA	Toledo silty clay loam, 0 to 1 percent slopes
WeA	Westland-Rensselaer complex, 0 to 1 percent slopes

TABLE 7.--NONHYDRIC MAP UNITS WITH HYDRIC COMPONENTS

Map symbol	Soil name
ArA	Aurand loam, 0 to 2 percent slopes
AsA	Aurand-Urban land complex, 0 to 2 percent slopes
BnA	Blount loam, 0 to 2 percent slopes
BoA	Blount silt loam, 0 to 2 percent slopes
BoB	Blount silt loam, 2 to 4 percent slopes
BpA	Blount-Houcktown complex, 0 to 3 percent slopes
BrA	Blount-Jenera complex, 0 to 3 percent slopes
BuA	Blount-Urban land complex, 0 to 2 percent slopes
CtA	Cygnet loam, 0 to 2 percent slopes
CuA	Cygnet-Urban land complex, 0 to 2 percent slopes
DbA	Darroch loam, 0 to 2 percent slopes
DeA	Del Rey silt loam, 0 to 2 percent slopes
DfA	Del Rey-Blount complex, 0 to 3 percent slopes
EmA	Elliott silt loam, 0 to 2 percent slopes
FbA	Flatrock loam, 0 to 2 percent slopes, occasionally flooded
FcA	Flatrock silt loam, 0 to 2 percent slopes, occasionally flooded
FdA	Flatrock silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded
FsA	Fulton silt loam, 0 to 2 percent slopes
FtA	Fulton silt loam, till substratum, 0 to 2 percent slopes
GnB	Glynwood silt loam, 2 to 6 percent slopes
GpB2	Glynwood silty clay loam, 2 to 6 percent slopes, eroded
GpC2	Glynwood silty clay loam, 6 to 12 percent slopes, eroded
GsB	Glynwood-Blount-Houcktown complex, 1 to 4 percent slopes
GuB	Glynwood-Urban land complex, 2 to 6 percent slopes
HaA	Harrod silt loam, 0 to 1 percent slopes, frequently flooded
HkA	Haskins fine sandy loam, 0 to 2 percent slopes
HnA	Haskins loam, 0 to 2 percent slopes
HpA	Houcktown loam, 0 to 2 percent slopes
HpB	Houcktown loam, 2 to 6 percent slopes
HrB	Houcktown-Glynwood-Jenera complex, 1 to 4 percent slopes
JeA	Jenera fine sandy loam, 0 to 2 percent slopes
JeB	Jenera fine sandy loam, 2 to 6 percent slopes
JfB	Jenera-Shinrock, till substratum complex, 1 to 4 percent slopes
KnA	Knoxdale silt loam, 0 to 2 percent slopes, occasionally flooded
LbA	Lamberjack loam, 0 to 2 percent slopes
LcA	Lamberjack-Urban land complex, 0 to 2 percent slopes
LuB2	Lucas silty clay loam, 2 to 6 percent slopes, eroded
MbA	Medway silt loam, 0 to 2 percent slopes, occasionally flooded
McA	Medway silt loam, limestone substratum, 0 to 2 percent slopes, occasionally flooded
MpD3	Morley clay loam, 12 to 18 percent slopes, severely eroded
MvB	Mortimer silt loam, 2 to 6 percent slopes
NnA	Nappanee loam, 0 to 2 percent slopes
NnB	Nappanee loam, 2 to 6 percent slopes
NpA	Nappanee silty clay loam, 0 to 2 percent slopes
NpB2	Nappanee silty clay loam, 2 to 6 percent slopes, eroded
NrA	Nappanee-Urban land complex, 0 to 2 percent slopes
OwB	Ottokee loamy fine sand, 0 to 6 percent slopes
RcA	Randolph silt loam, 0 to 2 percent slopes
RgB	Rawson sandy loam, 2 to 6 percent slopes
RnA	Rimer loamy sand, 0 to 2 percent slopes
RoA	Rimer loamy fine sand, deep phase, 0 to 2 percent slopes
RtA	Rossburg silt loam, 0 to 2 percent slopes, occasionally flooded
SeA	Shawtown loam, 0 to 2 percent slopes
SfB	Shinrock silt loam, 2 to 6 percent slopes
SgC2	Shinrock silty clay loam, 6 to 12 percent slopes, eroded
SkB	Shinrock, till substratum-Glynwood complex, 1 to 4 percent slopes
SmA	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded
StB2	St. Clair silty clay loam, 2 to 6 percent slopes, eroded
ThA	Thackery loam, till substratum, 0 to 2 percent slopes
TkA	Tiderishi loam, 0 to 2 percent slopes
ToB	Tuscola loamy fine sand, 2 to 6 percent slopes
TpA	Tuscola fine sandy loam, 0 to 2 percent slopes
TpB	Tuscola fine sandy loam, 2 to 6 percent slopes
TuB	Tuscola silt loam, 2 to 6 percent slopes
VaA	Vanlue loam, 0 to 2 percent slopes

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS

(See text for a description of the limitations and hazards listed in this table. Only soils suitable for cultivated crops are listed in this table.)

Soil name and map symbol	Cropland limitations and hazards
AdA:	
Adrian	Ponding, high potential for ground-water pollution, frost action, subsidence of the muck, wind erosion, sandy layers
AkA:	
Alvada	Ponding, frost action
ApB:	
Arkport	Erosion hazard, wind erosion, limited available water capacity, sandy layers
ArA:	
Aurand	Seasonal high water table, frost action
BgA:	
Biglick	Depth to bedrock, high potential for ground-water pollution, limited available water capacity, high clay content
Milton	Depth to bedrock, high potential for ground-water pollution, limited available water capacity, high clay content
BgB:	
Biglick	Depth to bedrock, high potential for ground-water pollution, erosion hazard, limited available water capacity, high clay content
Milton	Depth to bedrock, high potential for ground-water pollution, erosion hazard, limited available water capacity, high clay content
BnA:	
Blount	Seasonal high water table, frost action, high clay content
BoA:	
Blount	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
BoB:	
Blount	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
BpA:	
Blount	Seasonal high water table, frost action, high clay content
Houcktown	Seasonal high water table, frost action
BrA:	
Blount	Seasonal high water table, frost action, high clay content
Jenera	Seasonal high water table, frost action, wind erosion
ChC:	
Channahon	Depth to bedrock, high potential for ground-water pollution, easily eroded, erosion hazard, limited available water capacity
Biglick	Depth to bedrock, high potential for ground-water pollution, easily eroded, erosion hazard, limited available water capacity, high clay content
CoA:	
Colwood	Ponding, moderate potential for ground-water pollution, frost action
CtA:	
Cygnet	Seasonal high water table, frost action
DbA:	
Darroch	Seasonal high water table, moderate potential for ground-water pollution, frost action
DeA:	
Del Rey	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
DfA:	
Del Rey	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
Blount	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
DuB:	
Dunbridge	Depth to bedrock, high potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS--Continued

Soil name and map symbol	Cropland limitations and hazards
EmA:	
Elliott	Seasonal high water table, surface compaction, frost action, high clay content
FbA:	
Flatrock	Occasional flooding, seasonal high water table, moderate potential for ground-water pollution, frost action
FcA:	
Flatrock	Occasional flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action, surface crusting
FdA:	
Flatrock, limestone substratum	Occasional flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action, surface crusting
FoA:	
Fox	High potential for ground-water pollution, limited available water capacity
FoB:	
Fox	High potential for ground-water pollution, erosion hazard
FoC2:	
Fox	Part of the surface layer removed by erosion, high potential for ground-water pollution, fair tilth, easily eroded, erosion hazard, limited available water capacity
FsA:	
Fulton	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
FtA:	
Fulton, till substratum	Seasonal high water table, surface compaction, frost action, surface crusting, high clay content
GaB:	
Gallman	Erosion hazard
GfA:	
Gilford	Ponding, high potential for ground-water pollution, frost action, wind erosion
GmA:	
Glynwood, limestone substratum	Seasonal high water table, frost action, high clay content
GnB:	
Glynwood	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
GpB2:	
Glynwood	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, erosion hazard, clodding, high clay content
GpC2:	
Glynwood	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, easily eroded, erosion hazard, clodding, high clay content
GsB:	
Glynwood	Seasonal high water table, surface compaction, frost action, fair tilth, erosion hazard, clodding, high clay content
Blount	Seasonal high water table, frost action, high clay content
Houcktown	Seasonal high water table, frost action, erosion hazard
HaA:	
Harrod	Frequent flooding, seasonal high water table, surface compaction, depth to bedrock, high potential for ground-water pollution, frost action
HkA:	
Haskins	Seasonal high water table, frost action, wind erosion, restricted permeability
HnA:	
Haskins	Seasonal high water table, frost action, restricted permeability

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS--Continued

Soil name and map symbol	Cropland limitations and hazards
HpA:	
Houcktown	Seasonal high water table, frost action
HpB:	
Houcktown	Seasonal high water table, frost action, erosion hazard
HrB:	
Houcktown	Seasonal high water table, frost action, erosion hazard, limited available water capacity
Glynwood	Seasonal high water table, surface compaction, frost action, fair tilth, erosion hazard, clodding, high clay content
Jenera	Seasonal high water table, frost action, erosion hazard, wind erosion
HsA:	
Hoytville	Ponding, surface compaction, frost action, fair tilth, clodding, high clay content
HtA:	
Hoytville	Ponding, surface compaction, poor tilth, frost action, clodding, high clay content
JeA:	
Jenera	Seasonal high water table, frost action, wind erosion
JeB:	
Jenera	Seasonal high water table, frost action, erosion hazard, wind erosion
JfB:	
Jenera	Seasonal high water table, frost action, erosion hazard, wind erosion,
Shinrock, till substratum	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
JoA:	
Joliet	Seasonal high water table, depth to bedrock, high potential for ground-water pollution, frost action, limited available water capacity
KnA:	
Knoxdale	Occasional flooding, surface compaction, surface crusting
LbA:	
Lamberjack	Seasonal high water table, frost action
LuB2:	
Lucas	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, erosion hazard, clodding, high clay content
MbA:	
Medway	Occasional flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action
McA:	
Medway, limestone substratum	Occasional flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action
MeA:	
Mermill	Ponding, frost action, restricted permeability
MfA:	
Mermill	Ponding, surface compaction, frost action, fair tilth, restricted permeability
MgA:	
Millsdale	Ponding, surface compaction, depth to bedrock, high potential for ground-water pollution, frost action, fair tilth, limited available water capacity, high clay content
MnA:	
Milton	Surface compaction, depth to bedrock, high potential for ground-water pollution, surface crusting, limited available water capacity, high clay content
MpD3:	
Morley	Most of the surface layer removed by erosion, surface compaction, fair tilth, easily eroded, erosion hazard, limited available water capacity, clodding, root restrictive layer, high clay content
MrA:	
Morley, limestone substratum	No limitations or hazards

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS--Continued

Soil name and map symbol	Cropland limitations and hazards
MsB:	
Morley, limestone substratum	Erosion hazard
Milton	Surface compaction, depth to bedrock, high potential for ground-water pollution, surface crusting, erosion hazard, limited available water capacity, high clay content
MvB:	
Mortimer	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
MwB2:	
Mortimer	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, erosion hazard, clodding, high clay content
NnA:	
Nappanee	Seasonal high water table, frost action, high clay content
NnB:	
Nappanee	Seasonal high water table, frost action, erosion hazard, limited available water capacity, high clay content
NpA:	
Nappanee	Seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, clodding, high clay content
NpB2:	
Nappanee	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, erosion hazard, limited available water capacity, clodding, high clay content
OrA:	
Oshtemo	High potential for ground-water pollution, wind erosion
OrB:	
Oshtemo	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity
OrC:	
Oshtemo	High potential for ground-water pollution, easily eroded, erosion hazard, wind erosion
OsB:	
Oshtemo, till substratum	Erosion hazard, wind erosion
OwB:	
Ottokee	High potential for ground-water pollution, erosion hazard, wind erosion, limited available water capacity, sandy layers
PbA:	
Patton	Ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth
PmA:	
Pewamo	Ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth, clodding, high clay content
RcA:	
Randolph	Seasonal high water table, surface compaction, depth to bedrock, high potential for ground-water pollution, frost action, surface crusting, limited available water capacity, high clay content
RgB:	
Rawson	Erosion hazard, wind erosion, limited available water capacity
RhA:	
Rensselaer, till substratum	Ponding, frost action
RnA:	
Rimer	Seasonal high water table, frost action, wind erosion, limited available water capacity, sandy layers
RoA:	
Rimer, deep phase	Seasonal high water table, high potential for ground-water pollution, frost action, wind erosion, sandy layers
RtA:	
Rossburg	Occasional flooding, surface compaction
SeA:	
Shawtown	No limitations or hazards

TABLE 8.--CROPLAND LIMITATIONS AND HAZARDS--Continued

Soil name and map symbol	Cropland limitations and hazards
SeB:	
Shawtown	Erosion hazard
SfB:	
Shinrock	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
SgC2:	
Shinrock	Part of the surface layer removed by erosion, seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, easily eroded, erosion hazard, clodding, high clay content
SkB:	
Shinrock, till substratum	Seasonal high water table, surface compaction, frost action, surface crusting, erosion hazard, high clay content
Glynwood	Seasonal high water table, surface compaction, frost action, fair tilth, surface crusting, erosion hazard, limited available water capacity, restricted permeability, clodding, high clay content
SmA:	
Shoals	Occasional flooding, seasonal high water table, surface compaction, moderate potential for ground-water pollution, frost action, surface crusting
SnA:	
Sloan	Occasional flooding, ponding, moderate potential for ground-water pollution, frost action
SoA:	
Sloan	Occasional flooding, ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth
SpA:	
Sloan, limestone substratum	Occasional flooding, ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth
StB2:	
St. Clair	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, erosion hazard, limited available water capacity, clodding, high clay content
StC2:	
St. Clair	Part of the surface layer removed by erosion, surface compaction, fair tilth, surface crusting, easily eroded, erosion hazard, limited available water capacity, clodding, high clay content
ThA:	
Thackery, till substratum	Seasonal high water table, high potential for ground-water pollution, frost action
TkA:	
Tiderishi	Seasonal high water table, frost action
TnA:	
Toledo	Ponding, surface compaction, moderate potential for ground-water pollution, frost action, fair tilth, clodding, high clay content
ToB:	
Tuscola	Moderate potential for ground-water pollution, frost action, erosion hazard, wind erosion
TpA:	
Tuscola	Moderate potential for ground-water pollution, frost action, wind erosion
TpB:	
Tuscola	Moderate potential for ground-water pollution, frost action, erosion hazard, wind erosion
TuB:	
Tuscola	Surface compaction, moderate potential for ground-water pollution, frost action, surface crusting, erosion hazard
VaA:	
Vanlue	Seasonal high water table, frost action
VeA:	
Vaughnsville	No limitations or hazards
WeA:	
Westland	Ponding, high potential for ground-water pollution, frost action
Rensselaer	Ponding, moderate potential for ground-water pollution, frost action

TABLE 9.--CROP YIELD INDEX

(This table is based on yields from the years 1992-2000. Estimated yields for soils with a yield index of 100 are: corn - 192 bushels; soybeans - 60 bushels; and wheat - 92 bushels. Refer to "Crop Yield Index" section in the text for more information on how this table was developed, and instructions on converting yield index numbers to estimated yields.)

Map symbol and soil name	corn yield index	soybean yield index	wheat yield index
AdA Adrian	76	76	---
AkA Alvada	87	94	82
AmA Alvada-Urban land	---	---	---
ApB Arkport	68	58	72
ArA Aurand	87	84	84
AsA Aurand-Urban land	---	---	---
BgA Biglick-Milton	53	56	55
BgB Biglick-Milton	52	51	55
BnA Blount	74	73	75
BoA Blount	74	73	75
BoB Blount	71	67	72
BpA Blount-Houcktown	75	74	75
BrA Blount-Jenera	75	76	76
BuA Blount-Urban land	---	---	---
ChC Channahon-Biglick	42	44	49
CoA Colwood	100	100	100
CtA Cygnet	81	82	75
CuA Cygnet-Urban land	---	---	---
DbA Darroch	90	91	84
DeA Del Rey	74	73	75
DfA Del Rey-Blount	74	73	75
DuB Dunbridge	58	54	54
EmA Elliott	87	82	82
FbA Flatrock	74	80	72
FcA Flatrock	74	76	67
FdA Flatrock, limestone substratum	74	76	67

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	corn yield index	soybean yield index	wheat yield index
FoA Fox	68	67	67
FoB Fox	68	64	67
FoC2 Fox	58	53	52
FsA Fulton	71	69	69
FtA Fulton, till substratum	71	69	69
GaB Gallman	71	64	67
GfA Gilford	84	76	82
GmA Glynwood, limestone substratum	74	78	75
GnB Glynwood	68	64	67
GpB2 Glynwood	61	58	54
GpC2 Glynwood	58	54	52
GsB Glynwood-Blount-Houcktown	67	65	72
GuB Glynwood-Urban land	---	---	---
HaA Harrod	64	73	---
HkA Haskins	71	76	66
HnA Haskins	74	80	69
HpA Houcktown	77	80	75
HpB Houcktown	74	73	75
HrB Houcktown-Glynwood-Jenera	72	69	72
HsA Hoytville	87	87	78
HtA Hoytville	84	87	78
JeA Jenera	77	82	79
JeB Jenera	74	69	75
JfB Jenera-Shinrock, till substratum	72	67	72
JoA Joliet	52	54	55
KnA Knoxdale	77	76	67

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	corn yield index	soybean yield index	wheat yield index
LbA Lamberjack	77	82	75
LcA Lamberjack-Urban land	---	---	---
LuB2 Lucas	61	58	57
LyE Lybrand	---	---	---
MbA Medway	77	82	69
McA Medway, limestone substratum	77	82	69
MeA Mermill	90	85	84
MfA Mermill	90	85	84
MgA Millsdale	74	76	67
MnA Milton	64	64	60
MpD3 Morley	---	---	---
MrA Morley, limestone substratum	74	78	75
MsB Morley, limestone substratum-Milton	62	64	64
MvB Mortimer	68	64	67
MwB2 Mortimer	61	60	60
NnA Nappanee	71	73	75
NnB Nappanee	64	67	67
NpA Nappanee	71	73	75
NpB2 Nappanee	61	64	63
NrA Nappanee-Urban land	---	---	---
OrA Oshtemo	64	62	72
OrB Oshtemo	61	54	67
OrC Oshtemo	58	53	63
OsB Oshtemo, till substratum	61	54	67
OwB Ottokee	61	58	60
PbA Patton	94	91	85

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	corn yield index	soybean yield index	wheat yield index
PmA Pewamo	90	80	82
PnA Pewamo-Urban land	---	---	---
RcA Randolph	71	64	63
RgB Rawson	71	73	72
RhA Rensselaer, till substratum	100	100	97
RnA Rimer	68	69	67
RoA Rimer, deep phase	68	73	67
RtA Rossburg	77	76	75
SeA Shawtown	81	76	72
SeB Shawtown	74	69	67
SfB Shinrock	71	69	67
SgC2 Shinrock	61	54	57
SkB Shinrock, till substratum-Glynwood	68	64	63
SmA Shoals	74	73	67
SnA Sloan	74	73	63
SoA Sloan	74	73	63
SpA Sloan, limestone substratum	74	69	60
StB2 St. Clair	58	54	60
StC2 St. Clair	52	47	52
ThA Thackery, till substratum	81	80	69
TkA Tiderishi	90	91	84
TnA Toledo	77	76	72
ToB Tuscola	68	64	67
TpA Tuscola	81	80	79
TpA Tuscola	77	69	75
TuB Tuscola	77	69	75

TABLE 9.--CROP YIELD INDEX--Continued

Map symbol and soil name	corn yield index	soybean yield index	wheat yield index
VaA Vanlue	74	76	82
VeA Vaughnsville	77	80	72
WeA Westland-Rensselaer	98	94	92

TABLE 10.--CAPABILITY CLASSES AND SUBCLASSES

Capability class	Capability subclass	Acreage
Unclassified	---	10,866
1	---	5,375
2	e	65,903
2	w	234,313
2	s	879
3	e	5,075
3	w	14,800
3	s	958
4	e	1,730
4	w	1,132
6	e	530

TABLE 11.--WOODLAND MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
AkA:						
Alvada	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
AmA:						
Alvada	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
ApB:						
Arkport	Slight		Low		Moderate	
	Water erosion	0.08			Low strength	0.50
ArA:						
Aurand	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
AsA:						
Aurand	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Milton	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
BgB:						
Biglick	Slight		Low		Severe	
	Water erosion	0.08			Low strength	1.00
Milton	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
BnA:						
Blount	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
BoA:						
Blount	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
BoB:						
Blount	Slight		High		Severe	
	Water erosion	0.07	Wetness	1.00	Low strength	1.00
BpA:						
Blount	Slight		High		Severe	
	Water erosion	0.05	Wetness	1.00	Low strength	1.00
Houcktown	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
BrA:						
Blount	Slight		High		Severe	
	Water erosion	0.05	Wetness	1.00	Low strength	1.00
Jenera	Slight		Low		Moderate	
	Water erosion	0.04			Low strength	0.50

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BuA:						
Blount	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Slight		Low		Severe	
	Water erosion	0.18			Low strength	1.00
Biglick	Slight		Low		Severe	
	Water erosion	0.18			Low strength	1.00
CoA:						
Colwood	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
CtA:						
Cygnet	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
CuA:						
Cygnet	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
DeA:						
Del Rey	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
DfA:						
Del Rey	Slight		High		Severe	
	Water erosion	0.05	Wetness	1.00	Low strength	1.00
Blount	Slight		High		Severe	
	Water erosion	0.05	Wetness	1.00	Low strength	1.00
DuB:						
Dunbridge	Slight		Low		Moderate	
	Water erosion	0.06			Low strength	0.50
EmA:						
Elliott	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
FbA:						
Flatrock	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
FcA:						
Flatrock	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
FdA:						
Flatrock, limestone substratum	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
FoA:						
Fox	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
FoB:						
Fox	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
FoC2:						
Fox	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
FsA:						
Fulton	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtA:						
Fulton, till substratum---------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
GaB:						
Gallman----------	Slight		Low		Severe	
	Water erosion	0.08			Low strength	1.00
GfA:						
Gilford----------	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
GmA:						
Glynwood, limestone substratum---------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
GnB:						
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
GpB2:						
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
GpC2:						
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
GsB:						
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
Blount----------	Slight		High		Severe	
	Water erosion	0.05	Wetness	1.00	Low strength	1.00
Houcktown----------	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
GuB:						
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Urban Land----------	Not rated		Not rated		Not rated	
HaA:						
Harrod----------	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
HkA:						
Haskins----------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
HnA:						
Haskins----------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
HpA:						
Houcktown----------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
HpB:						
Houcktown----------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
HrB:						
Houcktown----------	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
Glynwood----------	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
Jenera----------	Slight		Low		Moderate	
	Water erosion	0.06			Low strength	0.50
HsA:						
Hoytville----------	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HtA:						
Hoytville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
JeA:						
Jenera	Slight		Low		Moderate	
	Water erosion	0.02			Low strength	0.50
JeB:						
Jenera	Slight		Low		Moderate	
	Water erosion	0.08			Low strength	0.50
JfB:						
Jenera	Slight		Low		Moderate	
	Water erosion	0.06			Low strength	0.50
Shinrock, till substratum	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
JoA:						
Joliet	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
KnA:						
Knoxdale	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
LbA:						
Lamberjack	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
LcA:						
Lamberjack	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
LyE:						
Lybrand	Severe		Low		Severe	
	Water erosion	0.83			Low strength	1.00
MbA:						
Medway	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
McA:						
Medway, limestone substratum	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MeA:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MfA:						
Mermill	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MgA:						
Millsdale	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MnA:						
Milton	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MpD3:						
Morley	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
MrA:						
Morley, limestone substratum	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MsB:						
Morley, limestone substratum	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Milton	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MvB:						
Mortimer	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MwB2:						
Mortimer	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
NnA:						
Nappanee	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
NnB:						
Nappanee	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
NpA:						
Nappanee	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
NpB2:						
Nappanee	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
NrA:						
Nappanee	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Slight		Low		Moderate	
	Water erosion	0.02			Low strength	0.50
OrB:						
Oshtemo	Slight		Low		Moderate	
	Water erosion	0.08			Low strength	0.50
OrC:						
Oshtemo	Slight		Low		Moderate	
	Water erosion	0.18			Low strength	0.50
OsB:						
Oshtemo, till substratum	Slight		Low		Moderate	
	Water erosion	0.08			Low strength	0.50
OwB:						
Ottokee	Slight		Low		Moderate	
	Water erosion	0.06			Low strength	0.50
PbA:						
Patton	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
PmA:						
Pewamo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
PnA:						
Pewamo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RgB:						
Rawson	Slight		Low		Severe	
	Water erosion	0.08			Low strength	1.00
RhA:						
Rensselaer, till substratum	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
RnA:						
Rimer	Slight		High		Moderate	
	Water erosion	0.02	Wetness	1.00	Low strength	0.50
RoA:						
Rimer, deep phase	Slight		High		Moderate	
	Water erosion	0.02	Wetness	1.00	Low strength	0.50
RtA:						
Rossburg	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
SeA:						
Shawtown	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
SeB:						
Shawtown	Slight		Low		Severe	
	Water erosion	0.08			Low strength	1.00
SfB:						
Shinrock	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
SgC2:						
Shinrock	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
SkB:						
Shinrock, till substratum	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
Glynwood	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
SmA:						
Shoals	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
SnA:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
SoA:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
SpA:						
Sloan, limestone substratum	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
StB2:						
St. Clair	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
StC2:						
St. Clair	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
ThA:						
Thackery, till substratum	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
TkA:						
Tiderishi	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
TnA:						
Toledo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00

TABLE 11.--WOODLAND MANAGEMENT--Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ToB:						
Tuscola	Slight Water erosion	0.08	Low		Moderate Low strength	0.50
TpA:						
Tuscola	Slight Water erosion	0.02	Low		Severe Low strength	1.00
TpB:						
Tuscola	Slight Water erosion	0.08	Low		Severe Low strength	1.00
TuB:						
Tuscola	Slight Water erosion	0.08	Low		Severe Low strength	1.00
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Slight Water erosion	0.02	High Wetness	1.00	Severe Low strength	1.00
VeA:						
Vaughnsville	Slight Water erosion	0.04	Low		Severe Low strength	1.00
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00
Rensselaer	Slight Water erosion	0.01	High Wetness	1.00	Severe Low strength	1.00

TABLE 12.--WOODLAND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
AdA:				
Adrian	Black willow	---	---	Arborvitae, baldcypress, eastern cottonwood, green ash, red maple, silver maple, white ash.
	Red maple	51	29	
	Silver maple	76	29	
	White ash	51	29	
AkA:				
Alvada	Eastern cottonwood	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	85	72	
ApB:				
Arkport	Eastern white pine	85	143	Norway spruce, black cherry, black walnut, eastern white pine, northern red oak, sugar maple, tuliptree, white ash.
	Red pine	85	172	
	Sugar maple	70	43	
ArA:				
Aurand	Northern red oak	80	57	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	White oak	75	57	
BgA:				
Biglick	Bur oak	---	---	American basswood, eastern redcedar, eastern white pine, northern red oak, shortleaf pine, white oak.
	Eastern redcedar	---	---	
	Northern red oak	50	29	
	White oak	50	29	
Milton	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine,northern red oak, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Sugar maple	---	---	
	Tuliptree	95	100	
	White ash	---	---	
	White oak	---	---	
BgB:				
Biglick	Bur oak	---	---	American basswood, eastern redcedar, eastern white pine, northern red oak, shortleaf pine, white oak.
	Eastern redcedar	---	---	
	Northern red oak	50	29	
	White oak	50	29	
Milton	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine,northern red oak, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Sugar maple	---	---	
	Tuliptree	95	100	
	White ash	---	---	
	White oak	---	---	
BnA:				
Blount	Bur oak	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Northern red oak	65	43	
	Pin oak	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	65	43	
BoA:				
Blount	Bur oak	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Northern red oak	65	43	
	Pin oak	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	65	43	
BoB:				
Blount	Bur oak	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Northern red oak	65	43	
	Pin oak	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	65	43	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
BpA:				
Blount	Bur oak	---	---	American sycamore,black oak,
	Northern red oak	65	43	eastern cottonwood, eastern
	Pin oak	---	---	redcedar, green ash,
	Sugar maple	---	---	northern red oak, pin oak,
	White ash	---	---	red maple, silver maple,
	White oak	65	43	swamp white oak.
Houcktown	Black cherry	---	---	Norway spruce, black cherry,
	Northern red oak	80	57	black walnut, eastern white
	Pin oak	90	72	pine, green ash, northern
	Sugar maple	---	---	red oak, pin oak,tuliptree,
	Tuliptree	---	---	white ash, white oak.
	White ash	---	---	
	White oak	75	57	
BrA:				
Blount	Bur oak	---	---	American sycamore,black oak,
	Northern red oak	65	43	eastern cottonwood, eastern
	Pin oak	---	---	redcedar, green ash,
	Sugar maple	---	---	northern red oak, pin oak,
	White ash	---	---	red maple, silver maple,
	White oak	65	43	swamp white oak.
Jenera	Black cherry	---	---	Norway spruce, black cherry,
	Eastern cottonwood	---	---	black walnut, eastern white
	Green ash	---	---	pine, green ash, northern
	Pin oak	86	72	red oak, pin oak,tuliptree,
	Red maple	---	---	white ash, white oak.
	Swamp white oak	---	---	
ChC:				
Channahon	American basswood	---	---	American basswood, eastern
	Northern red oak	55	43	redcedar, eastern white
	Quaking aspen	---	---	pine, northern red oak,
	Sugar maple	---	---	shortleaf pine, white oak.
	White oak	---	---	
Biglick	Bur oak	---	---	American basswood, eastern
	Eastern redcedar	---	---	redcedar, eastern white
	Northern red oak	50	29	pine, northern red oak,
	White oak	50	29	shortleaf pine, white oak.
CoA:				
Colwood	Pin oak	90	72	American sycamore, Norway
	Red maple	---	---	spruce, eastern cottonwood,
	Swamp white oak	90	72	green ash, pin oak, red
	White ash	---	---	maple, silver maple, swamp
				white oak, sweetgum, white
				ash.
CtA:				
Cygnet	Black cherry	---	---	Norway spruce, black cherry,
	Black walnut	---	---	black walnut, eastern white
	Northern red oak	90	72	pine, green ash, northern
	Sugar maple	---	---	red oak, pin oak,tuliptree,
	Tuliptree	---	---	white ash, white oak.
	White ash	---	---	
	White oak	90	72	
DbA:				
Darroch	American basswood	---	---	American sycamore, Norway
	Northern red oak	66	57	spruce, black cherry,
	Quaking aspen	---	---	eastern cottonwood, eastern
	Red maple	---	---	redcedar, green ash, pin
	White ash	---	---	oak, red maple, silver
				maple, swamp white oak,
				tuliptree, white ash, white
				oak.
DeA:				
Del Rey	Bur oak	---	---	American sycamore,black oak,
	Green ash	---	---	eastern cottonwood, eastern
	Northern red oak	70	57	redcedar, green ash,
	White oak	70	57	northern red oak, pin oak,
				red maple, silver maple,
				swamp white oak.
DfA:				
Del Rey	Bur oak	---	---	American sycamore,black oak,
	Green ash	---	---	eastern cottonwood, eastern
	Northern red oak	70	57	redcedar, green ash,
	White oak	70	57	northern red oak, pin oak,
				red maple, silver maple,
				swamp white oak.

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
Blount	Bur oak	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Northern red oak	65	43	
	Pin oak	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	65	43	
DuB:				
Dunbridge	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine,northern red oak, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	75	57	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	70	57	
EmA:				
Elliott	American basswood	---	---	American sycamore, Norway spruce, black cherry, eastern cottonwood, eastern redcedar, green ash, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Northern red oak	66	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	White ash	---	---	
FbA:				
Flatrock	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Tuliptree	---	---	
	White oak	---	---	
FcA:				
Flatrock	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Tuliptree	---	---	
	White oak	---	---	
FdA:				
Flatrock, limestone substratum	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Tuliptree	---	---	
	White oak	---	---	
FoA:				
Fox	Black cherry	---	---	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
FoB:				
Fox	Black cherry	---	---	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
FoC2:				
Fox	Black cherry	---	---	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
FsA:				
Fulton	American beech	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Black cherry	---	---	
	Pin oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	---	---	
FtA:				
Fulton, till substratum	American beech	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Black cherry	---	---	
	Pin oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	---	---	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
GaB:				
Gallman	Black cherry	---	---	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	85	72	
GfA:				
Gilford	Eastern white pine	55	100	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Pin oak	70	57	
	Red maple	60	43	
GmA:				
Glynwood, limestone substratum	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
GnB:				
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
GpB2:				
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
GpC2:				
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
GsB:				
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
Blount	Bur oak	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Northern red oak	65	43	
	Pin oak	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	65	43	
Houcktown	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
HaA:				
Harrod	Green ash	---	---	Norway spruce, black oak, green ash,northern red oak, pin oak, tuliptree, white ash, white oak.
	Pin oak	85	5	
	Red maple	---	---	
	Swamp white oak	---	---	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
HkA:				
Haskins	Black cherry	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
HnA:				
Haskins	Black cherry	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
HpA:				
Houcktown	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak,pin oak, tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
HpB:				
Houcktown	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
HrB:				
Houcktown	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Pin oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
Jenera	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Eastern cottonwood	---	---	
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	---	---	
HsA:				
Hoytville	Black cherry	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Eastern cottonwood	---	---	
	Green ash	---	---	
	Northern red oak	72	57	
	Pin oak	76	57	
	Red maple	---	---	
	White ash	77	43	
HtA:				
Hoytville	Black cherry	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Eastern cottonwood	---	---	
	Green ash	---	---	
	Northern red oak	72	57	
	Pin oak	76	57	
	Red maple	---	---	
	White ash	77	43	
JeA:				
Jenera	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Eastern cottonwood	---	---	
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	---	---	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
JeB:				
Jenera	Black cherry	---	---	Norway spruce, black cherry,
	Eastern cottonwood	---	---	black walnut, eastern white
	Green ash	---	---	pine, green ash, northern
	Pin oak	86	72	red oak, pin oak,tuliptree,
	Red maple	---	---	white ash, white oak.
	Swamp white oak	---	---	
JfB:				
Jenera	Black cherry	---	---	Norway spruce, black cherry,
	Eastern cottonwood	---	---	black walnut, eastern white
	Green ash	---	---	pine, green ash, northern
	Pin oak	86	72	red oak, pin oak,tuliptree,
	Red maple	---	---	white ash, white oak.
	Swamp white oak	---	---	
Shinrock, till substratum	Black cherry	---	---	Austrian pine, black oak,
	Northern red oak	80	57	green ash, pin oak, red
	Red maple	---	---	maple, tuliptree,white ash,
	Slippery elm	---	---	white oak.
	White ash	---	---	
	White oak	---	---	
JoA:				
Joliet	American basswood	---	---	American basswood, eastern
	Northern red oak	55	43	redcedar, eastern white
	Quaking aspen	---	---	pine, northern red oak,
	Sugar maple	---	---	shortleaf pine, white oak.
	White oak	---	---	
KnA:				
Knoxdale	Black cherry	---	---	Black cherry, black walnut,
	Black walnut	---	---	eastern white pine,northern
	Tuliptree	100	114	red oak, sugar maple,
	White ash	---	---	tuliptree, white ash, white
	White oak	90	72	oak.
LbA:				
Lamberjack	Black cherry	---	---	American sycamore, Norway
	Northern red oak	80	57	spruce, black cherry, black
	Pin oak	---	---	oak, eastern cottonwood,
	Sugar maple	---	---	eastern redcedar,green ash,
	Tuliptree	---	---	northern red oak, pin oak,
	White ash	---	---	red maple, silver maple,
	White oak	75	57	swamp white oak, tuliptree,
				white ash, white oak.
LuB2:				
Lucas	Black cherry	---	---	Austrian pine, black oak,
	Northern red oak	70	57	green ash, pin oak, red
	Red maple	---	---	maple, tuliptree,white ash,
	Slippery elm	---	---	white oak.
	White ash	---	---	
	White oak	---	---	
LyE:				
Lybrand	Black walnut	---	---	Norway spruce, black cherry,
	Bur oak	---	---	black walnut, eastern white
	Northern red oak	80	57	pine, green ash, northern
	Shagbark hickory	---	---	red oak, tuliptree, white
	Tuliptree	90	86	oak.
	White oak	80	57	
MbA:				
Medway	Black cherry	---	---	Norway spruce, black cherry,
	Black walnut	---	---	black walnut, eastern white
	Northern red oak	86	72	pine, green ash, northern
	Sugar maple	---	---	red oak, pin oak,tuliptree,
	Tuliptree	96	100	white ash, white oak.
	White ash	---	---	
	White oak	---	---	
McA:				
Medway, limestone substratum	Black cherry	---	---	Norway spruce, black cherry,
	Black walnut	---	---	black walnut, eastern white
	Northern red oak	86	72	pine, green ash, northern
	Sugar maple	---	---	red oak, pin oak,tuliptree,
	Tuliptree	96	100	white ash, white oak.
	White ash	---	---	
	White oak	---	---	
MeA:				
Mermill	Eastern cottonwood	---	---	American sycamore, Norway
	Green ash	---	---	spruce, eastern cottonwood,
	Pin oak	90	72	green ash, pin oak, red
	Red maple	---	---	maple, silver maple, swamp
	Swamp white oak	90	72	white oak, sweetgum, white
				ash.

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
MfA:				
Mermill	Eastern cottonwood	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Green ash	---	---	
	Pin oak	90	72	
	Red maple	---	---	
	Swamp white oak	90	72	
MgA:				
Millsdale	Black cherry	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Eastern cottonwood	---	---	
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	---	---	
MnA:				
Milton	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine,northern red oak, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Sugar maple	---	---	
	Tuliptree	95	100	
	White ash	---	---	
	White oak	---	---	
MpD3:				
Morley	Black oak	89	72	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Eastern white pine	74	157	
	Tuliptree	105	114	
MrA:				
Morley, limestone substratum	Black oak	89	72	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Eastern white pine	74	157	
	Tuliptree	105	114	
MsB:				
Morley, limestone substratum	Black oak	89	72	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Eastern white pine	74	157	
	Tuliptree	105	114	
Milton	Black cherry	---	---	American basswood, black walnut, eastern redcedar, eastern white pine,northern red oak, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	80	57	
	Sugar maple	---	---	
	Tuliptree	95	100	
	White ash	---	---	
	White oak	---	---	
MvB:				
Mortimer	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
MwB2:				
Mortimer	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	
NnA:				
Nappanee	American sycamore	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Pin oak	85	72	
	Sweetgum	80	86	
	White oak	75	72	
NnB:				
Nappanee	American sycamore	---	---	American sycamore,black oak, eastern cottonwood, eastern redcedar, green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak.
	Pin oak	85	72	
	Sweetgum	80	86	
	White oak	75	72	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
NpA:				
Nappanee	American sycamore	---	---	American sycamore,black oak,
	Pin oak	85	72	eastern cottonwood, eastern
	Sweetgum	80	86	redcedar, green ash,
	White oak	75	72	northern red oak, pin oak,
				red maple, silver maple,
				swamp white oak.
NpB2:				
Nappanee	American sycamore	---	---	American sycamore,black oak,
	Pin oak	85	72	eastern cottonwood, eastern
	Sweetgum	80	86	redcedar, green ash,
	White oak	75	72	northern red oak, pin oak,
				red maple, silver maple,
				swamp white oak.
OrA:				
Oshtemo	Black cherry	---	---	Black cherry, black walnut,
	Black walnut	---	---	eastern white pine,northern
	Northern red oak	70	57	red oak, sugar maple,
	Sugar maple	---	---	tuliptree, white ash, white
	Tuliptree	---	---	oak.
	White ash	---	---	
	White oak	---	---	
OrB:				
Oshtemo	Black cherry	---	---	Black cherry, black walnut,
	Black walnut	---	---	eastern white pine,northern
	Northern red oak	70	57	red oak, sugar maple,
	Sugar maple	---	---	tuliptree, white ash, white
	Tuliptree	---	---	oak.
	White ash	---	---	
	White oak	---	---	
OrC:				
Oshtemo	Black cherry	---	---	Black cherry, black walnut,
	Black walnut	---	---	eastern white pine,northern
	Northern red oak	70	57	red oak, sugar maple,
	Sugar maple	---	---	tuliptree, white ash, white
	Tuliptree	---	---	oak.
	White ash	---	---	
	White oak	---	---	
OsB:				
Oshtemo, till substratum	Black cherry	---	---	Black cherry, black walnut,
	Black walnut	---	---	eastern white pine,northern
	Northern red oak	70	57	red oak, sugar maple,
	Sugar maple	---	---	tuliptree, white ash, white
	Tuliptree	---	---	oak.
	White ash	---	---	
	White oak	---	---	
OwB:				
Ottokee	Bur oak	---	---	Black oak, black walnut,
	Green ash	---	---	eastern white pine,northern
	Northern red oak	70	57	red oak, white ash, white
	Red maple	---	---	oak.
	Slippery elm	---	---	
	White ash	---	---	
	White oak	65	43	
PbA:				
Patton	Northern red oak	75	57	American sycamore, Norway
	Pin oak	85	72	spruce, eastern cottonwood,
	Sweetgum	80	86	green ash, pin oak, red
	White oak	75	57	maple, silver maple, swamp
				white oak, sweetgum, white
				ash.
PmA:				
Pewamo	Eastern cottonwood	98	129	American sycamore, Norway
	Green ash	---	---	spruce, eastern cottonwood,
	Pin oak	90	72	green ash, pin oak, red
	Red maple	71	43	maple, silver maple, swamp
	Swamp white oak	---	---	white oak, sweetgum, white
	White ash	71	72	ash.
RcA:				
Randolph	Northern red oak	75	57	American sycamore,black oak,
	Sugar maple	90	57	eastern cottonwood, eastern
	Tuliptree	85	86	redcedar, green ash,
				northern red oak, pin oak,
				red maple, silver maple,
				swamp white oak.

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
RgB:				
Rawson	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Northern red oak	80	57	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	75	57	
RhA:				
Rensselaer, till substratum	Northern red oak	76	57	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Pin oak	86	72	
	Sweetgum	90	100	
	White oak	75	57	
RnA:				
Rimer	Black oak	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Bur oak	---	---	
	Green ash	---	---	
	Northern red oak	80	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	Slippery elm	---	---	
	White oak	75	57	
RoA:				
Rimer, deep phase	Black oak	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Bur oak	---	---	
	Green ash	---	---	
	Northern red oak	80	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	Slippery elm	---	---	
	White oak	75	57	
RtA:				
Rossburg	Black cherry	---	---	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	---	---	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	90	72	
SeA:				
Shawtown	American basswood	66	57	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Eastern white pine	85	200	
	White oak	70	57	
SeB:				
Shawtown	American basswood	66	57	Black cherry, black walnut, eastern white pine,northern red oak, sugar maple, tuliptree, white ash, white oak.
	Eastern white pine	85	200	
	White oak	70	57	
SfB:				
Shinrock	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	---	---	
SgC2:				
Shinrock	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	---	---	
SkB:				
Shinrock, till substratum	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	---	---	
Glynwood	Black cherry	---	---	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Black oak	80	57	
	Northern red oak	80	57	
	Red maple	---	---	
	Slippery elm	---	---	
	White ash	---	---	
	White oak	80	57	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
SmA:				
Shoals	Virginia pine	90	129	American sycamore, eastern cottonwood, pin oak, red maple, swamp white oak, sweetgum, tuliptree.
	Eastern cottonwood	---	---	
	Pin oak	90	72	
	Sweetgum	86	100	
	Tuliptree	90	86	
	White ash	---	---	
SnA:				
Sloan	Eastern cottonwood	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	---	---	
SoA:				
Sloan	Eastern cottonwood	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Green ash	---	---	
	Pin oak	86	72	
	Red maple	---	---	
	Swamp white oak	---	---	
SpA:				
Sloan, limestone substratum	Black oak	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Bur oak	---	---	
	Green ash	---	---	
	Northern red oak	80	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	Slippery elm	---	---	
	White oak	75	57	
StB2:				
St. Clair	Northern red oak	66	43	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Sugar maple	---	---	
	White ash	---	---	
	White oak	62	43	
StC2:				
St. Clair	Northern red oak	66	43	Austrian pine, black oak, green ash, pin oak, red maple, tuliptree,white ash, white oak.
	Sugar maple	---	---	
	White ash	---	---	
	White oak	62	43	
ThA:				
Thackery, till substratum	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	90	72	
TkA:				
Tiderishi	American basswood	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Northern red oak	66	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	White ash	---	---	
TnA:				
Toledo	Eastern cottonwood	---	---	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Green ash	---	---	
	Pin oak	80	57	
	Red maple	---	---	
	Swamp white oak	80	57	
ToB:				
Tuscola	American basswood	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	86	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	---	---	

TABLE 12.--WOODLAND PRODUCTIVITY--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber *	Suggested trees to plant
TpA:				
Tuscola	American basswood	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	86	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	---	---	
TpB:				
Tuscola	American basswood	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	86	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	---	---	
TuB:				
Tuscola	American basswood	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	86	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	---	---	
VaA:				
Vanlue	American basswood	---	---	American sycamore, Norway spruce, black cherry, black oak, eastern cottonwood, eastern redcedar,green ash, northern red oak, pin oak, red maple, silver maple, swamp white oak, tuliptree, white ash, white oak.
	Northern red oak	66	57	
	Quaking aspen	---	---	
	Red maple	---	---	
	White ash	---	---	
VeA:				
Vaughnsville	Black cherry	---	---	Norway spruce, black cherry, black walnut, eastern white pine, green ash, northern red oak, pin oak,tuliptree, white ash, white oak.
	Black walnut	---	---	
	Northern red oak	90	72	
	Sugar maple	---	---	
	Tuliptree	---	---	
	White ash	---	---	
	White oak	90	72	
WeA:				
Westland	Pin oak	85	72	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Sweetgum	90	100	
	White oak	75	57	
Rensselaer	Northern red oak	76	57	American sycamore, Norway spruce, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum, white ash.
	Pin oak	86	72	
	Sweetgum	90	100	
	White oak	75	57	

* Volume is expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

TABLE 13.--WOODLAND HARVESTING ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Severe		Poorly suited		Poorly suited	
	Low strength	1.00	Ponding	1.00	Low strength	1.00
			Low strength	1.00		
			Depth to saturated zone	1.00		
AkA:						
Alvada	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
AmA:						
Alvada	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
ApB:						
Arkport	Slight		Well suited		Well suited	
ArA:						
Aurand	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
AsA:						
Aurand	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Severe		Moderately well suited		Moderately well suited	
	Depth to bedrock	1.00	Low strength	0.50	Low strength	0.50
	Low strength	0.50				
Milton	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
BgB:						
Biglick	Severe		Moderately well suited		Moderately well suited	
	Depth to bedrock	1.00	Low strength	0.50	Low strength	0.50
	Low strength	0.50				
Milton	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
BnA:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BoA:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
BoB:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
BpA:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Houcktown	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
BrA:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Jenera	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
BuA:						
Blount	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Severe		Moderately well suited		Moderately well suited	
	Depth to bedrock	1.00	Slope	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
Biglick	Severe		Moderately well suited		Moderately well suited	
	Depth to bedrock	1.00	Slope	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
CoA:						
Colwood	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
CtA:						
Cygnet	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
CuA:						
Cygnet	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Urban Land	Not rated		Not rated		Not rated	

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DbA:						
Darroch----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
DeA:						
Del Rey----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
DfA:						
Del Rey----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Blount----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
DuB:						
Dunbridge----------	Moderate		Well suited		Well suited	
	Depth to bedrock	0.50				
EmA:						
Elliott----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
FbA:						
Flatrock----------	Moderate		Moderately well suited		Moderately well suited	
	Flooding	0.50	Flooding	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
FcA:						
Flatrock----------	Moderate		Moderately well suited		Moderately well suited	
	Flooding	0.50	Flooding	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
FdA:						
Flatrock, limestone substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Flooding	0.50	Flooding	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
FoA:						
Fox----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
FoB:						
Fox----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
FoC2:						
Fox----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
FsA:						
Fulton----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
FtA:						
Fulton, till substratum---------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
GaB:						
Gallman----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
GfA:						
Gilford----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
GmA:						
Glynwood, limestone substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
GnB:						
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
GpB2:						
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
GpC2:						
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
			Depth to saturated zone	0.50		
GsB:						
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Blount----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Houcktown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
GuB:						
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Urban Land----------	Not rated		Not rated		Not rated	
HaA:						
Harrod----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
	Depth to bedrock	0.50	Depth to saturated zone	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HkA:						
Haskins----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
HnA:						
Haskins----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
HpA:						
Houcktown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
HpB:						
Houcktown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
HrB:						
Houcktown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Jenera----------	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
HsA:						
Hoytville----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
HtA:						
Hoytville----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
JeA:						
Jenera----------	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
JeB:						
Jenera----------	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
JfB:						
Jenera----------	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
Shinrock, till substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JoA:						
Joliet----------	Severe		Poorly suited		Moderately well suited	
	Depth to bedrock	1.00	Depth to saturated zone	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
KnA:						
Knoxdale----------	Moderate		Moderately well suited		Moderately well suited	
	Flooding	0.50	Flooding	0.50	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
LbA:						
Lamberjack----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
LcA:						
Lamberjack----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Urban Land----------	Not rated		Not rated		Not rated	
LuB2:						
Lucas----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LyE:						
Lybrand----------	Severe		Poorly suited		Moderately well suited	
	Slope	1.00	Slope	1.00	Slope	0.50
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MbA:						
Medway----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
McA:						
Medway, limestone substratum---------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
MeA:						
Mermill----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MfA:						
Mermill----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MgA:						
Millsdale----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Depth to bedrock	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		
MnA:						
Milton----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpD3:						
Morley----------	Moderate		Poorly suited		Moderately well suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MrA:						
Morley, limestone substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MsB:						
Morley, limestone substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Milton----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
MvB:						
Mortimer----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
MwB2:						
Mortimer----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
NnA:						
Nappanee----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NnB:						
Nappanee----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NpA:						
Nappanee----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NpB2:						
Nappanee----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
NrA:						
Nappanee----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
			Low strength	0.50		
Urban Land----------	Not rated		Not rated		Not rated	
OrA:						
Oshtemo----------	Slight		Well suited		Well suited	
OrB:						
Oshtemo----------	Slight		Well suited		Well suited	
OrC:						
Oshtemo----------	Slight		Moderately well suited		Well suited	
			Slope	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OsB:						
Oshtemo, till substratum---------	Slight		Well suited		Well suited	
OwB:						
Ottokee----------	Slight		Well suited		Well suited	
PbA:						
Patton----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
PmA:						
Pewamo----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
PnA:						
Pewamo----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Urban Land----------	Not rated		Not rated		Not rated	
Pt:						
Pits----------	Not rated		Not rated		Not rated	
RcA:						
Randolph----------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
	Depth to bedrock	0.50	Low strength	0.50		
RgB:						
Rawson----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RhA:						
Rensselaer, till substratum---------	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
RnA:						
Rimer----------	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
RoA:						
Rimer, deep phase---	Slight		Moderately well suited		Well suited	
			Depth to saturated zone	0.50		
RtA:						
Rossburg----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
SeA:						
Shawtown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
SeB:						
Shawtown----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SfB:						
Shinrock----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
SgC2:						
Shinrock----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
			Depth to saturated zone	0.50		
SkB:						
Shinrock, till substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
Glynwood----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
SmA:						
Shoals----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Depth to saturated zone	0.50		
			Low strength	0.50		
SnA:						
Sloan----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
SoA:						
Sloan----------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
SpA:						
Sloan, limestone substratum---------	Severe		Poorly suited		Moderately well suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
StB2:						
St. Clair----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Stickiness	0.50				
StC2:						
St. Clair----------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
ThA:						
Thackery, till substratum---------	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		

TABLE 13.--WOODLAND HARVESTING ACTIVITIES--Continued

Map symbol and soil name	Construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TkA:						
Tiderishi	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
TnA:						
Toledo	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
ToB:						
Tuscola	Slight		Well suited		Well suited	
TpA:						
Tuscola	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
TpB:						
Tuscola	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
TuB:						
Tuscola	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
VeA:						
Vaughnsville	Moderate		Moderately well suited		Moderately well suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
Rensselaer	Moderate		Poorly suited		Moderately well suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		

TABLE 14.--WOODLAND REGENERATION ACTIVITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Well suited		Well suited		Low	
AkA:						
Alvada	Well suited		Well suited		Low	
AmA:						
Alvada	Well suited		Well suited		Low	
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
ApB:						
Arkport	Well suited		Well suited		High	
					Texture/rock fragments	1.00
ArA:						
Aurand	Well suited		Well suited		Low	
AsA:						
Aurand	Well suited		Well suited		Low	
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
Milton	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
BgB:						
Biglick	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
Milton	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
BnA:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
BoA:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
BoB:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
BpA:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Houcktown	Well suited		Well suited		Low	
BrA:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Jenera	Well suited		Well suited		Low	

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BuA:						
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Poorly suited		Well suited		Low	
	Rock fragment content	0.75				
	Slope	0.50				
Biglick	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
	Slope	0.50				
CoA:						
Colwood	Well suited		Well suited		Low	
CtA:						
Cygnet	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				
CuA:						
Cygnet	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Well suited		Well suited		Low	
DeA:						
Del Rey	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
DfA:						
Del Rey	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
DuB:						
Dunbridge	Moderately well suited		Well suited		Moderate	
	Rock fragment content	0.50			Texture/rock fragments	0.50
EmA:						
Elliott	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
FbA:						
Flatrock	Well suited		Well suited		Low	
FcA:						
Flatrock	Well suited		Well suited		Low	
FdA:						
Flatrock, limestone substratum	Well suited		Well suited		Low	
FoA:						
Fox	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				
FoB:						
Fox	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoC2:						
Fox	Moderately well suited		Well suited		Moderate	
	Rock fragment content	0.50			Texture/rock fragments	0.50
	Slope	0.50				
FsA:						
Fulton	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
FtA:						
Fulton, till substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
GaB:						
Gallman	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				
GfA:						
Gilford	Well suited		Well suited		Low	
GmA:						
Glynwood, limestone substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
GnB:						
Glynwood	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
GpB2:						
Glynwood	Moderately well suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.70
GpC2:						
Glynwood	Moderately well suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.70
	Slope	0.50				
GsB:						
Glynwood	Moderately well suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Blount	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Houcktown	Well suited		Well suited		Low	
GuB:						
Glynwood	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Urban Land	Not rated		Not rated		Not rated	
HaA:						
Harrod	Well suited		Well suited		Low	
HkA:						
Haskins	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
HnA:						
Haskins	Well suited		Well suited		Low	
HpA:						
Houcktown	Well suited		Well suited		Low	
HpB:						
Houcktown	Well suited		Well suited		Low	

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HrB:						
Houcktown	Well suited		Well suited		Low	
Glynwood	Moderately well suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Jenera	Well suited		Well suited		Low	
HsA:						
Hoytville	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
HtA:						
Hoytville	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
JeA:						
Jenera	Well suited		Well suited		Low	
JeB:						
Jenera	Well suited		Well suited		Low	
JfB:						
Jenera	Well suited		Well suited		Low	
Shinrock, till substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
JoA:						
Joliet	Moderately well suited		Well suited		Low	
	Rock fragment content	0.50				
KnA:						
Knoxdale	Well suited		Well suited		Low	
LbA:						
Lamberjack	Well suited		Well suited		Low	
LcA:						
Lamberjack	Well suited		Well suited		Low	
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
LyE:						
Lybrand	Unsuited		Poorly suited		Low	
	Slope	1.00	Slope	0.50	Texture/slope/ rock fragments	0.30
	Stickiness	0.50				
MbA:						
Medway	Well suited		Well suited		Low	
McA:						
Medway, limestone substratum	Well suited		Well suited		Low	
MeA:						
Mermill	Well suited		Well suited		Low	
MfA:						
Mermill	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
MgA:						
Millsdale	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MnA:						
Milton	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
MpD3:						
Morley	Moderately well suited		Poorly suited		Moderate	
	Slope	0.50	Slope	0.50	Texture/rock fragments	0.50
	Stickiness	0.50				
MrA:						
Morley, limestone substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
MsB:						
Morley, limestone substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Milton	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
MvB:						
Mortimer	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
MwB2:						
Mortimer	Moderately well suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.70
NnA:						
Nappanee	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
NnB:						
Nappanee	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
NpA:						
Nappanee	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.30
NpB2:						
Nappanee	Moderately well suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.70
NrA:						
Nappanee	Moderately well suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50		
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
OrB:						
Oshtemo	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
OrC:						
Oshtemo	Moderately well suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
OsB:						
Oshtemo, till substratum	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
OwB:						
Ottokee	Well suited		Well suited		High	
					Texture/rock fragments	1.00
PbA:						
Patton	Well suited		Well suited		Low	
					Texture/rock fragments	0.30
PmA:						
Pewamo	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
PnA:						
Pewamo	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
RgB:						
Rawson	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RhA:						
Rensselaer, till substratum	Well suited		Well suited		Low	
RnA:						
Rimer	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RoA:						
Rimer, deep phase	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RtA:						
Rossburg	Well suited		Well suited		Low	
SeA:						
Shawtown	Well suited		Well suited		Low	
SeB:						
Shawtown	Well suited		Well suited		Low	
SfB:						
Shinrock	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
SgC2:						
Shinrock	Moderately well suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.70
	Stickiness	0.50				
SkB:						
Shinrock, till substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50				
Glynwood	Moderately well suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.70

TABLE 14.--WOODLAND REGENERATION ACTIVITIES--Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SmA:						
Shoals	Well suited		Well suited		Low	
SnA:						
Sloan	Well suited		Well suited		Low	
SoA:						
Sloan	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
SpA:						
Sloan, limestone substratum	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
StB2:						
St. Clair	Moderately well suited		Poorly suited		High	
	Stickiness	0.50	Stickiness	0.50	Texture/surface depth/rock fragments	1.00
StC2:						
St. Clair	Moderately well suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.70
	Slope	0.50				
ThA:						
Thackery, till substratum	Well suited		Well suited		Low	
TkA:						
Tiderishi	Well suited		Well suited		Low	
TnA:						
Toledo	Moderately well suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
ToB:						
Tuscola	Well suited		Well suited		High	
					Texture/rock fragments	1.00
TpA:						
Tuscola	Well suited		Well suited		Low	
TpB:						
Tuscola	Well suited		Well suited		Low	
TuB:						
Tuscola	Well suited		Well suited		Low	
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Well suited		Well suited		Low	
VeA:						
Vaughnsville	Well suited		Well suited		Low	
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Well suited		Well suited		Low	
Rensselaer	Well suited		Well suited		Low	

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AdA:					
Adrian	common ninebark, silky dogwood	nannyberry	black willow	---	---
AkA:					
Alvada	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
AmA:					
Alvada	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
Urban land	---	---	---	---	---
AnA:					
Aquents	---	---	---	---	---
ApB:					
Arkport	redbud	American cranberrybush, Washington hawthorn	Austrian pine, osageorange	arborvitae, Norway spruce, eastern white pine	northern red oak
ArA:					
Aurand	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
AsA:					
Aurand	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
Urban land	---	---	---	---	---
BgA:					
Biglick	redbud	Washington hawthorn, eastern redcedar, arborvitae	chinkapin oak	---	---
Milton	Japanese tree lilac, Siberian peashrub, redbud	Washington hawthorn, eastern redcedar, radiant crabapple	Austrian pine, osageorange, eastern white pine	---	---
BgB:					
Biglick	redbud	Washington hawthorn, eastern redcedar, arborvitae	chinkapin oak	---	---
Milton	Japanese tree lilac, Siberian peashrub, redbud	Washington hawthorn, eastern redcedar, radiant crabapple	Austrian pine, osageorange, eastern white pine	---	---
BnA:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
BoA:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
BoB:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
BpA:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Houcktown	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
BrA:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Jenera	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
BuA:					
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Urban land	---	---	---	---	---
ChC:					
Channahon	redbud	Washington hawthorn, eastern redcedar, arborvitae	chinkapin oak	---	---
Biglick	redbud	Washington hawthorn, eastern redcedar, arborvitae	chinkapin oak	---	---
CoA:					
Colwood	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
CtA:					
Cygnet	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
CuA:					
Cygnet	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
Urban land	---	---	---	---	---
DbA:					
Darroch	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
DeA:					
Del Rey	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
DfA:					
Del Rey	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
DuB:					
Dunbridge	Japanese tree lilac, Siberian peashrub, redbud	Washington hawthorn, eastern redcedar, radiant crabapple	Austrian pine, osageorange, eastern white pine	---	---
EmA:					
Elliott	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
FbA:					
Flatrock	silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, blue spruce, arborvitae	Austrian pine, Norway spruce	pin oak, eastern white pine
FcA:					
Flatrock	silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, blue spruce, arborvitae	Austrian pine, Norway spruce	pin oak, eastern white pine
FdA:					
Flatrock, limestone substratum	silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, blue spruce, arborvitae	Austrian pine, Norway spruce	pin oak, eastern white pine

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
FoA:					
Fox	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
FoB:					
Fox	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
FoC2:					
Fox	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
FsA:					
Fulton	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
FtA:					
Fulton, till substratum	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
GaB:					
Gallman	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
GfA:					
Gilford	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
GmA:					
Glynwood, limestone substratum	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
GnB:					
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
GpB2:					
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern	baldcypress, osageorange, Austrian pine,	Norway spruce, green ash, black oak, pin oak	northern red oak
GpC2:					
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
GsB:					
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
Blount	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Houcktown	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
GuB:					
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
Urban land	---	---	---	---	---
HaA:					
Harrod	American cranberrybush, redbud	southern arrowwood, Washington hawthorn	Austrian pine, arborvitae, Norway spruce	eastern white pine, green ash, pin oak	northern red oak
HkA:					
Haskins	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
HnA:					
Haskins	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
HpA:					
Houcktown	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
HpB:					
Houcktown	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
HrB:					
Houcktown	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
Jenera	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
HsA:					
Hoytville	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HtA:					
Hoytville	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
JeA:					
Jenera	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
JeB:					
Jenera	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
JfB:					
Jenera	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
Shinrock, till substratum	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
JoA:					
Joliet	European alder, silky dogwood	baldcypress, arborvitae	green ash	---	---
KnA:					
Knoxdale	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
LbA:					
Lamberjack	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
LcA:					
Lamberjack	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
Urban land	---	---	---	---	---
LuB2:					
Lucas	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
LyE:					
Lybrand	American cranberrybush	Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, Austrian pine	green ash, eastern white pine	northern red oak
MbA:					
Medway	silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, blue spruce, arborvitae	Austrian pine, Norway spruce	pin oak, eastern white pine

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
McA:					
Medway, limestone substratum	silky dogwood	American cranberrybush, blackhaw, European alder, Washington hawthorn, eastern redcedar, southern arrowwood	osageorange, blue spruce, arborvitae	Austrian pine, Norway spruce	pin oak, eastern white pine
MeA:					
Mermill	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
MfA:					
Mermill	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
MgA:					
Millsdale	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
MnA:					
Milton	Japanese tree lilac, Siberian peashrub, redbud	Washington hawthorn, eastern redcedar, radiant crabapple	Austrian pine, osageorange, eastern white pine	---	---
MpD3:					
Morley	American cranberrybush, redbud	southern arrowwood, Washington hawthorn	Austrian pine, arborvitae, Norway spruce	eastern white pine, green ash, pin oak	northern red oak
MrA:					
Morley, limestone substratum	American cranberrybush, redbud	southern arrowwood, Washington hawthorn	Austrian pine, arborvitae, Norway spruce	eastern white pine, green ash, pin oak	northern red oak
MsB:					
Morley, limestone substratum	American cranberrybush, redbud	southern arrowwood, Washington hawthorn	Austrian pine, arborvitae, Norway spruce	eastern white pine, green ash, pin oak	northern red oak
Milton	Japanese tree lilac, Siberian peashrub, redbud	Washington hawthorn, eastern redcedar, radiant crabapple	Austrian pine, osageorange, eastern white pine	---	---
MvB:					
Mortimer	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
MwB2:					
Mortimer	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
NnA:					
Nappanee	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
NnB:					
Nappanee	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
NpA:					
Nappanee	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
NpB2:					
Nappanee	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
NrA:					
Nappanee	silky dogwood, southern arrowwood	American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, eastern redcedar	green ash, osageorange, Austrian pine, Norway spruce, arborvitae	Shumard's oak, pin oak	swamp white oak
Urban land	---	---	---	---	---
OrA:					
Oshtemo	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
OrB:					
Oshtemo	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
OrC:					
Oshtemo	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
OsB:					
Oshtemo, till substratum	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, eastern white pine, white ash
OwB:					
Ottokee	redbud	American cranberrybush, Washington hawthorn	blue spruce, arborvitae	Austrian pine, Norway spruce	eastern white pine
PbA:					
Patton	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
PmA:					
Pewamo	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
PnA:					
Pewamo	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
Urban land	---	---	---	---	---
Pt:					
Pits	---	---	---	---	---
RcA:					
Randolph	silky dogwood	American cranberrybush, American cranberrybush, European alder, Washington hawthorn, baldcypress, blackhaw, southern arrowwood	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
RgB:					
Rawson	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
RhA:					
Rensselaer, till substratum	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
RnA:					
Rimer	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
RoA:					
Rimer, deep phase	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
RtA:					
Rossburg	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
SeA:					
Shawtown	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
SeB:					
Shawtown	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
SfB:					
Shinrock	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
SgC2:					
Shinrock	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
SkB:					
Shinrock, till substratum	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
Glynwood	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
SmA:					
Shoals	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
SnA:					
Sloan	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
SoA:					
Sloan	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
SpA:					
Sloan, limestone substratum	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
StB2:					
St. Clair	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
StC2:					
St. Clair	American cranberrybush, blackhaw	southern arrowwood, Washington hawthorn, eastern redcedar	baldcypress, osageorange, Austrian pine, arborvitae	Norway spruce, green ash, black oak, pin oak	northern red oak
ThA:					
Thackery, till substratum	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
TkA:					
Tiderishi	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
TnA:					
Toledo	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak

TABLE 15.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
ToB:					
Tuscola	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
TpA:					
Tuscola	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
TpB:					
Tuscola	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
TuB:					
Tuscola	silky dogwood	American cranberrybush, European alder, Washington hawthorn	white fir, baldcypress, blue spruce, eastern redcedar, arborvitae	Austrian pine, Norway spruce, green ash, pin oak	eastern white pine
UcA:					
Udorthents	---	---	---	---	---
UcD:					
Udorthents	---	---	---	---	---
Ur:					
Urban land	---	---	---	---	---
VaA:					
Vanlue	silky dogwood	American cranberrybush, European alder, Washington hawthorn	baldcypress, eastern redcedar, arborvitae, Austrian pine	pin oak, Norway spruce	green ash
VeA:					
Vaughnsville	Japanese tree lilac, Siberian peashrub, redbud	European alder, radiant crabapple, Siberian crabapple, Washington hawthorn, eastern redcedar	Austrian pine, osageorange, blue spruce, eastern white pine, Norway spruce, arborvitae	white oak, white spruce	northern red oak, white ash, eastern white pine
WeA:					
Westland	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak
Rensselaer	silky dogwood	American cranberrybush, European alder, baldcypress	Washington hawthorn, arborvitae, Austrian pine, eastern redcedar, green ash	Norway spruce, swamp white oak	pin oak

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Depth to saturated zone	1.00
AkA:						
Alvada	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
AmA:						
Alvada	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
ApB:						
Arkport	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
					Slope	0.50
ArA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
Milton	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
BgB:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Slope	0.50
					Restricted permeability	0.43
Milton	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.80
					Slope	0.50
					Restricted permeability	0.21

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BnA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
BoA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
BoB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.13
BpA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.00
Houcktown	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
					Slope	0.00
BrA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.00
Jenera	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.00
BuA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to bedrock	1.00
					Gravel content	0.02
					Content of large stones	0.01
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Depth to bedrock	1.00
	Slope	0.04	Slope	0.04	Restricted permeability	0.43
CoA:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CtA:						
Cygnet	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Gravel content	0.06
CuA:						
Cygnet	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Gravel content	0.06
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
DeA:						
Del Rey	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.94	Restricted permeability	0.96
DfA:						
Del Rey	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.94	Restricted permeability	0.96
					Slope	0.00
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.00
DuB:						
Dunbridge	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.94	Too sandy	0.94	Too sandy	0.94
					Depth to bedrock	0.84
					Slope	0.13
EmA:						
Elliott	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
FbA:						
Flatrock	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Depth to saturated zone	1.00			Flooding	0.60
FcA:						
Flatrock	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Depth to saturated zone	1.00			Flooding	0.60
FdA:						
Flatrock, limestone substratum	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Depth to saturated zone	1.00			Flooding	0.60
FoA:						
Fox	Not limited		Not limited		Somewhat limited	
					Gravel content	0.22
FoB:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Gravel content	0.22

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoC2:						
Fox	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
					Gravel content	0.22
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
FtA:						
Fulton, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
GaB:						
Gallman	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Gravel content	0.06
GfA:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GmA:						
Glynwood, limestone substratum	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
GnB:						
Glynwood	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
GpB2:						
Glynwood	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
GpC2:						
Glynwood	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Slope	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.75	Restricted permeability	0.96
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.95
GsB:						
Glynwood	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.13
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.00
Houcktown	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
					Slope	0.13

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GuB:						
Glynwood----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
Urban Land----------	Not rated		Not rated		Not rated	
HaA:						
Harrod----------	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Depth to saturated zone	0.75	Flooding	1.00
	Depth to saturated zone	1.00	Flooding	0.40	Depth to saturated zone	0.95
HkA:						
Haskins----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
HnA:						
Haskins----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
HpA:						
Houcktown----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
HpB:						
Houcktown----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.43	Restricted permeability	0.43	Slope	0.50
					Restricted permeability	0.43
HrB:						
Houcktown----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
					Slope	0.13
Glynwood----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.13
Jenera----------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.13
HsA:						
Hoytville----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
HtA:						
Hoytville----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Too clayey	1.00	Too clayey	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JeA:						
Jenera	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
JeB:						
Jenera	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
JfB:						
Jenera	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.13
Shinrock, till substratum	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.13
JoA:						
Joliet	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
					Gravel content	0.04
KnA:						
Knoxdale	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
LbA:						
Lamberjack	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Gravel content	0.22
LcA:						
Lamberjack	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Gravel content	0.22
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
					Slope	0.50
LyE:						
Lybrand	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
MbA:						
Medway	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Depth to saturated zone	1.00			Flooding	0.60
					Gravel content	0.06
McA:						
Medway, limestone substratum	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Depth to saturated zone	1.00			Flooding	0.60
					Gravel content	0.06

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MeA:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
MfA:						
Mermill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
MgA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Gravel content	0.06
MnA:						
Milton	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MpD3:						
Morley	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
MrA:						
Morley, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
MsB:						
Morley, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Slope	0.50
					Restricted permeability	0.43
Milton	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.54
					Slope	0.50
					Restricted permeability	0.21
MvB:						
Mortimer	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
MwB2:						
Mortimer	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.50
NnA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NnB:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
NpA:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
NpB2:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
NrA:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Urban Land----------	Not rated		Not rated		Not rated	
OrA:						
Oshtemo----------	Not limited		Not limited		Somewhat limited	
					Gravel content	0.22
OrB:						
Oshtemo----------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Gravel content	0.22
OrC:						
Oshtemo----------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
					Gravel content	0.22
OsB:						
Oshtemo, till substratum---------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Gravel content	0.22
OwB:						
Ottokee----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.96	Too sandy	0.96	Too sandy	0.96
					Slope	0.13
PbA:						
Patton----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
PmA:						
Pewamo----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
PnA:						
Pewamo----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Urban Land----------	Not rated		Not rated		Not rated	

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
RgB:						
Rawson	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
					Slope	0.50
					Gravel content	0.06
RhA:						
Rensselaer, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RnA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Too sandy	0.70	Too sandy	0.70	Too sandy	0.70
RoA:						
Rimer, deep phase	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	0.85	Too sandy	0.85	Too sandy	0.85
RtA:						
Rossburg	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
SeA:						
Shawtown	Not limited		Not limited		Somewhat limited	
					Gravel content	0.06
SeB:						
Shawtown	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Gravel content	0.06
SfB:						
Shinrock	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.50
					Restricted permeability	0.21
SgC2:						
Shinrock	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to saturated zone	0.95
	Slope	0.04	Slope	0.04	Restricted permeability	0.21
SkB:						
Shinrock, till substratum	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.95
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.13
Glynwood	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Restricted permeability	0.96
	Restricted permeability	0.96	Depth to saturated zone	0.75	Depth to saturated zone	0.95
					Slope	0.13

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SmA:						
Shoals	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00			Flooding	0.60
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00			Flooding	0.60
SoA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00			Flooding	0.60
SpA:						
Sloan, limestone substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00			Flooding	0.60
StB2:						
St. Clair	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
StC2:						
St. Clair	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.04	Slope	0.04	Restricted permeability	0.96
ThA:						
Thackery, till substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.48	Depth to saturated zone	0.77
TkA:						
Tiderishi	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
TnA:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
ToB:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
	Depth to saturated zone	0.44	Depth to saturated zone	0.19	Depth to saturated zone	0.51
					Slope	0.50
TpA:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.19	Depth to saturated zone	0.51
TpB:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.19	Depth to saturated zone	0.51
					Slope	0.50

TABLE 16.--RECREATIONAL DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuB:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.19	Depth to saturated zone	0.51
					Slope	0.50
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
VeA:						
Vaughnsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Restricted permeability	0.43
					Gravel content	0.06
					Slope	0.00
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Rensselaer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
AkA:						
Alvada	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
AmA:						
Alvada	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
ApB:						
Arkport	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.79	Too sandy	0.79	Droughty	0.03
ArA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Not limited		Not limited		Very limited	
					Depth to bedrock	1.00
					Droughty	0.85
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.90
BgB:						
Biglick	Not limited		Not limited		Very limited	
					Depth to bedrock	1.00
					Droughty	0.94
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.80
BnA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BoA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BoB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BpA:						
Blount	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Houcktown	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
BrA:						
Blount	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Jenera	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
BuA:						
Blount	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Not limited		Not limited		Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.87 0.04 0.01
Biglick	Not limited		Not limited		Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.04
CoA:						
Colwood	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
CtA:						
Cygnet	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
CuA:						
Cygnet	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
DeA:						
Del Rey	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.94
DfA:						
Del Rey	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.94
Blount	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
DuB:						
Dunbridge	Somewhat limited Too sandy	0.94	Somewhat limited Too sandy	0.94	Somewhat limited Depth to bedrock Droughty	0.84 0.18

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EmA:						
Elliott	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
FbA:						
Flatrock	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Flooding	0.60
FcA:						
Flatrock	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Flooding	0.60
FdA:						
Flatrock, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Flooding	0.60
FoA:						
Fox	Not limited		Not limited		Not limited	
FoB:						
Fox	Not limited		Not limited		Not limited	
FoC2:						
Fox	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FtA:						
Fulton, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GaB:						
Gallman	Not limited		Not limited		Not limited	
GfA:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
GmA:						
Glynwood, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
GnB:						
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
GpB2:						
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
GpC2:						
Glynwood	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	0.04
GsB:						
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Houcktown	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GuB:						
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Urban Land	Not rated		Not rated		Not rated	
HaA:						
Harrod	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Flooding	1.00
	Flooding	0.40	Flooding	0.40	Depth to saturated zone	0.75
					Depth to bedrock	0.23
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HpA:						
Houcktown	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
HpB:						
Houcktown	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
HrB:						
Houcktown	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Jenera	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
HsA:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
HtA:						
Hoytville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
JeA:						
Jenera	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
JeB:						
Jenera	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
JfB:						
Jenera	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Shinrock, till substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
JoA:						
Joliet	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Depth to bedrock	1.00
					Droughty	0.01
KnA:						
Knoxdale	Not limited		Not limited		Somewhat limited	
					Flooding	0.60

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LbA:						
Lamberjack----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
LcA:						
Lamberjack----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land----------	Not rated		Not rated		Not rated	
LuB2:						
Lucas----------	Not limited		Not limited		Not limited	
LyE:						
Lybrand----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00				
MbA:						
Medway----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Flooding	0.60
McA:						
Medway, limestone substratum---------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Flooding	0.60
MeA:						
Mermill----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
MfA:						
Mermill----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
MgA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
					Depth to bedrock	0.10
MnA:						
Milton----------	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.54
MpD3:						
Morley----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.00				
MrA:						
Morley, limestone substratum---------	Not limited		Not limited		Not limited	
MsB:						
Morley, limestone substratum---------	Not limited		Not limited		Not limited	
Milton----------	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.54
MvB:						
Mortimer----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
MwB2:						
Mortimer----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
NnA:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NnB:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
NpA:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NpB2:						
Nappanee	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
NrA:						
Nappanee	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Not limited		Not limited		Not limited	
OrB:						
Oshtemo	Not limited		Not limited		Not limited	
OrC:						
Oshtemo	Not limited		Not limited		Somewhat limited Slope	0.04
OsB:						
Oshtemo, till substratum	Not limited		Not limited		Not limited	
OwB:						
Ottokee	Somewhat limited Too sandy	0.96	Somewhat limited Too sandy	0.96	Somewhat limited Droughty	0.12
PbA:						
Patton	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
PmA:						
Pewamo	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
PnA:						
Pewamo	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 0.84
RgB:						
Rawson	Not limited		Not limited		Not limited	
RhA:						
Rensselaer, till substratum	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
RnA:						
Rimer	Very limited Depth to saturated zone Too sandy	1.00 0.70	Very limited Depth to saturated zone Too sandy	1.00 0.70	Very limited Depth to saturated zone Droughty	1.00 0.01
RoA:						
Rimer, deep phase	Very limited Depth to saturated zone Too sandy	1.00 0.85	Very limited Depth to saturated zone Too sandy	1.00 0.85	Very limited Depth to saturated zone	1.00
RtA:						
Rossburg	Not limited		Not limited		Somewhat limited Flooding	0.60
SeA:						
Shawtown	Not limited		Not limited		Not limited	

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SeB:						
Shawtown	Not limited		Not limited		Not limited	
SfB:						
Shinrock	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
SgC2:						
Shinrock	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	0.04
SkB:						
Shinrock, till substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Glynwood	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
SmA:						
Shoals	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Flooding	0.60
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
					Flooding	0.60
SoA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
					Flooding	0.60
SpA:						
Sloan, limestone substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
					Flooding	0.60
StB2:						
St. Clair	Not limited		Not limited		Not limited	
StC2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
ThA:						
Thackery, till substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
TkA:						
Tiderishi	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
TnA:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
ToB:						
Tuscola	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.79	Too sandy	0.79	Depth to saturated zone	0.19
TpA:						
Tuscola	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
TpB:						
Tuscola	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19

TABLE 17.--RECREATIONAL DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuB:						
Tuscola	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.19
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
VeA:						
Vaughnsville	Not limited		Not limited		Not limited	
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Rensselaer	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00

TABLE 18.--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: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
AdA:												
Adrian	Very poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
AkA:												
Alvada	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
AmA:												
Alvada	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
AnA:												
Aquents	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
ApB:												
Arkport	Poor	Fair	Good	Good	Good	---	Poor	Very poor	Fair	Good	Very poor	---
ArA:												
Aurand	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
AsA:												
Aurand	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
BgA:												
Biglick	Poor	Poor	Fair	Poor	Poor	---	Poor	Very poor	Poor	Poor	Very poor	---
Milton	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
BgB:												
Biglick	Poor	Poor	Fair	Poor	Poor	---	Poor	Very poor	Poor	Poor	Very poor	---
Milton	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
BnA:												
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
BoA:												
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
BoB:												
Blount	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
BpA:												
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Houcktown	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
BrA:												
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Jenera	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
BuA:												
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
ChC:												
Channahon	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
Biglick	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
CoA:												
Colwood	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
CtA:												
Cygnet	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---

TABLE 18.--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	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
CuA:												
Cygnet	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
DbA:												
Darroch	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
DeA:												
Del Rey	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
DfA:												
Del Rey	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Blount	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
DuB:												
Dunbridge	Fair	Fair	Good	Fair	Fair	---	Poor	Very poor	Fair	Fair	Very poor	---
EmA:												
Elliott	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
FbA:												
Flatrock	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
FcA:												
Flatrock	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
FdA:												
Flatrock, limestone substratum	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
FoA:												
Fox	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
FoB:												
Fox	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
FoC2:												
Fox	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
FsA:												
Fulton	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
FtA:												
Fulton, till substratum	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
GaB:												
Gallman	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
GfA:												
Gilford	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Fair	Poor	Good	---
GmA:												
Glynwood, limestone substratum	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
GnB:												
Glynwood	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
GpB2:												
Glynwood	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
GpC2:												
Glynwood	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
GsB:												
Glynwood	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Blount	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Houcktown	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---

TABLE 18.--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	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
GuB:												
Glynwood	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
HaA:												
Harrod	Fair	Good	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor	---
HkA:												
Haskins	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
HnA:												
Haskins	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
HpA:												
Houcktown	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
HpB:												
Houcktown	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
HrB:												
Houcktown	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Glynwood	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Jenera	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
HsA:												
Hoytville	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
HtA:												
Hoytville	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
JeA:												
Jenera	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
JeB:												
Jenera	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
JfB:												
Jenera	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Shinrock, till substratum	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
JoA:												
Joliet	Poor	Poor	Fair	Fair	Fair	---	Good	Poor	Poor	Fair	Fair	---
KnA:												
Knoxdale	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
LbA:												
Lamberjack	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
LcA:												
Lamberjack	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
LuB2:												
Lucas	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
LyE:												
Lybrand	Very poor	Poor	Good	Good	Good	---	Very poor	Very poor	Poor	Good	Very poor	---
MbA:												
Medway	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
McA:												
Medway, limestone substratum	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
MeA:												
Mermill	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
MfA:												
Mermill	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---

TABLE 18.--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	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
MgA:												
Millsdale	Poor	Poor	Poor	Poor	Poor	---	Good	Fair	Poor	Poor	Fair	---
MnA:												
Milton	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MpD3:												
Morley	Poor	Fair	Good	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
MrA:												
Morley, limestone substratum	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MsB:												
Morley, limestone substratum	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
Milton	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MvB:												
Mortimer	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
MwB2:												
Mortimer	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
NnA:												
Nappanee	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
NnB:												
Nappanee	Fair	Good	Good	Good	Good	---	Fair	Poor	Good	Good	Poor	---
NpA:												
Nappanee	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
NpB2:												
Nappanee	Fair	Good	Good	Good	Good	---	Fair	Poor	Good	Good	Poor	---
NrA:												
Nappanee	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
OrA:												
Oshtemo	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
OrB:												
Oshtemo	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
OrC:												
Oshtemo	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
OsB:												
Oshtemo, till substratum	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
OwB:												
Ottokee	Poor	Fair	Good	Good	Good	---	Poor	Very poor	Fair	Good	Very poor	---
PbA:												
Patton	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
PmA:												
Pewamo	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
PnA:												
Pewamo	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
Pt:												
Pits	---	---	---	---	---	---	---	---	---	---	---	---
RcA:												
Randolph	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---

TABLE 18.--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	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
RgB:												
Rawson	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
RhA:												
Rensselaer, till substratum	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
RnA:												
Rimer	Poor	Fair	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
RoA:												
Rimer, deep phase	Poor	Fair	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
RtA:												
Rossburg	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
SeA:												
Shawtown	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
SeB:												
Shawtown	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
SfB:												
Shinrock	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
SgC2:												
Shinrock	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
SkB:												
Shinrock, till substratum	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Glynwood	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
SmA:												
Shoals	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
SnA:												
Sloan	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
SoA:												
Sloan	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
SpA:												
Sloan, limestone substratum	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
StB2:												
St. Clair	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
StC2:												
St. Clair	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
ThA:												
Thackery, till substratum	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
TkA:												
Tiderishi	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
TnA:												
Toledo	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
ToB:												
Tuscola	Fair	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
TpA:												
Tuscola	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
TpB:												
Tuscola	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---

TABLE 18.--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	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
TuB:												
Tuscola	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
UcA:												
Udorthents	---	---	---	---	---	---	---	---	---	---	---	---
UcD:												
Udorthents	---	---	---	---	---	---	---	---	---	---	---	---
Ur:												
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
VaA:												
Vanlue	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
VeA:												
Vaughnsville	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
W:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
WeA:												
Westland	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
Rensselaer	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---

TABLE 19.--CONSTRUCTION MATERIALS-Part-1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AdA:					
Adrian	100	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.98
AkA:					
Alvada	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AmA:					
Alvada	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	25	Not rated		Not rated	
AnA:					
Aquents	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ApB:					
Arkport	90	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.94
		Thickest layer	0.00		
ArA:					
Aurand	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AsA:					
Aurand	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	35	Not rated		Not rated	
BgA:					
Biglick	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Milton	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BgB:					
Biglick	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Milton	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BnA:					
Blount	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BoA:					
Blount	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BoB:					
Blount	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
BpA:					
Blount	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Houcktown	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BrA:					
Blount	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jenera	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BuA:					
Blount	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	40	Not rated		Not rated	
ChC:					
Channahon	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Biglick	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CoA:					
Colwood	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CtA:					
Cygnet	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.41
CuA:					
Cygnet	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	40	Not rated		Not rated	
DbA:					
Darroch	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DeA:					
Del Rey	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DfA:					
Del Rey	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Blount	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DuB:					
Dunbridge	100	Fair		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.15	Thickest layer	0.00
EmA:					
Elliott	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
FbA:					
Flatrock	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FcA:					
Flatrock	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FdA:					
Flatrock, limestone substratum	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FoA:					
Fox	90	Fair		Fair	
		Thickest layer	0.23	Thickest layer	0.00
		Bottom layer	0.68	Bottom layer	0.23
FoB:					
Fox	90	Fair		Fair	
		Thickest layer	0.23	Thickest layer	0.00
		Bottom layer	0.68	Bottom layer	0.23
FoC2:					
Fox	100	Fair		Fair	
		Thickest layer	0.23	Thickest layer	0.00
		Bottom layer	0.68	Bottom layer	0.23
FsA:					
Fulton	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FtA:					
Fulton, till substratum	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaB:					
Gallman	90	Fair		Fair	
		Thickest layer	0.08	Thickest layer	0.00
		Bottom layer	0.60	Bottom layer	0.09
GfA:					
Gilford	90	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.99
GmA:					
Glynwood, limestone substratum	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GnB:					
Glynwood	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GpB2:					
Glynwood	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GpC2:					
Glynwood	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Potential source of gravel: Value	Potential source of sand: Rating class	Potential source of sand: Value
GsB:					
Glynwood	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Blount	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Houcktown	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GuB:					
Glynwood	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	35	Not rated		Not rated	
HaA:					
Harrod	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HkA:					
Haskins	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HnA:					
Haskins	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HpA:					
Houcktown	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HpB:					
Houcktown	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HrB:					
Houcktown	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Glynwood	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jenera	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HsA:					
Hoytville	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HtA:					
Hoytville	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JeA:					
Jenera	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JeB:					
Jenera	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
JfB:					
Jenera	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shinrock, till substratum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JoA:					
Joliet	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KnA:					
Knoxdale	90	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
LbA:					
Lamberjack	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LcA:					
Lamberjack	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	35	Not rated		Not rated	
LuB2:					
Lucas	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LyE:					
Lybrand	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MbA:					
Medway	90	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.23	Bottom layer	0.10
McA:					
Medway, limestone substratum	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MeA:					
Mermill	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MfA:					
Mermill	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MgA:					
Millsdale	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MnA:					
Milton	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MpD3:					
Morley	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
MrA:					
Morley, limestone substratum	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsB:					
Morley, limestone substratum	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Milton	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MvB:					
Mortimer	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MwB2:					
Mortimer	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NnA:					
Nappanee	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NnB:					
Nappanee	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NpA:					
Nappanee	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NpB2:					
Nappanee	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NrA:					
Nappanee	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	40	Not rated		Not rated	
OrA:					
Oshtemo	85	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.09
		Bottom layer	0.60	Bottom layer	0.90
OrB:					
Oshtemo	93	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.08
		Bottom layer	0.60	Bottom layer	0.90
OrC:					
Oshtemo	95	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.09
		Bottom layer	0.60	Bottom layer	0.90
OsB:					
Oshtemo, till substratum	92	Fair		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.60	Thickest layer	0.30
OwB:					
Ottokee	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.19
		Thickest layer	0.00	Thickest layer	0.65

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
PbA:					
Patton	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PmA:					
Pewamo	94	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PnA:					
Pewamo	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban Land	30	Not rated		Not rated	
Pt:					
Pits	90	Not rated		Not rated	
RcA:					
Randolph	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RgB:					
Rawson	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
RhA:					
Rensselaer, till substratum	88	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RnA:					
Rimer	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RoA:					
Rimer, deep phase	95	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.09
RtA:					
Rossburg	85	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
SeA:					
Shawtown	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SeB:					
Shawtown	91	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SfB:					
Shinrock	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SgC2:					
Shinrock	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
SkB:					
Shinrock, till substratum---------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Glynwood----------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmA:					
Shoals----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SnA:					
Sloan----------	90	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
SoA:					
Sloan----------	90	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
SpA:					
Sloan, limestone substratum---------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
StB2:					
St. Clair----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
StC2:					
St. Clair----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ThA:					
Thackery, till substratum---------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TkA:					
Tiderishi----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TnA:					
Toledo----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ToB:					
Tuscola----------	93	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
TpA:					
Tuscola----------	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TpB:					
Tuscola----------	93	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TuB:					
Tuscola----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
UcA:					
Udorthents----------	75	Not rated		Not rated	

TABLE 19.--CONSTRUCTION MATERIALS-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
UcD:					
Udorthents----------	85	Not rated		Not rated	
Ur:					
Urban Land----------	88	Not rated		Not rated	
VaA:					
Vanlue----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VeA:					
Vaughnsville--------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water----------	100	Not rated		Not rated	
WeA:					
Westland----------	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.77	Bottom layer	0.39
Rensselaer----------	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06

TABLE 20.--CONSTRUCTION MATERIALS-Part-2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AdA:							
Adrian	100	Poor		Poor		Poor	
		Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.50			Content of organic matter	0.00
		Carbonate content	0.92				
AkA:							
Alvada	80	Fair		Poor		Poor	
		Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Low strength	0.00		
AmA:							
Alvada	50	Fair		Poor		Poor	
		Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
Urban Land	25	Not rated		Not rated		Not rated	
AnA:							
Aquents	90	Fair		Poor		Poor	
		Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.50	Low strength	0.00	Too Clayey	0.01
		Carbonate content	0.80	Shrink-swell	0.87		
		No water erosion limitation	0.99				
ApB:							
Arkport	90	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00				
		Low content of organic matter	0.50				
		Too acid	0.88				
ArA:							
Aurand	90	Fair		Poor		Poor	
		Carbonate content	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.00
AsA:							
Aurand	50	Fair		Poor		Poor	
		Carbonate content	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.00
Urban Land	35	Not rated		Not rated		Not rated	
BgA:							
Biglick	70	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Low strength	0.00		
				Shrink-swell	0.87		
Milton	25	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Depth to bedrock	0.10	Depth to bedrock	0.00	Depth to bedrock	0.10
		Droughty	0.30	Shrink-swell	0.87		
		Too acid	0.97				
		No water erosion limitation	0.99				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
BgB:							
Biglick	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Low strength	0.00		
				Shrink-swell	0.87		
Milton	40	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Depth to bedrock	0.21	Depth to bedrock	0.00	Depth to bedrock	0.21
		Droughty	0.42	Shrink-swell	0.87		
		Low content of organic matter	0.88				
		Too acid	0.97				
BnA:							
Blount	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.97
		Too acid	0.68				
		Water erosion	0.90				
BoA:							
Blount	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Hard to reclaim	0.01
		Too clayey	0.59	Shrink-swell	0.87	Too Clayey	0.35
		Too acid	0.68			Rock fragments	0.88
		Water erosion	0.90				
BoB:							
Blount	95	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.54
		Too acid	0.68				
		Water erosion	0.90				
BpA:							
Blount	60	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.65
		Too acid	0.68				
		Water erosion	0.90				
Houcktown	35	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.14
		Carbonate content	0.68	Depth to saturated zone	0.14	Hard to reclaim	0.35
		No water erosion limitation	0.99	Shrink-swell	0.99	Rock fragments	0.50
BrA:							
Blount	55	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.46	Shrink-swell	0.87	Hard to reclaim	0.20
		Too acid	0.68				
		Water erosion	0.90				
Jenera	40	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Low strength	0.22		
		No water erosion limitation	0.99				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
BuA:							
Blount	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.35
		Too acid	0.68				
		Water erosion	0.90				
Urban Land	40	Not rated		Not rated		Not rated	
ChC:							
Channahon	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.87	Slope	0.96
						Rock fragments	0.97
Biglick	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Low strength	0.00	Slope	0.96
				Shrink-swell	0.87		
CoA:							
Colwood	80	Fair		Poor		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Low strength	0.22		
CtA:							
Cygnet	90	Fair		Fair		Fair	
		Carbonate content	0.46	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88			Rock fragments	0.28
CuA:							
Cygnet	50	Fair		Fair		Fair	
		Carbonate content	0.46	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88			Rock fragments	0.28
Urban Land	40	Not rated		Not rated		Not rated	
DbA:							
Darroch	90	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88				
		No water erosion limitation	0.99				
DeA:							
Del Rey	85	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Carbonate content	0.80	Shrink-swell	0.87		
		Too acid	0.88				
		Water erosion	0.90				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
DfA:							
Del Rey	55	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Low content of organic matter	0.50	Depth to saturated zone	0.04	Depth to saturated zone	0.04
		Carbonate content	0.80	Shrink-swell	0.87		
		Too acid	0.88				
		Water erosion	0.90				
Blount	40	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.29
		Too acid	0.68				
		Water erosion	0.90				
DuB:							
Dunbridge	100	Poor		Poor		Fair	
		Wind erosion	0.00	Depth to bedrock	0.00	Rock fragments	0.03
		Droughty	0.04			Depth to bedrock	0.16
		Depth to bedrock	0.16				
		Low content of organic matter	0.88				
EmA:							
Elliott	90	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Low content of organic matter	0.50	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Carbonate content	0.68	Shrink-swell	0.91	Hard to reclaim	0.94
FbA:							
Flatrock	95	Fair		Fair		Fair	
		Low content of organic matter	0.88	Depth to saturated zone	0.14	Depth to saturated zone	0.14
						Hard to reclaim	0.82
FcA:							
Flatrock	90	Fair		Poor		Fair	
		Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.14
		No water erosion limitation	0.99	Depth to saturated zone	0.14		
FdA:							
Flatrock, limestone substratum	95	Fair		Poor		Fair	
		Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.14
		No water erosion limitation	0.99	Depth to saturated zone	0.14		
FoA:							
Fox	90	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.28
		Carbonate content	0.68			Hard to reclaim	0.82
		Too acid	0.97				
		No water erosion limitation	0.99				
FoB:							
Fox	90	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.28
		Carbonate content	0.68			Hard to reclaim	0.82
		Too acid	0.97				
		No water erosion limitation	0.99				
FoC2:							
Fox	100	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.28
		Carbonate content	0.68			Hard to reclaim	0.82
		Too acid	0.97			Slope	0.96
		No water erosion limitation	0.99				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
FsA:							
Fulton	80	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.92	Shrink-swell	0.87		
		Too acid	0.97				
		No water erosion limitation	0.99				
FtA:							
Fulton, till substratum	95	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.68	Shrink-swell	0.87		
		Too acid	0.97				
		No water erosion limitation	0.99				
GaB:							
Gallman	90	Fair		Good		Fair	
		Low content of organic matter	0.50			Rock fragments	0.12
		Too acid	0.88				
GfA:							
Gilford	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
GmA:							
Glynwood, limestone substratum	100	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.61
		Water erosion	0.90				
		Too acid	0.97				
GnB:							
Glynwood	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.97
		Too acid	0.88				
		Water erosion	0.90				
GpB2:							
Glynwood	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.65
		Too acid	0.88				
		Water erosion	0.90				
GpC2:							
Glynwood	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.71
		Water erosion	0.90			Slope	0.96
		Too acid	0.97				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
GsB:							
Glynwood	40	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.94
		Too acid	0.88				
		Water erosion	0.90				
Blount	35	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.87	Hard to reclaim	0.71
		Too acid	0.68				
		Water erosion	0.90				
Houcktown	15	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		No water erosion limitation	0.99			Rock fragments	0.50
						Hard to reclaim	0.97
GuB:							
Glynwood	55	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.94
		Too acid	0.88				
		Water erosion	0.90				
Urban Land	35	Not rated		Not rated		Not rated	
HaA:							
Harrod	90	Fair		Poor		Fair	
		Depth to bedrock	0.77	Depth to bedrock	0.00	Depth to saturated zone	0.14
				Depth to saturated zone	0.14	Depth to bedrock	0.77
				Low strength	0.22	Rock fragments	0.97
HkA:							
Haskins	95	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.74			Rock fragments	0.88
		Too acid	0.88			Hard to reclaim	0.97
HnA:							
Haskins	95	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.74			Rock fragments	0.88
		Too acid	0.88			Hard to reclaim	0.94
		No water erosion limitation	0.99				
HpA:							
Houcktown	95	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		No water erosion limitation	0.99			Rock fragments	0.50
						Hard to reclaim	0.90
HpB:							
Houcktown	90	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		No water erosion limitation	0.99			Rock fragments	0.50
						Hard to reclaim	0.54

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
HrB:							
Houcktown----------	40	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Hard to reclaim	0.01
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Too clayey	0.92	Shrink-swell	0.98	Too Clayey	0.53
		Droughty	0.94				
		No water erosion limitation	0.99				
Glynwood----------	30	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.94
		Too acid	0.88				
		Water erosion	0.90				
Jenera----------	25	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Low strength	0.78		
HsA:							
Hoytville----------	95	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.88	Shrink-swell	0.87		
HtA:							
Hoytville----------	95	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Carbonate content	0.80	Low strength	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.88	Shrink-swell	0.87		
JeA:							
Jenera----------	85	Fair		Poor		Fair	
		Carbonate content	0.68	Low strength	0.00	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Depth to saturated zone	0.14		
		No water erosion limitation	0.99				
JeB:							
Jenera----------	95	Fair		Fair		Fair	
		Carbonate content	0.68	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Low strength	0.78		
JfB:							
Jenera----------	55	Fair		Poor		Fair	
		Carbonate content	0.68	Low strength	0.00	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Depth to saturated zone	0.14		
		No water erosion limitation	0.99				
Shinrock, till substratum---------	35	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Carbonate content	0.54				
		Too acid	0.97				
		No water erosion limitation	0.99				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
JoA:							
Joliet	95	Poor		Poor		Poor	
		Depth to bedrock	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
		Droughty	0.17	Depth to saturated zone	0.00	Depth to bedrock	0.00
						Rock fragments	0.97
KnA:							
Knoxdale	90	Fair		Poor		Good	
		Low content of organic matter	0.88	Low strength	0.00		
		No water erosion limitation	0.99				
LbA:							
Lamberjack	85	Fair		Poor		Poor	
		Carbonate content	0.68	Depth to saturated zone	0.00	Hard to reclaim	0.00
						Depth to saturated zone	0.00
						Rock fragments	0.88
LcA:							
Lamberjack	40	Fair		Poor		Poor	
		Carbonate content	0.68	Depth to saturated zone	0.00	Hard to reclaim	0.00
						Depth to saturated zone	0.00
						Rock fragments	0.88
Urban Land	35	Not rated		Not rated		Not rated	
LuB2:							
Lucas	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Depth to saturated zone	0.98
		Carbonate content	0.92	Depth to saturated zone	0.98		
		Too acid	0.97				
		No water erosion limitation	0.99				
LyE:							
Lybrand	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Carbonate content	0.46	Slope	0.00	Too Clayey	0.00
		Water erosion	0.90	Shrink-swell	0.87	Hard to reclaim	0.42
		Too acid	0.97				
MbA:							
Medway	90	Fair		Fair		Fair	
		Low content of organic matter	0.88	Depth to saturated zone	0.14	Depth to saturated zone	0.14
				Low strength	0.22	Rock fragments	0.97
McA:							
Medway, limestone substratum	90	Fair		Fair		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.14	Hard to reclaim	0.00
				Low strength	0.22	Depth to saturated zone	0.14
						Rock fragments	0.97
MeA:							
Mermill	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Low strength	0.00		
				Shrink-swell	0.99		

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MfA:							
Mermill	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Low strength	0.00		
		No water erosion limitation	0.99	Shrink-swell	0.99		
MgA:							
Millsdale	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Depth to bedrock	0.90	Low strength	0.00	Too Clayey	0.00
		Droughty	0.99	Depth to bedrock	0.00	Depth to bedrock	0.90
				Shrink-swell	0.87	Rock fragments	0.97
MnA:							
Milton	90	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Depth to bedrock	0.46	Depth to bedrock	0.00	Depth to bedrock	0.46
		Droughty	0.76	Shrink-swell	0.87		
		Low content of organic matter	0.88				
		Too acid	0.97				
MpD3:							
Morley	90	Fair		Poor		Poor	
		Carbonate content	0.68	Low strength	0.00	Hard to reclaim	0.00
		Too clayey	0.76	Shrink-swell	0.87	Slope	0.00
		Droughty	0.78	Depth to saturated zone	0.98	Too Clayey	0.54
		Low content of organic matter	0.88			Rock fragments	0.97
		Too acid	0.88			Depth to saturated zone	0.98
MrA:							
Morley, limestone substratum	95	Fair		Poor		Fair	
		Too clayey	0.05	Low strength	0.00	Too Clayey	0.03
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.10
		Too acid	0.88	Depth to saturated zone	0.98	Rock fragments	0.97
		Carbonate content	0.92			Depth to saturated zone	0.98
		No water erosion limitation	0.99				
MsB:							
Morley, limestone substratum	60	Fair		Poor		Fair	
		Too clayey	0.05	Low strength	0.00	Too Clayey	0.03
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.84
		Too acid	0.88	Depth to saturated zone	0.98	Rock fragments	0.97
		Carbonate content	0.92			Depth to saturated zone	0.98
		No water erosion limitation	0.99				
Milton	30	Fair		Poor		Fair	
		Too clayey	0.02	Low strength	0.00	Too Clayey	0.01
		Depth to bedrock	0.46	Depth to bedrock	0.00	Depth to bedrock	0.46
		Droughty	0.73	Shrink-swell	0.87		
		Low content of organic matter	0.88				
		Too acid	0.97				
MvB:							
Mortimer	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.80	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87		
		Too acid	0.97				
		No water erosion limitation	0.99				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MwB2:							
Mortimer	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.80	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87		
		Too acid	0.97				
		No water erosion limitation	0.99				
NnA:							
Nappanee	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Shrink-swell	0.87	Hard to reclaim	0.84
		Too acid	0.97				
		No water erosion limitation	0.99				
NnB:							
Nappanee	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Shrink-swell	0.87	Hard to reclaim	0.65
		Too acid	0.97				
		Droughty	0.98				
NpA:							
Nappanee	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Shrink-swell	0.87		
		Water erosion	0.90				
		Too acid	0.97				
NpB2:							
Nappanee	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Low strength	0.00	Depth to saturated zone	0.00
		Droughty	0.76	Shrink-swell	0.87	Hard to reclaim	0.71
		Carbonate content	0.84				
		Water erosion	0.90				
NrA:							
Nappanee	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.50	Low strength	0.00	Depth to saturated zone	0.00
		Carbonate content	0.84	Shrink-swell	0.87	Hard to reclaim	0.84
		Too acid	0.97				
		No water erosion limitation	0.99				
Urban Land	40	Not rated		Not rated		Not rated	
OrA:							
Oshtemo	85	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.12
		Too acid	0.84			Hard to reclaim	0.98
		Carbonate content	0.97				
OrB:							
Oshtemo	93	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.12
		Too acid	0.84			Hard to reclaim	0.98
		Carbonate content	0.97				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
OrC:							
Oshtemo	95	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.12
		Too acid	0.84			Slope	0.96
		Carbonate content	0.97			Hard to reclaim	0.98
OsB:							
Oshtemo, till substratum	92	Fair		Good		Fair	
		Low content of organic matter	0.12			Rock fragments	0.12
		Carbonate content	0.74			Hard to reclaim	0.98
		Too acid	0.84				
OwB:							
Ottokee	80	Poor		Fair		Poor	
		Wind erosion	0.00	Depth to saturated zone	0.98	Too sandy	0.00
		Too sandy	0.00			Depth to saturated zone	0.98
		Low content of organic matter	0.50				
PbA:							
Patton	85	Fair		Poor		Poor	
		Water erosion	0.90	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too clayey	0.98	Low strength	0.00	Too Clayey	0.93
		Carbonate content	0.99	Shrink-swell	0.87		
PmA:							
Pewamo	94	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.80	Low strength	0.00	Too Clayey	0.00
				Shrink-swell	0.87		
PnA:							
Pewamo	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.80	Low strength	0.00	Too Clayey	0.00
				Shrink-swell	0.87		
Urban Land	30	Not rated		Not rated		Not rated	
Pt:							
Pits	90	Not rated		Not rated		Not rated	
RcA:							
Randolph	93	Fair		Poor		Poor	
		Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.12	Low strength	0.00	Too Clayey	0.01
		Depth to bedrock	0.16	Depth to bedrock	0.00	Depth to bedrock	0.16
		Droughty	0.44	Shrink-swell	0.91	Rock fragments	0.97
		Too acid	0.97				
RgB:							
Rawson	95	Fair		Fair		Fair	
		Carbonate content	0.74	Depth to saturated zone	0.98	Hard to reclaim	0.94
		Droughty	0.80			Rock fragments	0.97
		Too acid	0.88			Depth to saturated zone	0.98
RhA:							
Rensselaer, till substratum	88	Fair		Poor		Poor	
		Carbonate content	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		No water erosion limitation	0.99	Low strength	0.00		
				Shrink-swell	0.94		

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RnA:							
Rimer	95	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
		Too sandy	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Droughty	0.81				
		Carbonate content	0.92				
RoA:							
Rimer, deep phase	95	Poor		Poor		Poor	
		Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.88	Depth to saturated zone	0.00		
		Carbonate content	0.92				
		Too acid	0.97				
RtA:							
Rossburg	85	Fair		Fair		Good	
		Carbonate content	0.92	Low strength	0.78		
		No water erosion limitation	0.99				
SeA:							
Shawtown	85	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.98	Rock fragments	0.28
		Carbonate content	0.80			Depth to saturated zone	0.98
SeB:							
Shawtown	91	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.98	Rock fragments	0.28
		Carbonate content	0.80			Depth to saturated zone	0.98
SfB:							
Shinrock	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.88	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Too acid	0.97				
		Carbonate content	0.99				
		No water erosion limitation	0.99				
SgC2:							
Shinrock	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.88	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Too acid	0.97			Slope	0.96
		Carbonate content	0.99				
		No water erosion limitation	0.99				
SkB:							
Shinrock, till substratum	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Carbonate content	0.39				
		Too acid	0.97				
		No water erosion limitation	0.99				
Glynwood	40	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Carbonate content	0.39	Depth to saturated zone	0.14	Depth to saturated zone	0.14
		Low content of organic matter	0.88	Shrink-swell	0.87	Hard to reclaim	0.20
		Too acid	0.88				
		Water erosion	0.90				

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SmA:							
Shoals	95	Good		Poor		Poor	
				Low strength	0.00	Depth to saturated zone	0.00
				Depth to saturated zone	0.00		
				Shrink-swell	0.89		
SnA:							
Sloan	90	Fair		Poor		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.92	Low strength	0.00		
				Shrink-swell	0.98		
SoA:							
Sloan	90	Fair		Poor		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.92	Low strength	0.00		
				Shrink-swell	0.89		
SpA:							
Sloan, limestone substratum	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.92	Shrink-swell	0.99		
StB2:							
St. Clair	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Depth to saturated zone	0.89
		Carbonate content	0.84	Depth to saturated zone	0.89	Hard to reclaim	0.97
		Water erosion	0.90				
StC2:							
St. Clair	95	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87	Depth to saturated zone	0.89
		Carbonate content	0.84	Depth to saturated zone	0.89	Hard to reclaim	0.90
		Water erosion	0.90			Slope	0.96
		Droughty	0.97				
ThA:							
Thackery, till substratum	80	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.29	Depth to saturated zone	0.29
		Carbonate content	0.46	Low strength	0.78		
		Too acid	0.97	Shrink-swell	0.99		
		No water erosion limitation	0.99				
TkA:							
Tiderishi	85	Fair		Poor		Poor	
		Carbonate content	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.88				
		Too acid	0.97				
TnA:							
Toledo	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
		Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.87		
ToB:							
Tuscola	93	Poor		Poor		Fair	
		Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.53
		Low content of organic matter	0.12	Depth to saturated zone	0.53		

TABLE 20.--CONSTRUCTION MATERIALS-Part-2--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
TpA:							
Tuscola	93	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to saturated zone	0.53
TpB:							
Tuscola	93	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to saturated zone	0.53
TuB:							
Tuscola	95	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Depth to saturated zone	0.53
UcA:							
Udorthents	75	Not rated		Not rated		Not rated	
UcD:							
Udorthents	85	Not rated		Not rated		Not rated	
Ur:							
Urban Land	88	Not rated		Not rated		Not rated	
VaA:							
Vanlue	90	Fair		Poor		Poor	
		Carbonate content	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Low content of organic matter	0.88	Low strength	0.22		
		No water erosion limitation	0.99				
VeA:							
Vaughnsville	100	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.98	Rock fragments	0.72
		Carbonate content	0.80			Depth to saturated zone	0.98
W:							
Water	100	Not rated		Not rated		Not rated	
WeA:							
Westland	50	Fair		Poor		Poor	
		Carbonate content	0.08	Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Low strength	0.22	Hard to reclaim	0.08
				Shrink-swell	0.94	Rock fragments	0.97
Rensselaer	40	Fair		Poor		Poor	
		Low content of organic matter	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		No water erosion limitation	0.99	Shrink-swell	0.96		

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Content of organic matter	1.00	Depth to saturated zone	1.00	Content of organic matter	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
AkA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
AmA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
ApB:						
Arkport	Not limited		Not limited		Not limited	
ArA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.90	Depth to bedrock	1.00	Depth to bedrock	0.90
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BgB:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.79	Depth to bedrock	1.00	Depth to bedrock	0.79
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BnA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
BoA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BoB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BpA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Houcktown	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
			Shrink-swell	0.50		
BrA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Jenera	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
BuA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
Channahon	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
CoA:						
Colwood	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CtA:						
Cygnet	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
CuA:						
Cygnet	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
DfA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DuB:						
Dunbridge	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.84	Depth to bedrock	1.00	Depth to bedrock	0.84
EmA:						
Elliott	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FbA:						
Flatrock	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
FcA:						
Flatrock	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
FdA:						
Flatrock, limestone substratum	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
FoA:						
Fox	Not limited		Not limited		Not limited	
FoB:						
Fox	Not limited		Not limited		Not limited	
FoC2:						
Fox	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FtA:						
Fulton, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GaB:						
Gallman	Not limited		Not limited		Not limited	
GfA:						
Gilford	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GmA:						
Glynwood, limestone substratum	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
GnB:						
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GpB2:						
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GpC2:						
Glynwood	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.95
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
GsB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Houcktown	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
GuB:						
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Urban Land	Not rated		Not rated		Not rated	
HaA:						
Harrod	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Depth to bedrock	0.23	Depth to bedrock	1.00	Depth to bedrock	0.23
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HpA:						
Houcktown	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
HpB:						
Houcktown	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
			Shrink-swell	0.50		

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
HrB:						
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Houcktown	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Jenera	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
HsA:						
Hoytville	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
HtA:						
Hoytville	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
JeA:						
Jenera	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
JeB:						
Jenera	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
JfB:						
Jenera	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
Shinrock, till substratum	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
JoA:						
Joliet	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
KnA:						
Knoxdale	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.24		
LbA:						
Lamberjack	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
LcA:						
Lamberjack	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LyE:						
Lybrand	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.53	Shrink-swell	0.50
			Shrink-swell	0.50		
MbA:						
Medway	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
McA:						
Medway, limestone substratum	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
MeA:						
Mermill	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
MfA:						
Mermill	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
MgA:						
Millsdale	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Depth to bedrock	1.00	Shrink-swell	0.50
	Depth to bedrock	0.10	Shrink-swell	0.50	Depth to bedrock	0.10
MnA:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.54	Depth to bedrock	1.00	Depth to bedrock	0.54
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
MpD3:						
Morley	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
MrA:						
Morley, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
MsB:						
Milton	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.54	Depth to bedrock	1.00	Depth to bedrock	0.54
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Morley, limestone substratum	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
MvB:						
Mortimer	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MwB2:						
Mortimer	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NnA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NnB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NpA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NpB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NrA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Not limited		Not limited		Not limited	
OrB:						
Oshtemo	Not limited		Not limited		Not limited	
OrC:						
Oshtemo	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
OsB:						
Oshtemo, till substratum	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.24		
OwB:						
Ottokee	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
PbA:						
Patton	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
PmA:						
Pewamo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
PnA:						
Pewamo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	0.84	Depth to bedrock	1.00	Depth to bedrock	0.84
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RgB:						
Rawson	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
RhA:						
Rensselaer, till substratum	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RnA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Shrink-swell	0.50		
RoA:						
Rimer, deep phase	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
RtA:						
Rossburg	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
SeA:						
Shawtown	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
SeB:						
Shawtown	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
SfB:						
Shinrock	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SgC2:						
Shinrock	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Depth to saturated zone	0.95
	Slope	0.04	Slope	0.04	Shrink-swell	0.50

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
SkB:						
Glynwood	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Shinrock, till substratum	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Shrink-swell	0.50			Shrink-swell	0.50
SmA:						
Shoals	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SoA:						
Sloan	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SpA:						
Sloan, limestone substratum	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
StB2:						
St. Clair	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50		
StC2:						
St. Clair	Somewhat limited		Very limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Shrink-swell	0.50	Shrink-swell	0.50
			Slope	0.04		
ThA:						
Thackery, till substratum	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
			Shrink-swell	0.50		
TkA:						
Tiderishi	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
TnA:						
Toledo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
ToB:						
Tuscola	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.51	Depth to saturated zone	1.00	Depth to saturated zone	0.51

TABLE 21.--BUILDING SITE DEVELOPMENT-Part-1--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TpA:						
Tuscola	Somewhat limited Depth to saturated zone	0.51	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.51
TpB:						
Tuscola	Somewhat limited Depth to saturated zone	0.51	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.51
TuB:						
Tuscola	Somewhat limited Depth to saturated zone	0.51	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.51
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
VeA:						
Vaughnsville	Not limited		Somewhat limited Depth to saturated zone	0.99	Not limited	
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Rensselaer	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Westland	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Content of organic matter	1.00		
AkA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	0.20				
AmA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	0.20				
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
ApB:						
Arkport	Very limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.03
ArA:						
Aurand	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Too clayey	0.28	Droughty	0.85
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	0.90
	Depth to bedrock	0.90	Too clayey	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BgB:						
Biglick	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Too clayey	0.28	Droughty	0.94
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	0.80
	Depth to bedrock	0.79	Too clayey	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				
BnA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
BoA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
BoB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
BpA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
Houcktown	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
BrA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
Jenera	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.40	Cutbanks cave	0.10		
BuA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
Urban Land	Not rated		Not rated		Not rated	

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChC:						
Channahon	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.87
	Frost action	0.50	Slope	0.04	Slope	0.04
	Slope	0.04			Content of large stones	0.01
	Low strength	0.03				
Biglick	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Too clayey	0.28	Droughty	1.00
	Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.04
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
CoA:						
Colwood	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	0.40				
CtA:						
Cygnet	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Cutbanks cave	1.00		
	Low strength	0.04	Depth to dense layer	0.50		
CuA:						
Cygnet	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Cutbanks cave	1.00		
	Low strength	0.04	Depth to dense layer	0.50		
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Low strength	0.05				
DeA:						
Del Rey	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Low strength	1.00	Cutbanks cave	0.10		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
DfA:						
Del Rey	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Low strength	1.00	Cutbanks cave	0.10		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
DuB:						
Dunbridge	Very limited		Very limited		Somewhat limited	
	Depth to bedrock	0.84	Depth to bedrock	1.00	Depth to bedrock	0.84
	Frost action	0.50	Cutbanks cave	0.10	Droughty	0.18
	Low strength	0.03				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
EmA:						
Elliott	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Shrink-swell	0.50				
FbA:						
Flatrock	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
	Low strength	0.80	Flooding	0.60		
	Depth to saturated zone	0.75				
FcA:						
Flatrock	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Low strength	0.80	Cutbanks cave	0.10		
	Depth to saturated zone	0.75				
FdA:						
Flatrock, limestone substratum	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Low strength	0.80	Cutbanks cave	0.10		
	Depth to saturated zone	0.75				
FoA:						
Fox	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
	Low strength	0.20				
FoB:						
Fox	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
	Low strength	0.20				
FoC2:						
Fox	Very limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Slope	0.04
	Low strength	0.20	Slope	0.04		
	Slope	0.04				
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.72		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
FtA:						
Fulton, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.72		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
GaB:						
Gallman	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
	Low strength	0.03				
GfA:						
Gilford	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GmA:						
Glynwood, limestone substratum---------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Shrink-swell	0.50				
GnB:						
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
GpB2:						
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
GpC2:						
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50	Slope	0.04
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Slope	0.04	Slope	0.04		
GsB:						
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
Blount----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50	Too clayey	0.01		
Houcktown----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
GuB:						
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
Urban Land----------	Not rated		Not rated		Not rated	
HaA:						
Harrod----------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Flooding	1.00	Depth to bedrock	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Flooding	0.80	Depth to bedrock	0.23
	Low strength	0.40	Cutbanks cave	0.10		
	Depth to bedrock	0.23				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HkA:						
Haskins----------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to dense layer	0.50		
	Low strength	0.04	Cutbanks cave	0.10		
HnA:						
Haskins----------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to dense layer	0.50		
	Low strength	0.04	Cutbanks cave	0.10		
HpA:						
Houcktown----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
HpB:						
Houcktown----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.05	Cutbanks cave	0.10		
HrB:						
Houcktown----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Shrink-swell	0.50				
Glynwood----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		
Jenera----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Low strength	0.30	Cutbanks cave	0.10		
HsA:						
Hoytville----------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.28		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
HtA:						
Hoytville----------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.28	Too clayey	1.00
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
JeA:						
Jenera----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Low strength	0.30				
JeB:						
Jenera----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Low strength	0.30				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JfB:						
Jenera	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Cutbanks cave	0.10		
	Depth to saturated zone	0.75				
Shinrock, till substratum	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Cutbanks cave	1.00		
	Depth to saturated zone	0.75	Too clayey	0.02		
JoA:						
Joliet	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Cutbanks cave	0.10	Droughty	0.01
	Low strength	0.20				
KnA:						
Knoxdale	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Low strength	0.80	Depth to saturated zone	0.24		
	Frost action	0.50	Cutbanks cave	0.10		
LbA:						
Lamberjack	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	1.00		
	Low strength	0.05				
LcA:						
Lamberjack	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	1.00		
	Low strength	0.05				
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Too clayey	0.72		
	Frost action	0.50	Cutbanks cave	0.10		
LyE:						
Lybrand	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.53		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Cutbanks cave	0.10		
			Too clayey	0.03		
MbA:						
Medway	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
	Depth to saturated zone	0.75	Flooding	0.60		
	Low strength	0.40				
McA:						
Medway, limestone substratum	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Depth to saturated zone	0.75	Cutbanks cave	0.10		
	Low strength	0.40				
MeA:						
Mermill	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.30				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MfA:						
Mermill----------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	0.30				
MgA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to bedrock	1.00	Depth to bedrock	0.10
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
MnA:						
Milton----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	0.54
	Depth to bedrock	0.54	Too clayey	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				
MpD3:						
Morley----------	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Cutbanks cave	0.10		
MrA:						
Morley, limestone substratum---------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Cutbanks cave	0.10		
MsB:						
Morley, limestone substratum---------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Cutbanks cave	0.10		
Milton----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to bedrock	1.00	Depth to bedrock	0.54
	Depth to bedrock	0.54	Too clayey	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
	Frost action	0.50				
MvB:						
Mortimer----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Too clayey	0.50		
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
MwB2:						
Mortimer----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Too clayey	0.50		
	Depth to saturated zone	0.75	Depth to dense layer	0.50		
	Shrink-swell	0.50	Cutbanks cave	0.10		
NnA:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Too clayey	0.32		
	Shrink-swell	0.50	Cutbanks cave	0.10		
NnB:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Too clayey	0.32		
	Shrink-swell	0.50	Cutbanks cave	0.10		

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
NpA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Too clayey	0.32		
	Shrink-swell	0.50	Cutbanks cave	0.10		
NpB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Too clayey	0.32		
	Shrink-swell	0.50	Cutbanks cave	0.10		
NrA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Low strength	1.00	Too clayey	0.32		
	Shrink-swell	0.50	Cutbanks cave	0.10		
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
OrB:						
Oshtemo	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
OrC:						
Oshtemo	Very limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Slope	0.04
	Slope	0.04	Slope	0.04		
OsB:						
Oshtemo, till substratum	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
			Depth to saturated zone	0.24		
OwB:						
Ottokee	Very limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.12
			Depth to saturated zone	0.99		
PbA:						
Patton	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
	Shrink-swell	0.50				
PmA:						
Pewamo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00	Too clayey	0.03		
	Shrink-swell	0.50				
PnA:						
Pewamo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10		
	Low strength	1.00	Too clayey	0.03		
	Shrink-swell	0.50				
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to bedrock	1.00	Depth to bedrock	0.84
	Low strength	1.00	Cutbanks cave	0.10		
	Depth to bedrock	0.84				
	Shrink-swell	0.50				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RgB:						
Rawson	Very limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.99		
	Low strength	0.05	Depth to dense layer	0.50		
			Cutbanks cave	0.10		
RhA:						
Rensselaer, till substratum	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	0.80				
	Shrink-swell	0.50				
RnA:						
Rimer	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Droughty	0.01
			Depth to dense layer	0.50		
RoA:						
Rimer, deep phase	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	1.00		
RtA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
	Frost action	0.50	Flooding	0.60		
	Low strength	0.30				
SeA:						
Shawtown	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
	Low strength	0.01	Depth to saturated zone	0.99		
SeB:						
Shawtown	Very limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
	Low strength	0.01	Depth to saturated zone	0.99		
SfB:						
Shinrock	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Cutbanks cave	1.00		
	Depth to saturated zone	0.75	Too clayey	0.02		
	Shrink-swell	0.50				
SgC2:						
Shinrock	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Cutbanks cave	1.00	Slope	0.04
	Depth to saturated zone	0.75	Slope	0.04		
	Shrink-swell	0.50	Too clayey	0.02		
	Slope	0.04				
SkB:						
Shinrock, till substratum	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Cutbanks cave	1.00		
	Depth to saturated zone	0.75	Too clayey	0.02		
	Shrink-swell	0.50				
Glynwood	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.75	Too clayey	0.12		
	Shrink-swell	0.50	Cutbanks cave	0.10		

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SmA:						
Shoals	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	0.60	Flooding	0.60
	Low strength	1.00	Cutbanks cave	0.10		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00	Flooding	0.60
	Flooding	1.00	Flooding	0.60		
	Low strength	1.00				
SoA:						
Sloan	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Flooding	0.60	Flooding	0.60
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
SpA:						
Sloan, limestone substratum	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Flooding	0.60	Flooding	0.60
	Flooding	1.00	Cutbanks cave	0.10		
	Low strength	1.00				
StB2:						
St. Clair	Very limited		Very limited		Not limited	
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50	Depth to dense layer	0.50		
			Cutbanks cave	0.10		
StC2:						
St. Clair	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Slope	0.04
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50	Depth to dense layer	0.50		
	Slope	0.04	Cutbanks cave	0.10		
			Slope	0.04		
ThA:						
Thackery, till substratum	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.48
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.48				
TkA:						
Tiderishi	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Low strength	0.20				
TnA:						
Toledo	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Too clayey	0.50		
	Low strength	1.00	Cutbanks cave	0.10		
	Shrink-swell	0.50				
ToB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.19
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.19				

TABLE 22.--BUILDING SITE DEVELOPMENT-Part-2--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TpA:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.19
	Low strength	0.40	Depth to saturated zone	1.00		
	Depth to saturated zone	0.19				
TpB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.19
	Low strength	0.40	Depth to saturated zone	1.00		
	Depth to saturated zone	0.19				
TuB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.19
	Low strength	0.80	Depth to saturated zone	1.00		
	Depth to saturated zone	0.19				
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	0.10		
	Low strength	0.40				
VeA:						
Vaughnsville	Very limited		Somewhat limited		Not limited	
	Frost action	0.50	Depth to saturated zone	0.99		
	Low strength	0.01	Depth to dense layer	0.50		
			Cutbanks cave	0.10		
W:						
Water	Not rated		Not rated		Not rated	
WeA:						
Westland	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Shrink-swell	0.50				
	Low strength	0.40				
Rensselaer	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	1.00				
	Shrink-swell	0.50				

TABLE 23.--SANITARY FACILITIES-Part-1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:				
Adrian	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
AkA:				
Alvada	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	1.00		
AmA:				
Alvada	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	1.00		
Urban Land	Not rated		Not rated	
AnA:				
Aquents	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00		
	Restricted permeability	1.00		
ApB:				
Arkport	Not limited		Very limited	
			Seepage	1.00
			Slope	0.33
ArA:				
Aurand	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00		
AsA:				
Aurand	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00		
Urban Land	Not rated		Not rated	
BgA:				
Biglick	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
Milton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00		
BgB:				
Biglick	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
			Slope	0.33
Milton	Very limited		Very limited	
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Slope	0.33
BnA:				
Blount	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		

TABLE 23.—SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
BoA:				
Blount	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
BoB:				
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.09
	Depth to saturated zone	1.00		
BpA:				
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.01
	Depth to saturated zone	1.00		
Houcktown	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Depth to saturated zone	0.01
			Slope	0.01
BrA:				
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.01
	Depth to saturated zone	1.00		
Jenera	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Depth to saturated zone	0.01
			Slope	0.01
BuA:				
Blount	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
Urban Land	Not rated		Not rated	
ChC:				
Channahon	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.04	Slope	1.00
			Seepage	0.53
Biglick	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.04	Slope	1.00
CoA:				
Colwood	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.72	Seepage	0.53
CtA:				
Cygnet	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	0.46	Depth to saturated zone	0.01
CuA:				
Cygnet	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	0.46	Depth to saturated zone	0.01
Urban Land	Not rated		Not rated	
DbA:				
Darroch	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
DeA:				
Del Rey	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
DfA:				
Del Rey	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.01
	Depth to saturated zone	1.00		
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.01
	Depth to saturated zone	1.00		
DuB:				
Dunbridge	Very limited		Very limited	
	Depth to bedrock	1.00	Seepage	1.00
			Depth to bedrock	1.00
			Slope	0.09
EmA:				
Elliott	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
	Restricted permeability	1.00		
FbA:				
Flatrock	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
FcA:				
Flatrock	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
FdA:				
Flatrock, limestone substratum	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
	Depth to bedrock	0.11		
FoA:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
FoB:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.33
FoC2:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	1.00
	Slope	0.04		
FsA:				
Fulton	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
FtA:				
Fulton, till substratum	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
GaB:				
Gallman	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.33
GfA:				
Gilford	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
GmA:				
Glynwood, limestone substratum	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.01
	Depth to saturated zone	1.00		
	Depth to bedrock	0.22		
GnB:				
Glynwood	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
GpB2:				
Glynwood	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
GpC2:				
Glynwood	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
	Slope	0.04		
GsB:				
Glynwood	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.09
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.01
	Depth to saturated zone	1.00		
Houcktown	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.09
			Depth to saturated zone	0.01
GuB:				
Glynwood	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
Urban Land	Not rated		Not rated	
HaA:				
Harrod	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Restricted permeability	0.46	Seepage	0.53
HkA:				
Haskins	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	1.00		

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
HnA:				
Haskins----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	1.00		
HpA:				
Houcktown----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Depth to saturated zone	0.01
HpB:				
Houcktown----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.33
			Depth to saturated zone	0.01
HrB:				
Houcktown----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.09
			Depth to saturated zone	0.01
Glynwood----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.09
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
Jenera----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.09
			Depth to saturated zone	0.01
HsA:				
Hoytville----------	Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
	Depth to saturated zone	1.00		
HtA:				
Hoytville----------	Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
	Depth to saturated zone	1.00		
JeA:				
Jenera----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Depth to saturated zone	0.01
JeB:				
Jenera----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.33
			Depth to saturated zone	0.01
JfB:				
Jenera----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00	Slope	0.09
			Depth to saturated zone	0.01
Shinrock, till substratum---------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.28
			Slope	0.06
	Restricted permeability	1.00	Depth to saturated zone	0.01
				0.01

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
JoA:				
Joliet	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Seepage	0.53
KnA:				
Knoxdale	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.65	Seepage	1.00
	Restricted permeability	0.46	Depth to saturated zone	0.02
LbA:				
Lamberjack	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00		
	Restricted permeability	0.46		
LcA:				
Lamberjack	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00		
	Restricted permeability	0.46		
Urban Land	Not rated		Not rated	
LuB2:				
Lucas	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.33
LyE:				
Lybrand	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.52
	Depth to saturated zone	0.97		
MbA:				
Medway	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
McA:				
Medway, limestone substratum	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
MeA:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
	Depth to saturated zone	1.00		
MfA:				
Mermill	Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00	Seepage	0.53
	Depth to saturated zone	1.00		
MgA:				
Millsdale	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00		

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
MnA:				
Milton----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00		
MpD3:				
Morley----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Slope	1.00		
MrA:				
Morley, limestone substratum---------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.96
	Restricted permeability	1.00		
	Depth to bedrock	0.06		
MsB:				
Morley, limestone substratum---------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.96
	Restricted permeability	1.00	Slope	0.33
	Depth to bedrock	0.22		
Milton----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Slope	0.33
MvB:				
Mortimer----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
MwB2:				
Mortimer----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
NnA:				
Nappanee----------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
NnB:				
Nappanee----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00		
NpA:				
Nappanee----------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
NpB2:				
Nappanee----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.33
	Depth to saturated zone	1.00		
NrA:				
Nappanee----------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
Urban Land----------	Not rated		Not rated	
OrA:				
Oshtemo----------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
OrB:				
Oshtemo	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.33
OrC:				
Oshtemo	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.04	Slope	1.00
OsB:				
Oshtemo, till substratum	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Depth to saturated zone	0.65	Slope	0.33
			Depth to saturated zone	0.02
OwB:				
Ottokee	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
			Slope	0.09
PbA:				
Patton	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
PmA:				
Pewamo	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
PnA:				
Pewamo	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
Urban Land	Not rated		Not rated	
Pt:				
Pits	Not rated		Not rated	
RcA:				
Randolph	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00		
RgB:				
Rawson	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.33
RhA:				
Rensselaer, till substratum	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00		
RnA:				
Rimer	Very limited		Very limited	
	Restricted permeability	1.00	Seepage	1.00
	Depth to saturated zone	1.00		

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
RoA:				
Rimer, deep phase---	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00		
	Restricted permeability	1.00		
RtA:				
Rossburg----------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	1.00
SeA:				
Shawtown----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	0.96
	Restricted permeability	0.46		
SeB:				
Shawtown----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	0.96
	Restricted permeability	0.46	Slope	0.33
SfB:				
Shinrock----------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Slope	0.33
	Restricted permeability	1.00	Seepage	0.28
			Depth to saturated zone	0.01
SgC2:				
Shinrock----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.28
	Slope	0.04	Depth to saturated zone	0.01
SkB:				
Shinrock, till substratum---------	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.28
	Restricted permeability	1.00	Slope	0.09
			Depth to saturated zone	0.01
Glynwood----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.09
	Depth to saturated zone	1.00	Depth to saturated zone	0.01
SmA:				
Shoals----------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
SnA:				
Sloan----------	Very limited		Very limited	
	Flooding	1.00	Ponding	1.00
	Ponding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.72	Seepage	0.28
SoA:				
Sloan----------	Very limited		Very limited	
	Flooding	1.00	Ponding	1.00
	Ponding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.72	Seepage	0.28

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
SpA:				
Sloan, limestone substratum	Very limited		Very limited	
	Flooding	1.00	Ponding	1.00
	Ponding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.72	Seepage	0.28
	Depth to bedrock	0.01		
StB2:				
St. Clair	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.81
	Depth to saturated zone	1.00	Slope	0.33
StC2:				
St. Clair	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.81
	Slope	0.04		
ThA:				
Thackery, till substratum	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	0.06
	Restricted permeability	0.46		
TkA:				
Tiderishi	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00		
TnA:				
Toledo	Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
ToB:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.33
TpA:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
TpB:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.33
TuB:				
Tuscola	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.33
UcA:				
Udorthents	Not rated		Not rated	
UcD:				
Udorthents	Not rated		Not rated	
Ur:				
Urban Land	Not rated		Not rated	

TABLE 23.--SANITARY FACILITIES-Part-1--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
VaA:				
Vanlue	Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Seepage	0.53
	Restricted permeability	1.00		
VeA:				
Vaughnsville	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.96
			Slope	0.01
W:				
Water	Not rated		Not rated	
WeA:				
Westland	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	0.53
	Restricted permeability	0.46		
Rensselaer	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53

TABLE 24.--SANITARY FACILITIES-Part-2

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too Sandy	1.00
	Too Sandy	1.00			Seepage	1.00
AkA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
AmA:						
Alvada	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Urban Land	Not rated		Not rated		Not rated	
AnA:						
Aquents	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
ApB:						
Arkport	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too Sandy	1.00
	Too Sandy	1.00			Seepage	0.52
ArA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
AsA:						
Aurand	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Urban Land	Not rated		Not rated		Not rated	
BgA:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
	Too clayey	1.00			Depth to bedrock	1.00
					Hard to compact	1.00
BgB:						
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BnA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
BoA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
BoB:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
BpA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
Houcktown	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
BrA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Jenera	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
BuA:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
Urban Land	Not rated		Not rated		Not rated	
ChC:						
Channahon	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
Biglick	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	1.00	Slope	0.04	Too clayey	1.00
	Slope	0.04			Hard to compact	1.00
					Slope	0.04
CoA:						
Colwood	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CtA:						
Cygnet	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Depth to saturated zone	1.00
	Too Sandy	1.00	Depth to saturated zone	1.00	Seepage	0.52
	Depth to saturated zone	1.00			Too Sandy	0.50

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
CuA:						
Cygnet	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50				
Urban Land	Not rated		Not rated		Not rated	
DbA:						
Darroch	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
DeA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
DfA:						
Del Rey	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
DuB:						
Dunbridge	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
	Seepage	1.00	Depth to bedrock	1.00	Seepage	0.52
EmA:						
Elliott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
FbA:						
Flatrock	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	0.22
	Seepage	1.00				
FcA:						
Flatrock	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage	1.00				
FdA:						
Flatrock, limestone substratum	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Depth to bedrock	1.00				
	Seepage	1.00				
FoA:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	1.00			Too Sandy	0.50
FoB:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	1.00			Too Sandy	0.50
					Too clayey	0.50

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FoC2:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too Sandy	1.00	Slope	0.04	Too Sandy	0.50
	Slope	0.04			Slope	0.04
FsA:						
Fulton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
FtA:						
Fulton, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
GaB:						
Gallman	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Seepage	1.00	Seepage	0.52
GfA:						
Gilford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too Sandy	1.00
	Too Sandy	1.00			Seepage	1.00
GmA:						
Glynwood, limestone substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
	Depth to bedrock	1.00			Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
GnB:						
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
GpB2:						
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
GpC2:						
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00	Slope	0.04	Depth to saturated zone	1.00
	Slope	0.04			Slope	0.04
GsB:						
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
Houcktown	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GuB:						
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
Urban Land	Not rated		Not rated		Not rated	
HaA:						
Harrod	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	0.50
	Too clayey	0.50				
HkA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
HnA:						
Haskins	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
HpA:						
Houcktown	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
HpB:						
Houcktown	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
HrB:						
Houcktown	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
Jenera	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
HsA:						
Hoytville	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
HtA:						
Hoytville	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
JeA:						
Jenera	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JeB:						
Jenera	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
JfB:						
Jenera	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
Shinrock, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
JoA:						
Joliet	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
KnA:						
Knoxdale	Very limited		Very limited		Not limited	
	Flooding	1.00	Flooding	1.00		
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage	1.00				
LbA:						
Lamberjack	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.01
LcA:						
Lamberjack	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.01
Urban Land	Not rated		Not rated		Not rated	
LuB2:						
Lucas	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.04	Too clayey	1.00
	Depth to saturated zone	0.68			Hard to compact	1.00
					Depth to saturated zone	0.25
LyE:						
Lybrand	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	1.00			Too clayey	1.00
MbA:						
Medway	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage	1.00				
McA:						
Medway, limestone substratum	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
MeA:						
Mermill	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
MfA:						
Mermill	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
MgA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Too clayey	1.00
	Too clayey	1.00			Depth to bedrock	1.00
					Hard to compact	1.00
MnA:						
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
MpD3:						
Morley	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.25
MrA:						
Morley, limestone substratum	Very limited		Somewhat limited		Somewhat limited	
	Depth to bedrock	1.00	Depth to saturated zone	0.04	Too clayey	0.50
	Depth to saturated zone	0.68			Depth to saturated zone	0.25
	Too clayey	0.50				
MsB:						
Morley, limestone substratum	Very limited		Somewhat limited		Somewhat limited	
	Depth to bedrock	1.00	Depth to saturated zone	0.04	Too clayey	0.50
	Depth to saturated zone	0.68			Depth to saturated zone	0.25
	Too clayey	0.50				
Milton	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
MvB:						
Mortimer	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Hard to compact	1.00
					Depth to saturated zone	1.00
MwB2:						
Mortimer	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Hard to compact	1.00
					Depth to saturated zone	1.00

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NnA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
NnB:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
NpA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
NpB2:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
NrA:						
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
Urban Land	Not rated		Not rated		Not rated	
OrA:						
Oshtemo	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
OrB:						
Oshtemo	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too Sandy	1.00
	Too Sandy	1.00			Seepage	1.00
OrC:						
Oshtemo	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
OsB:						
Oshtemo, till substratum	Very limited		Very limited		Very limited	
	Too Sandy	1.00	Seepage	1.00	Seepage	1.00
					Too Sandy	0.50
OwB:						
Ottokee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
	Seepage	1.00	Seepage	1.00	Too Sandy	0.50
	Too Sandy	1.00			Depth to saturated zone	0.25
PbA:						
Patton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
PmA:						
Pewamo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
PnA:						
Pewamo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
Urban Land	Not rated		Not rated		Not rated	
Pt:						
Pits	Not rated		Not rated		Not rated	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
RgB:						
Rawson	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.25
RhA:						
Rensselaer, till substratum	Very limited		Very limited		Very limited	
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
RnA:						
Rimer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00	Too clayey	1.00
	Too clayey	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Hard to compact	1.00
RoA:						
Rimer, deep phase	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00	Depth to saturated zone	1.00
			Depth to saturated zone	1.00		
RtA:						
Rossburg	Very limited		Very limited		Not limited	
	Flooding	1.00	Flooding	1.00		
	Seepage	1.00				
SeA:						
Shawtown	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.04	Depth to saturated zone	0.25
	Depth to saturated zone	0.68				
SeB:						
Shawtown	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.04	Depth to saturated zone	0.25
	Depth to saturated zone	0.68				
SfB:						
Shinrock	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SgC2:						
Shinrock	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00	Slope	0.04	Depth to saturated zone	1.00
	Slope	0.04			Slope	0.04
SkB:						
Shinrock, till substratum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50				
Glynwood	Very limited		Very limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
	Depth to saturated zone	1.00			Depth to saturated zone	1.00
SmA:						
Shoals	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50				
SoA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50				
SpA:						
Sloan, limestone substratum	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Depth to bedrock	1.00				
StB2:						
St. Clair	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86			Hard to compact	1.00
					Depth to saturated zone	0.47
StC2:						
St. Clair	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.19	Too clayey	1.00
	Depth to saturated zone	0.86	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Depth to saturated zone	0.47
					Slope	0.04

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ThA:						
Thackery, till substratum	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	0.94	Depth to saturated zone	0.96
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50				
TkA:						
Tiderishi	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
TnA:						
Toledo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
ToB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
TpA:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
TpB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
TuB:						
Tuscola	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.86
UcA:						
Udorthents	Not rated		Not rated		Not rated	
UcD:						
Udorthents	Not rated		Not rated		Not rated	
Ur:						
Urban Land	Not rated		Not rated		Not rated	
VaA:						
Vanlue	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
VeA:						
Vaughnsville	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.68	Seepage	1.00	Depth to saturated zone	0.25
			Depth to saturated zone	0.04	Seepage	0.22
W:						
Water	Not rated		Not rated		Not rated	

TABLE 24.--SANITARY FACILITIES-Part-2--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WeA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00				
Rensselaer	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
AdA:							
Adrian	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Leaching limitation	0.45	Low adsorption	1.00		
AkA:							
Alvada	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
AmA:							
Alvada	50	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
Urban Land	25	Not rated		Not rated		Not rated	
AnA:							
Aquents	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
ApB:							
Arkport	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Too acid	0.08	Too acid	0.31	Too acid	0.31
		Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
						Filtering capacity	0.01
ArA:							
Aurand	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
AsA:							
Aurand	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
Urban Land	35	Not rated		Not rated		Not rated	

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
BgA:							
Biglick	70	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Runoff limitation	0.40				
Milton	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.90	Depth to bedrock	0.90	Depth to bedrock	0.90
		Droughty	0.70	Droughty	0.70	Droughty	0.70
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too acid	0.07
BgB:							
Biglick	55	Very limited		Very limited		Very limited	
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Runoff limitation	0.40			Too steep for surface application	0.08
Milton	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.80	Depth to bedrock	0.80	Depth to bedrock	0.80
		Droughty	0.58	Droughty	0.58	Droughty	0.58
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07
BnA:							
Blount	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
BoA:							
Blount	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to dense layer	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Restricted permeability	1.00	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
BoB:							
Blount	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
						Too steep for surface application	0.01
BpA:							
Blount	60	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
Houcktown	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
BrA:							
Blount	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
Jenera	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
BuA:							
Blount	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
Urban Land	40	Not rated		Not rated		Not rated	
ChC:							
Channahon	55	Very limited		Very limited		Very limited	
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Slope	0.04	Too steep for surface application	1.00
		Slope	0.04			Too steep for sprinkler application	0.22
Biglick	40	Very limited		Very limited		Very limited	
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Too steep for surface application	1.00
		Runoff limitation	0.40	Slope	0.04	Restricted permeability	0.60
		Slope	0.04			Too steep for sprinkler application	0.22
CoA:							
Colwood	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CtA:							
Cygnet	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
CuA:							
Cygnet	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
Urban Land	40	Not rated		Not rated		Not rated	
DbA:							
Darroch	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
DeA:							
Del Rey	85	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
DfA:							
Del Rey	55	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
Blount	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
DuB:							
Dunbridge	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Droughty	0.96	Droughty	0.96	Droughty	0.96
		Depth to bedrock	0.84	Depth to bedrock	0.84	Depth to bedrock	0.84
						Too steep for surface application	0.01
EmA:							
Elliott	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Shallow to densic materials	0.06	Shallow to densic materials	0.06		
FbA:							
Flatrock	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
FcA:							
Flatrock	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
FdA:							
Flatrock, limestone substratum	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
FoA:							
Fox	90	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
FoB:							
Fox	90	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
FoC2:							
Fox	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slope	0.04	Too acid	0.07	Too steep for surface application	1.00
		Too acid	0.02	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.07
FsA:							
Fulton	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
FtA:							
Fulton, till substratum	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
GaB:							
Gallman	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
						Filtering capacity	0.01
GfA:							
Gilford	90	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
GmA:							
Glynwood, limestone substratum	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
GnB:							
Glynwood	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
						Too steep for surface application	0.08
GpB2:							
Glynwood	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
						Too steep for surface application	0.08

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
GpC2:							
Glynwood	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Slope	0.04	Too acid	0.07	Too steep for surface application	1.00
		Too acid	0.02	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.07
GsB:							
Glynwood	40	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
						Too steep for surface application	0.01
Blount	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
Houcktown	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
						Too steep for surface application	0.01
GuB:							
Glynwood	55	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
						Too steep for surface application	0.08
Urban Land	35	Not rated		Not rated		Not rated	
HaA:							
Harrod	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.23	Depth to bedrock	0.23	Depth to bedrock	0.23
HkA:							
Haskins	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
HnA:							
Haskins	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
HpA:							
Houcktown	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
HpB:							
Houcktown	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
						Too steep for surface application	0.08
HrB:							
Houcktown	40	Very limited		Very limited		Very limited	
		Depth to dense layer	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	0.60	Restricted permeability	0.60
		Restricted permeability	0.74	Droughty	0.06	Droughty	0.06
		Droughty	0.06			Too steep for surface application	0.01
Glynwood	30	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
						Too steep for surface application	0.01
Jenera	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
						Too steep for surface application	0.01
HsA:							
Hoytville	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
HtA:							
Hoytville	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
JeA:							
Jenera	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
JeB:							
Jenera	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
						Filtering capacity	0.01
JfB:							
Jenera	55	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
						Too steep for surface application	0.01
Shinrock, till substratum	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too acid	0.07
						Too steep for surface application	0.01
JoA:							
Joliet	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	0.83	Droughty	0.83	Droughty	0.83
		Runoff limitation	0.40				
KnA:							
Knoxdale	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Flooding	0.60
LbA:							
Lamberjack	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
LcA:							
Lamberjack	40	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Urban Land	35	Not rated		Not rated		Not rated	
LuB2:							
Lucas	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Runoff limitation	0.40	Too acid	0.07	Too steep for surface application	0.08
		Too acid	0.02			Too acid	0.07

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
LyE:							
Lybrand	95	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
		Too acid	0.02	Too acid	0.07	Restricted permeability	1.00
						Too acid	0.07
MbA:							
Medway	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
McA:							
Medway, limestone substratum	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
MeA:							
Mermill	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
MfA:							
Mermill	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
MgA:							
Millsdale	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Depth to bedrock	0.10	Depth to bedrock	0.10	Depth to bedrock	0.10
		Droughty	0.01	Droughty	0.01	Droughty	0.01
MnA:							
Milton	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.54	Depth to bedrock	0.54	Depth to bedrock	0.54
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Droughty	0.24	Droughty	0.24	Droughty	0.24
		Too acid	0.02	Too acid	0.07	Too acid	0.07
MpD3:							
Morley	90	Very limited		Very limited		Very limited	
		Depth to dense layer	1.00	Slope	1.00	Too steep for surface application	1.00
		Slope	1.00	Depth to saturated zone	0.68	Too steep for sprinkler application	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Depth to saturated zone	0.68
		Depth to saturated zone	0.68	Droughty	0.22	Restricted permeability	0.60
		Droughty	0.22	Too acid	0.07	Droughty	0.22

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
MrA:							
Morley, limestone substratum---------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
		Too acid	0.02	Too acid	0.07	Too acid	0.07
MsB:							
Morley, limestone substratum---------	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07
Milton----------	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.54	Depth to bedrock	0.54	Depth to bedrock	0.54
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Droughty	0.27	Droughty	0.27	Droughty	0.27
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07
MvB:							
Mortimer----------	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too steep for surface application	0.08
		Too acid	0.02			Too acid	0.07
MwB2:							
Mortimer----------	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too steep for surface application	0.08
		Too acid	0.02			Too acid	0.07
NnA:							
Nappanee----------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
NnB:							
Nappanee----------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too steep for surface application	0.08
		Too acid	0.02	Droughty	0.02	Too acid	0.07
		Droughty	0.02			Droughty	0.02

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
NpA:							
Nappanee	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
NpB2:							
Nappanee	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Droughty	0.24	Droughty	0.24
		Droughty	0.24	Too acid	0.07	Too steep for surface application	0.08
		Too acid	0.02			Too acid	0.07
NrA:							
Nappanee	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Too acid	0.07	Too acid	0.07
		Too acid	0.02				
Urban Land	40	Not rated		Not rated		Not rated	
OrA:							
Oshtemo	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.11	Too acid	0.42	Too acid	0.42
OrB:							
Oshtemo	93	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.11	Too acid	0.42	Too acid	0.42
						Too steep for surface application	0.08
OrC:							
Oshtemo	95	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.11	Too acid	0.42	Too steep for surface application	1.00
		Slope	0.04	Slope	0.04	Too acid	0.42
						Too steep for sprinkler application	0.22
OsB:							
Oshtemo, till substratum	92	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
OwB:							
Ottokee	80	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Leaching limitation	0.45			Too steep for surface application	0.01
PbA:							
Patton	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
PmA:							
Pewamo	94	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
PnA:							
Pewamo	50	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
Urban Land	30	Not rated		Not rated		Not rated	
Pt:							
Pits	90	Not rated		Not rated		Not rated	
RcA:							
Randolph	93	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to bedrock	0.84	Depth to bedrock	0.84	Depth to bedrock	0.84
		Droughty	0.56	Droughty	0.56	Droughty	0.56
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too acid	0.07
RgB:							
Rawson	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Droughty	0.20	Too acid	0.31	Too acid	0.31
		Too acid	0.08	Droughty	0.20	Droughty	0.20
		Shallow to densic materials	0.06	Shallow to densic materials	0.06	Too steep for surface application	0.08
RhA:							
Rensselaer, till substratum	88	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
RnA:							
Rimer	95	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Droughty	0.19	Droughty	0.19	Droughty	0.19
		Too acid	0.02	Too acid	0.07	Too acid	0.07
RoA:							
Rimer, deep phase	95	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Too acid	0.02	Too acid	0.07	Too acid	0.07
RtA:							
Rossburg	85	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Flooding	0.60
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
SeA:							
Shawtown	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
SeB:							
Shawtown	91	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
						Too steep for surface application	0.08
SfB:							
Shinrock	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
						Too acid	0.07
SgC2:							
Shinrock	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Too steep for surface application	1.00
		Slope	0.04	Too acid	0.07	Restricted permeability	0.31
		Too acid	0.02	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.07

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
SkB:							
Shinrock, till substratum	50	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
		Too acid	0.02	Too acid	0.07	Too acid	0.07
						Too steep for surface application	0.01
Glynwood	40	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.08	Too acid	0.31	Too acid	0.31
		Shallow to densic materials	0.01	Shallow to densic materials	0.01	Too steep for surface application	0.01
		Droughty	0.01	Droughty	0.01	Droughty	0.01
SmA:							
Shoals	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	0.60
SnA:							
Sloan	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	0.60
SoA:							
Sloan	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	0.60
SpA:							
Sloan, limestone substratum	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	0.60
StB2:							
St. Clair	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
		Runoff limitation	0.40			Too steep for surface application	0.08
StC2:							
St. Clair	95	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too steep for surface application	1.00
		Runoff limitation	0.40	Slope	0.04	Depth to saturated zone	0.86
		Slope	0.04	Droughty	0.03	Too steep for sprinkler application	0.22
		Droughty	0.03			Droughty	0.03

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
ThA:							
Thackery, till substratum	80	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.02	Too acid	0.07	Too acid	0.07
TkA:							
Tiderishi	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60
		Too acid	0.02	Too acid	0.07	Too acid	0.07
TnA:							
Toledo	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40				
ToB:							
Tuscola	93	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
						Filtering capacity	0.01
TpA:							
Tuscola	93	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
TpB:							
Tuscola	93	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	0.01	Filtering capacity	0.01	Too steep for surface application	0.08
						Filtering capacity	0.01
TuB:							
Tuscola	95	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Too steep for surface application	0.08
UcA:							
Udorthents	75	Not rated		Not rated		Not rated	
UcD:							
Udorthents	85	Not rated		Not rated		Not rated	
Ur:							
Urban Land	88	Not rated		Not rated		Not rated	
VaA:							
Vanlue	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.74	Restricted permeability	0.60	Restricted permeability	0.60

TABLE 25.--AGRICULTURAL WASTE MANAGEMENT--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
VeA:							
Vaughnsville	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
		Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
W:							
Water	100	Not rated		Not rated		Not rated	
WeA:							
Westland	50	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Rensselaer	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

TABLE 26.--WATER MANAGEMENT-Part-1

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:							
Adrian	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00		
				Seepage	0.98		
AkA:							
Alvada	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.19		
AmA:							
Alvada	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.29		
Urban Land	25	Not rated		Not rated		Not rated	
AnA:							
Aquents	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
ApB:							
Arkport	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Deep to water	1.00
ArA:							
Aurand	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.19		
				Thin layer	0.16		
AsA:							
Aurand	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.20		
				Thin layer	0.11		
Urban Land	35	Not rated		Not rated		Not rated	
BgA:							
Biglick	70	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Hard to pack	0.50		
Milton	25	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.98	Thin layer	0.98	Deep to water	1.00
		Seepage	0.04	Hard to pack	0.43		
BgB:							
Biglick	55	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Hard to pack	0.50		
Milton	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.95	Thin layer	0.95	Deep to water	1.00
		Seepage	0.04	Hard to pack	0.35		
BnA:							
Blount	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.01		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
BoA:							
Blount	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.02		
BoB:							
Blount	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.26		
BpA:							
Blount	60	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.34		
Houcktown	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.09		
				Thin layer	0.06		
BrA:							
Blount	55	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.06		
Jenera	40	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.29		
				Piping	0.24		
BuA:							
Blount	50	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.37		
Urban Land	40	Not rated		Not rated		Not rated	
ChC:							
Channahon	55	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00				
Biglick	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Hard to pack	0.50		
CoA:							
Colwood	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.96		
CtA:							
Cygnet	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
				Seepage	0.43		
				Thin layer	0.04		
CuA:							
Cygnet	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.01		
Urban Land	40	Not rated		Not rated		Not rated	

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
DbA:							
Darroch	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.98	Cutbanks cave	0.10
DeA:							
Del Rey	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.02		
DfA:							
Del Rey	55	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.01		
Blount	40	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.29		
DuB:							
Dunbridge	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.96	Deep to water	1.00
		Depth to bedrock	0.96				
EmA:							
Elliott	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.66		
FbA:							
Flatrock	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.68		
FcA:							
Flatrock	90	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.69		
FdA:							
Flatrock, limestone substratum	95	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.69		
FoA:							
Fox	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.23	Deep to water	1.00
FoB:							
Fox	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.23	Deep to water	1.00
FoC2:							
Fox	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.23	Deep to water	1.00
FsA:							
Fulton	80	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.40		
FtA:							
Fulton, till substratum	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.38		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
GaB:							
Gallman	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
GfA:							
Gilford	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00		
				Seepage	0.99		
GmA:							
Glynwood, limestone substratum	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.01	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.46		
GnB:							
Glynwood	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.19		
GpB2:							
Glynwood	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.46		
GpC2:							
Glynwood	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.42		
GsB:							
Glynwood	40	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.19		
Blount	35	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.29		
Houcktown	15	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.30		
				Thin layer	0.26		
GuB:							
Glynwood	55	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.13		
Urban Land	35	Not rated		Not rated		Not rated	
HaA:							
Harrod	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.78	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Seepage	0.72	Thin layer	0.78	Slow refill	0.28
				Piping	0.57	Cutbanks cave	0.10
HkA:							
Haskins	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.21		
				Thin layer	0.03		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
HnA:							
Haskins	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.19		
				Thin layer	0.06		
HpA:							
Houcktown	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.19		
				Thin layer	0.09		
HpB:							
Houcktown	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.12		
				Thin layer	0.11		
HrB:							
Houcktown	40	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.26		
				Piping	0.05		
Glynwood	30	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.19		
Jenera	25	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.50		
				Thin layer	0.01		
HsA:							
Hoytville	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
HtA:							
Hoytville	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
JeA:							
Jenera	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.31		
JeB:							
Jenera	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.36		
JfB:							
Jenera	55	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.50		
Shinrock, till substratum	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.54	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.06		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
JoA:							
Joliet	95	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Seepage	0.01	Thin layer	1.00	Slow refill	0.28
				Piping	0.88	Cutbanks cave	0.10
KnA:							
Knoxdale	90	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Piping	0.85	Deep to water	0.99
				Seepage	0.01	Cutbanks cave	0.10
LbA:							
Lamberjack	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
LcA:							
Lamberjack	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
Urban Land	35	Not rated		Not rated		Not rated	
LuB2:							
Lucas	95	Not limited		Somewhat limited		Very limited	
				Depth to saturated zone	0.68	Deep to water	1.00
				Hard to pack	0.38		
LyE:							
Lybrand	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.68	Thin layer	0.19	Deep to water	1.00
MbA:							
Medway	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.90		
				Seepage	0.10		
McA:							
Medway, limestone substratum	90	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.83		
MeA:							
Mermill	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.03		
MfA:							
Mermill	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.04		
MgA:							
Millsdale	90	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.69	Ponding	1.00	Depth to bedrock	1.00
		Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.28
				Thin layer	0.70	Cutbanks cave	0.10
MnA:							
Milton	90	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.88	Thin layer	0.88	Deep to water	1.00
		Seepage	0.04	Hard to pack	0.37		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
MpD3:							
Morley	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.03	Depth to saturated zone	0.68	Deep to water	1.00
		Seepage	0.02	Thin layer	0.52		
MrA:							
Morley, limestone substratum	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Depth to saturated zone	0.68	Deep to water	1.00
				Thin layer	0.26		
MsB:							
Morley, limestone substratum	60	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Depth to saturated zone	0.68	Deep to water	1.00
				Thin layer	0.37		
Milton	30	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.88	Thin layer	0.88	Deep to water	1.00
		Seepage	0.04	Hard to pack	0.30		
MvB:							
Mortimer	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.50		
				Thin layer	0.13		
MwB2:							
Mortimer	95	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Hard to pack	0.50		
				Thin layer	0.06		
NnA:							
Nappanee	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.01		
NnB:							
Nappanee	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.22		
NpA:							
Nappanee	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.01		
NpB2:							
Nappanee	90	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.46		
				Hard to pack	0.26		
NrA:							
Nappanee	50	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.13		
Urban Land	40	Not rated		Not rated		Not rated	
OrA:							
Oshtemo	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.90	Deep to water	1.00
OrB:							
Oshtemo	93	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.90	Deep to water	1.00

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
OrC:							
Oshtemo	95	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.90	Deep to water	1.00
OsB:							
Oshtemo, till substratum	92	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.30	Deep to water	1.00
OwB:							
Ottokee	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.68	Cutbanks cave	1.00
				Seepage	0.65	Deep to water	0.14
PbA:							
Patton	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.12		
PmA:							
Pewamo	94	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
PnA:							
Pewamo	50	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
Urban Land	30	Not rated		Not rated		Not rated	
Pt:							
Pits	90	Not rated		Not rated		Not rated	
RcA:							
Randolph	93	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.96	Depth to saturated zone	1.00	Depth to bedrock	1.00
		Seepage	0.04	Thin layer	0.96	Slow refill	0.28
						Cutbanks cave	0.10
RgB:							
Rawson	95	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Depth to saturated zone	0.68	Deep to water	1.00
				Thin layer	0.66		
				Seepage	0.09		
RhA:							
Rensselaer, till substratum	88	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Ponding	1.00	Deep to water	1.00
				Depth to saturated zone	1.00		
				Piping	0.52		
RnA:							
Rimer	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.66		
				Thin layer	0.03		
RoA:							
Rimer, deep phase	95	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
				Seepage	0.09		
RtA:							
Rossburg	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.01		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
SeA:							
Shawtown----------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.68	Deep to water	1.00
SeB:							
Shawtown----------	91	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.68	Deep to water	1.00
SfB:							
Shinrock----------	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.54	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.01		
SgC2:							
Shinrock----------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.54	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.02		
SkB:							
Shinrock, till substratum---------	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.54	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.03		
Glynwood----------	40	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Deep to water	1.00
				Thin layer	0.52		
SmA:							
Shoals----------	95	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.85	Cutbanks cave	0.10
SnA:							
Sloan----------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.54	Ponding	1.00	Cutbanks cave	1.00
				Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.92		
				Seepage	0.01		
SoA:							
Sloan----------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.54	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.80		
				Seepage	0.01		
SpA:							
Sloan, limestone substratum---------	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.54	Ponding	1.00	Slow refill	0.28
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.93		
				Seepage	0.01		
StB2:							
St. Clair----------	90	Not limited		Somewhat limited		Very limited	
				Depth to saturated zone	0.86	Deep to water	1.00
				Hard to pack	0.43		
				Thin layer	0.16		
StC2:							
St. Clair----------	95	Not limited		Somewhat limited		Very limited	
				Depth to saturated zone	0.86	Deep to water	1.00
				Hard to pack	0.45		
				Thin layer	0.37		

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
ThA:							
Thackery, till substratum	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Deep to water	1.00
TkA:							
Tiderishi	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.36		
TnA:							
Toledo	90	Not limited		Very limited		Somewhat limited	
				Ponding	1.00	Slow refill	0.96
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	0.41		
ToB:							
Tuscola	93	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.66	Slow refill	0.28
						Deep to water	0.01
TpA:							
Tuscola	93	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.74	Slow refill	0.28
						Deep to water	0.01
TpB:							
Tuscola	93	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.74	Slow refill	0.28
						Deep to water	0.01
TuB:							
Tuscola	95	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Piping	0.73	Slow refill	0.28
						Deep to water	0.01
UcA:							
Udorthents	75	Not rated		Not rated		Not rated	
UcD:							
Udorthents	85	Not rated		Not rated		Not rated	
Ur:							
Urban Land	88	Not rated		Not rated		Not rated	
VaA:							
Vanlue	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Depth to saturated zone	1.00	Deep to water	1.00
				Piping	0.52		
VeA:							
Vaughnsville	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.68	Deep to water	1.00
				Piping	0.67		
				Thin layer	0.26		
W:							
Water	100	Not rated		Not rated		Not rated	

TABLE 26.--WATER MANAGEMENT-Part-1--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WeA:							
Westland	50	Very limited Seepage	 1.00	Very limited Ponding Depth to saturated zone Seepage	 1.00 1.00 0.39	Very limited Cutbanks cave	 1.00
Rensselaer	40	Somewhat limited Seepage	 0.72	Very limited Ponding Depth to saturated zone Piping Seepage	 1.00 1.00 0.82 0.06	Very limited Cutbanks cave Slow refill	 1.00 0.28

TABLE 27.--WATER MANAGEMENT-Part-2

(The information in this table indicates the dominant soil condition but does not eliminate the need for on-site investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AdA:							
Adrian	100	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
				Depth to saturated zone	1.00	Frost action	1.00
				Too Sandy	1.00	cutbanks cave	0.90
AkA:							
Alvada	80	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.17	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.17	cutbanks cave	0.90
AmA:							
Alvada	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.17	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.17		
Urban Land	25	Not rated		Not rated		Not rated	
AnA:							
Aquents	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.21	Water erosion	0.89	percs slowly	0.22
				Restricted permeability	0.21		
ApB:							
Arkport	90	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.56	Too Sandy	1.00	cutbanks cave	0.90
		Slope	0.36	Water erosion	0.56	slope	0.04
		Droughty	0.03	Slope	0.36		
ArA:							
Aurand	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
AsA:							
Aurand	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
Urban Land	35	Not rated		Not rated		Not rated	

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BgA:							
Biglick	70	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	depth to bedrock	0.74
		Water erosion	0.89	Water erosion	0.89	percs slowly	0.40
		Droughty	0.85	Restricted permeability	0.43		
		Restricted permeability	0.43				
Milton	25	Very Limited		Very Limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	depth to bedrock	0.30
		Depth to bedrock	1.00	Depth to bedrock	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
BgB:							
Biglick	55	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	depth to bedrock	0.78
		Droughty	0.94	Water erosion	0.89	percs slowly	0.40
		Water erosion	0.89	Restricted permeability	0.43	slope	0.04
		Restricted permeability	0.43	Slope	0.36		
		Slope	0.36				
Milton	40	Very Limited		Very Limited		Slightly limited	
		Water erosion	1.00	Water erosion	1.00	depth to bedrock	0.23
		Depth to bedrock	1.00	Depth to bedrock	1.00	percs slowly	0.22
		Slope	0.36	Slope	0.36	slope	0.04
		Restricted permeability	0.21	Restricted permeability	0.21		
BnA:							
Blount	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
BoA:							
Blount	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
BoB:							
Blount	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.16	Slope	0.16		
BpA:							
Blount	60	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.04	Slope	0.04		
Houcktown	35	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
		Slope	0.04	Slope	0.04		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BrA:							
Blount	55	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.04	Slope	0.04		
Jenera	40	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
		Slope	0.04	Slope	0.04		
BuA:							
Blount	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
Urban Land	40	Not rated		Not rated		Not rated	
ChC:							
Channahon	55	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	slope	0.96
		Slope	1.00	Slope	1.00	depth to bedrock	0.78
		Water erosion	0.89	Water erosion	0.89		
		Droughty	0.87	Content of large stones	0.77		
		Content of large stones	0.77				
Biglick	40	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	slope	0.96
		Slope	1.00	Slope	1.00	depth to bedrock	0.82
		Droughty	1.00	Water erosion	0.89	percs slowly	0.40
		Water erosion	0.89	Restricted permeability	0.43		
		Restricted permeability	0.43				
CoA:							
Colwood	80	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	ponded	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	Frost action	1.00
CtA:							
Cygnet	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56		
CuA:							
Cygnet	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56		
Urban Land	40	Not rated		Not rated		Not rated	
DbA:							
Darroch	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains: Rating class and limiting features	Value	Constructing Terraces and Diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
DeA:							
Del Rey----------	85	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
DfA:							
Del Rey----------	55	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.04	Slope	0.04		
Blount----------	40	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.04	Slope	0.04		
DuB:							
Dunbridge----------	100	Very Limited		Very Limited		Slightly limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	depth to bedrock	0.26
		Droughty	0.18	Slope	0.16		
		Slope	0.16	Water erosion	0.01		
		Water erosion	0.01				
EmA:							
Elliott----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
FbA:							
Flatrock----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	flooding	0.90
FcA:							
Flatrock----------	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	flooding	0.90
FdA:							
Flatrock, limestone substratum---------	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	flooding	0.90
FoA:							
Fox----------	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	cutbanks cave	0.90
FoB:							
Fox----------	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	cutbanks cave	0.90
		Slope	0.36	Slope	0.36	slope	0.04
FoC2:							
Fox----------	100	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	slope	0.96
		Slope	1.00	Slope	1.00	cutbanks cave	0.90

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FsA:							
Fulton	80	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
FtA:							
Fulton, till substratum	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
GaB:							
Gallman	90	Somewhat Limited		Somewhat Limited		Slightly limited	
		Water erosion	0.89	Water erosion	0.89	slope	0.04
		Slope	0.36	Slope	0.36		
GfA:							
Gilford	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	ponded	1.00
		Water erosion	0.01	Too Sandy	1.00	Frost action	1.00
				Water erosion	0.01	cutbanks cave	0.90
GmA:							
Glynwood, limestone substratum	100	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
GnB:							
Glynwood	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
GpB2:							
Glynwood	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
GpC2:							
Glynwood	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Slope	1.00	Depth to saturated zone	1.00	slope	0.96
		Depth to saturated zone	1.00	Slope	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GsB:							
Glynwood	40	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.16	Slope	0.16		
Blount	35	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.04	Slope	0.04		
Houcktown	15	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
		Slope	0.16	Slope	0.16		
GuB:							
Glynwood	55	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
Urban Land	35	Not rated		Not rated		Not rated	
HaA:							
Harrod	90	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to bedrock	1.00	flooding	0.60
		Water erosion	0.56	Water erosion	0.56	depth to bedrock	0.06
HkA:							
Haskins	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.98	Restricted permeability	0.98	percs slowly	0.94
		Water erosion	0.56	Water erosion	0.56		
HnA:							
Haskins	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.94
		Restricted permeability	0.98	Restricted permeability	0.98		
HpA:							
Houcktown	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
HpB:							
Houcktown	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43	slope	0.04
		Slope	0.36	Slope	0.36		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HrB:							
Houcktown----------	40	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Restricted permeability	0.43		
		Slope	0.16	Slope	0.16		
Glynwood----------	30	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.16	Slope	0.16		
Jenera----------	25	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89		
		Slope	0.16	Slope	0.16		
HsA:							
Hoytville----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.56	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.21	Water erosion	0.56	percs slowly	0.22
				Restricted permeability	0.21		
HtA:							
Hoytville----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.56	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.21	Water erosion	0.56	percs slowly	0.22
				Restricted permeability	0.21		
JeA:							
Jenera----------	85	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
JeB:							
Jenera----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	slope	0.04
		Slope	0.36	Slope	0.36		
JfB:							
Jenera----------	55	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
		Slope	0.16	Slope	0.16		
Shinrock, till substratum---------	35	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
		Slope	0.16	Slope	0.16		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JoA:							
Joliet	95	Very Limited		Very Limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	depth to bedrock	0.58
		Water erosion	0.89	Water erosion	0.89		
		Droughty	0.01				
KnA:							
Knoxdale	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Deep to water	1.00
						flooding	0.90
LbA:							
Lamberjack	85	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56		
LcA:							
Lamberjack	40	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56		
Urban Land	35	Not rated		Not rated		Not rated	
LuB2:							
Lucas	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.94
		Restricted permeability	0.98	Depth to saturated zone	1.00	slope	0.04
		Slope	0.36	Restricted permeability	0.98		
		Depth to saturated zone	0.25	Slope	0.36		
LyE:							
Lybrand	95	Very Limited		Very Limited		Very limited	
		Slope	1.00	Water erosion	1.00	slope	1.00
		Water erosion	1.00	Slope	1.00	Deep to water	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	percs slowly	0.91
MbA:							
Medway	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	flooding	0.90
McA:							
Medway, limestone substratum	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	flooding	0.90
MeA:							
Mermill	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Restricted permeability	0.98	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Restricted permeability	0.98	percs slowly	0.94
				Water erosion	0.56		
MfA:							
Mermill	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	ponded	1.00
		Water erosion	1.00	Ponding	1.00	Frost action	1.00
		Restricted permeability	0.98	Depth to saturated zone	1.00	percs slowly	0.94
				Restricted permeability	0.98		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgA:							
Millsdale----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Depth to bedrock	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Depth to bedrock	1.00	percs slowly	0.22
		Restricted permeability	0.21	Water erosion	0.56	depth to bedrock	0.02
				Restricted permeability	0.21		
MnA:							
Milton----------	90	Very Limited		Very Limited		Slightly limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.22
		Depth to bedrock	1.00	Depth to bedrock	1.00	depth to bedrock	0.14
		Restricted permeability	0.21	Restricted permeability	0.21		
MpD3:							
Morley----------	90	Very Limited		Very Limited		Very limited	
		Slope	1.00	Water erosion	1.00	slope	1.00
		Water erosion	1.00	Slope	1.00	percs slowly	0.40
		Restricted permeability	0.43	Depth to saturated zone	1.00		
		Depth to saturated zone	0.25	Restricted permeability	0.43		
MrA:							
Morley, limestone substratum---------	95	Very Limited		Very Limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.40
		Restricted permeability	0.43	Depth to saturated zone	1.00		
		Depth to saturated zone	0.25	Restricted permeability	0.43		
MsB:							
Morley, limestone substratum---------	60	Very Limited		Very Limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.40
		Restricted permeability	0.43	Depth to saturated zone	1.00	slope	0.04
		Slope	0.36	Restricted permeability	0.43		
		Depth to saturated zone	0.25	Slope	0.36		
Milton----------	30	Very Limited		Very Limited		Slightly limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.22
		Depth to bedrock	1.00	Depth to bedrock	1.00	depth to bedrock	0.14
		Slope	0.36	Slope	0.36	slope	0.04
		Restricted permeability	0.21	Restricted permeability	0.21		
MvB:							
Mortimer----------	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
MwB2:							
Mortimer----------	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NnA:							
Nappanee----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
NnB:							
Nappanee----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
NpA:							
Nappanee----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
NpB2:							
Nappanee----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96	slope	0.04
		Slope	0.36	Slope	0.36		
NrA:							
Nappanee----------	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
Urban Land----------	40	Not rated		Not rated		Not rated	
OrA:							
Oshtemo----------	85	Slightly Limited		Slightly Limited		Very limited	
		Water erosion	0.17	Water erosion	0.17	cutbanks cave	0.90
OrB:							
Oshtemo----------	93	Somewhat Limited		Very Limited		Very limited	
		Slope	0.36	Too Sandy	1.00	cutbanks cave	0.90
		Water erosion	0.17	Slope	0.36	slope	0.04
				Water erosion	0.17		
OrC:							
Oshtemo----------	95	Very Limited		Very Limited		Very limited	
		Slope	1.00	Slope	1.00	slope	0.96
		Water erosion	0.17	Water erosion	0.17	cutbanks cave	0.90
OsB:							
Oshtemo, till substratum---------	92	Somewhat Limited		Somewhat Limited		Very limited	
		Slope	0.36	Slope	0.36	Deep to water	1.00
		Water erosion	0.17	Water erosion	0.17	cutbanks cave	0.90
						slope	0.04
OwB:							
Ottokee----------	80	Somewhat Limited		Very Limited		Very limited	
		Depth to saturated zone	0.25	Depth to saturated zone	1.00	cutbanks cave	0.90
		Slope	0.16	Slope	0.16		
		Droughty	0.12				

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PbA:							
Patton----------	85	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	ponded	1.00
		Water erosion	1.00	Ponding	1.00	Frost action	1.00
				Depth to saturated zone	1.00		
PmA:							
Pewamo----------	94	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.21	Water erosion	0.89	percs slowly	0.22
				Restricted permeability	0.21		
PnA:							
Pewamo----------	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.21	Water erosion	0.89	percs slowly	0.22
				Restricted permeability	0.21		
Urban Land----------	30	Not rated		Not rated		Not rated	
Pt:							
Pits----------	90	Not rated		Not rated		Not rated	
RcA:							
Randolph----------	93	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	Frost action	1.00
		Water erosion	1.00	Depth to saturated zone	1.00	depth to bedrock	0.26
		Depth to bedrock	1.00	Depth to bedrock	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
RgB:							
Rawson----------	95	Somewhat Limited		Very Limited		Very limited	
		Restricted permeability	0.98	Depth to saturated zone	1.00	percs slowly	0.94
		Water erosion	0.89	Restricted permeability	0.98	slope	0.04
		Slope	0.36	Water erosion	0.89		
		Depth to saturated zone	0.25	Slope	0.36		
RhA:							
Rensselaer, till substratum---------	88	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	ponded	1.00
		Water erosion	1.00	Ponding	1.00	Frost action	1.00
				Depth to saturated zone	1.00		
RnA:							
Rimer----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Restricted permeability	0.96	Restricted permeability	0.96	percs slowly	0.91
		Droughty	0.01	Water erosion	0.01	cutbanks cave	0.90
		Water erosion	0.01				

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoA:							
Rimer, deep phase---	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
						cutbanks cave	0.90
RtA:							
Rossburg----------	85	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	flooding	0.90
SeA:							
Shawtown----------	85	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.56	Depth to saturated zone	1.00	cutbanks cave	0.90
		Depth to saturated zone	0.25	Water erosion	0.56		
SeB:							
Shawtown----------	91	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.56	Depth to saturated zone	1.00	cutbanks cave	0.90
		Slope	0.36	Water erosion	0.56	slope	0.04
		Depth to saturated zone	0.25	Slope	0.36		
SfB:							
Shinrock----------	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.22
		Slope	0.36	Slope	0.36	slope	0.04
		Restricted permeability	0.21	Restricted permeability	0.21		
SgC2:							
Shinrock----------	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Slope	1.00	Depth to saturated zone	1.00	slope	0.96
		Depth to saturated zone	1.00	Slope	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
SkB:							
Shinrock, till substratum---------	50	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
		Slope	0.16	Slope	0.16		
Glynwood----------	40	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	percs slowly	0.91
		Restricted permeability	0.96	Restricted permeability	0.96		
		Slope	0.16	Slope	0.16		
SmA:							
Shoals----------	95	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	flooding	0.90
SnA:							
Sloan----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.89	flooding	0.90

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SoA:							
Sloan----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.89	flooding	0.90
SpA:							
Sloan, limestone substratum---------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.89	flooding	0.90
StB2:							
St. Clair----------	90	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	percs slowly	0.91
		Restricted permeability	0.96	Depth to saturated zone	1.00	slope	0.04
		Depth to saturated zone	0.47	Restricted permeability	0.96		
		Slope	0.36	Slope	0.36		
StC2:							
St. Clair----------	95	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	slope	0.96
		Slope	1.00	Slope	1.00	percs slowly	0.91
		Restricted permeability	0.96	Depth to saturated zone	1.00		
		Depth to saturated zone	0.47	Restricted permeability	0.96		
ThA:							
Thackery, till substratum---------	80	Very Limited		Very Limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Frost action	1.00
		Depth to saturated zone	0.96	Depth to saturated zone	1.00	cutbanks cave	0.90
TkA:							
Tiderishi----------	85	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Water erosion	0.56		
TnA:							
Toledo----------	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Restricted permeability	0.96	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.56	Restricted permeability	0.96	percs slowly	0.91
				Water erosion	0.56		
ToB:							
Tuscola----------	93	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Depth to saturated zone	0.86	Water erosion	0.89	slope	0.04
		Slope	0.36	Slope	0.36		
TpA:							
Tuscola----------	93	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Depth to saturated zone	0.86	Water erosion	0.89		
TpB:							
Tuscola----------	93	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Depth to saturated zone	0.86	Water erosion	0.89	slope	0.04
		Slope	0.36	Slope	0.36		

TABLE 27.--WATER MANAGEMENT-Part-2--Continued

Map symbol and soil name	Pct of map unit	Constructing Grassed Waterways and Surface Drains		Constructing Terraces and Diversions		Drainage	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TuB:							
Tuscola	95	Somewhat Limited		Very Limited		Very limited	
		Water erosion	0.89	Depth to saturated zone	1.00	Frost action	1.00
		Depth to saturated zone	0.86	Water erosion	0.89	slope	0.04
		Slope	0.36	Slope	0.36		
UcA:							
Udorthents	75	Not rated		Not rated		Not rated	
						percs slowly	1.00
UcD:							
Udorthents	85	Not rated		Not rated		Not rated	
						percs slowly	1.00
						slope	1.00
Ur:							
Urban Land	88	Not rated		Not rated		Not rated	
VaA:							
Vanlue	90	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
		Water erosion	0.89	Water erosion	0.89	percs slowly	0.22
		Restricted permeability	0.21	Restricted permeability	0.21		
VeA:							
Vaughnsville	100	Somewhat Limited		Very Limited		Somewhat limited	
		Water erosion	0.89	Depth to saturated zone	1.00	percs slowly	0.40
		Restricted permeability	0.43	Water erosion	0.89		
		Depth to saturated zone	0.25	Restricted permeability	0.43		
		Slope	0.04	Slope	0.04		
W:							
Water	100	Not rated		Not rated		Not rated	
WeA:							
Westland	50	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	ponded	1.00
		Water erosion	0.56	Depth to saturated zone	1.00	Frost action	1.00
				Water erosion	0.56	cutbanks cave	0.90
Rensselaer	40	Very Limited		Very Limited		Very limited	
		Depth to saturated zone	1.00	Water erosion	1.00	ponded	1.00
		Water erosion	1.00	Ponding	1.00	Frost action	1.00
				Depth to saturated zone	1.00		

TABLE 28.--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	
AdA:												
Adrian----------	0-26	Muck	PT	A-8	---	---	---	---	---	---	---	---
	26-80	Sand, loamy sand, loamy fine sand	SM, SP	A-1, A-2-4, A-3	0	0	80-100	60-100	35-75	0-30	0-20	NP-5
AkA:												
Alvada----------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-95	50-75	25-40	5-20
	10-39	Clay loam, loam, sandy clay loam	CL, SC	A-2, A-4, A-6, A-7	0	0	85-100	80-100	70-95	30-75	25-45	9-25
	39-46	Gravelly loam, gravelly clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	60-100	60-75	35-70	30-60	25-45	9-25
	46-50	Loam, very gravelly loamy sand, very gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1-b, A-2, A-3, A-4	0	0-5	60-100	30-75	30-70	5-50	0-30	NP-15
	50-80	Loam, clay loam, silty clay loam	CL	A-6, A-7	0-1	0-5	90-100	90-100	80-100	50-90	30-45	10-25
AmA:												
Alvada----------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-95	50-75	25-40	5-20
	11-42	Clay loam, loam, sandy clay loam	CL, SC	A-2, A-4, A-6, A-7	0	0	85-100	80-100	70-95	30-75	25-45	9-25
	42-46	Gravelly loam, gravelly clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	60-100	60-75	35-70	30-60	25-45	9-25
	46-53	Gravelly loamy sand, loam, very gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1-b, A-2, A-3, A-4	0	0-5	60-100	30-75	30-70	5-50	0-30	NP-15
	53-80	Loam, clay loam, silty clay loam	CL	A-6, A-7	0-1	0-5	90-100	90-100	80-100	50-90	30-45	10-25
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
AnA:												
Aquents---------	0-6	Silty clay loam	CL	A-6, A-7	0	0-5	90-100	85-100	75-100	70-95	35-50	15-30
	6-30	Clay loam, silty clay loam, silty clay	CH, CL	A-7, A-6	0	0-5	95-100	85-100	75-100	60-95	35-60	15-35
	30-80	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	75-100	75-100	70-90	30-50	10-30
ApB:												
Arkport---------	0-10	Loamy fine sand	SM, SC	A-2, A-4	0	0	95-100	85-100	65-85	20-45	0-25	NP-10
	10-15	Loamy fine sand	SM, SC	A-2, A-4	0	0	95-100	85-100	70-95	20-45	0-25	NP-10
	15-69	Fine sand, loamy fine sand, fine sandy loam	ML, SM, SC	A-2, A-4	0	0	95-100	85-100	65-95	20-55	0-25	NP-10
	69-80	Sand, fine sand, loamy very fine sand	SM	A-2, A-4	0	0	95-100	85-100	60-95	15-50	0-15	NP-5
ArA:												
Aurand----------	0-11	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	65-100	45-75	20-40	5-20
	11-29	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-2, A-6, A-7	0	0	90-100	80-100	75-95	25-75	25-45	5-25
	29-33	Silty clay loam, loam, sandy loam	CL, SC, CL-ML	A-2, A-4, A-6	0	0-1	90-100	70-100	60-95	30-85	20-45	5-25
	33-48	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	55-95	30-50	10-30
	48-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	55-95	30-50	10-30
AsA:												
Aurand----------	0-10	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	85-100	65-100	45-75	20-40	5-20
	10-26	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-2, A-6, A-7	0	0	90-100	80-100	75-95	25-75	25-45	5-25
	26-35	Silty clay loam, loam, sandy loam	CL, SC, CL-ML	A-2, A-4, A-6	0	0-1	90-100	70-100	60-95	30-85	25-45	5-25
	35-50	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	55-95	30-50	10-30
	50-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	55-95	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 28.--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	
BgA:												
Biglick---------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-75	25-40	5-20
	10-14	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	80-100	75-100	70-95	40-70	20-40
	14-16	Unweathered bedrock			---	---	---	---	---	---	---	---
Milton----------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-75	20-40	5-20
	10-14	Silty clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	20-35
	14-24	Clay, silty clay	CH, CL	A-6, A-7	0	0-3	95-100	80-100	75-95	70-95	40-70	20-40
	24-26	Unweathered bedrock			---	---	---	---	---	---	---	---
BgB:												
Biglick---------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-75	25-40	5-20
	9-13	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0-3	95-100	80-100	75-100	70-95	40-70	20-40
	13-15	Unweathered bedrock			---	---	---	---	---	---	---	---
Milton----------	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-75	20-40	5-20
	8-20	Silty clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	20-35
	20-26	Clay, silty clay	CH, CL	A-7, A-6	0	0-3	95-100	80-100	75-100	70-95	40-70	20-40
	26-28	Unweathered bedrock			---	---	---	---	---	---	---	---
BnA:												
Blount----------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-100	50-70	25-40	5-20
	10-37	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	37-56	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	56-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
BoA:												
Blount----------	0-9	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	90-100	80-95	25-35	5-15
	9-21	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	21-55	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	55-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
BoB:												
Blount----------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	90-100	80-95	25-35	5-15
	8-30	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	30-45	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	45-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30

TABLE 28.--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	
BpA:												
Blount----------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-100	50-70	25-40	5-20
	9-31	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	31-43	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	43-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Houcktown-------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	65-100	50-70	20-30	5-15
	9-28	Clay loam, loam, gravelly sandy clay loam	CL, SC, CL-ML	A-2, A-4, A-6, A-7	0	0-1	95-100	60-100	50-85	25-75	25-45	5-25
	28-52	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-50	10-30
	52-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
BrA:												
Blount----------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-100	50-70	25-40	5-20
	9-26	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	26-52	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	52-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Jenera----------	0-9	Fine sandy loam	SC, SC-SM	A-4, A-6	0	0	100	95-100	65-95	30-45	20-30	5-15
	9-31	Sandy clay loam, clay loam, loam	CL, SC, CL-ML	A-7, A-6, A-4	0	0	100	95-100	75-100	40-80	25-45	5-25
	31-44	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	44-80	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
BuA:												
Blount----------	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	90-100	80-95	25-35	5-15
	10-28	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	28-42	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	42-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
ChC:												
Channahon-------	0-7	Loam	CL, CL-ML	A-4, A-6	0-3	0-10	95-100	75-100	70-90	50-70	25-40	5-20
	7-13	Channery loam, channery clay loam	SC, CL	A-6, A-7, A-2	0-5	5-30	70-95	50-75	30-70	25-50	30-45	10-25
	13-15	Unweathered bedrock			---	---	---	---	---	---	---	---
Biglick---------	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	55-75	25-40	5-20
	7-12	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0-3	95-100	80-100	75-100	70-95	40-70	20-40
	12-14	Unweathered bedrock			---	---	---	---	---	---	---	---
CoA:												
Colwood---------	0-11	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	50-75	15-37	NP-15
	11-56	Loam, clay loam, fine sandy loam	CL, SC, CL-ML	A-4, A-6, A-7	0	0	100	95-100	80-100	35-90	25-45	5-25
	56-80	Stratified fine sand to silt loam	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	70-100	10-80	0-30	NP-10

TABLE 28.--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	
CtA:												
Cygnet----------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-100	70-100	40-70	20-30	5-15
	11-30	Clay loam, loam, gravelly clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7, A-2	0	0	80-100	55-100	50-100	20-70	25-45	5-25
	30-53	Loam, sandy loam, very gravelly loamy coarse sand	CL, ML, SC, SM	A-2, A-4, A-6	0	0	80-100	55-100	45-85	10-65	0-35	NP-15
	53-80	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	45-95	30-50	10-30
CuA:												
Cygnet----------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-100	70-100	40-70	20-30	5-15
	10-42	Clay loam, loam, gravelly clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7, A-2	0	0	80-100	55-100	50-100	20-70	25-45	5-25
	42-57	Loam, sandy loam, very gravelly loamy coarse sand	CL, ML, SC, SM	A-2, A-4, A-6	0	0	80-100	55-100	45-85	10-65	0-35	NP-15
	57-80	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	45-95	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
DbA:												
Darroch---------	0-11	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	55-75	20-30	3-15
	11-44	Clay loam, sandy clay loam, fine sandy loam	CL, SC, SM, CL-ML, ML	A-2-4, A-4, A-6, A-7	0	0	95-100	95-100	80-95	25-75	25-45	3-25
	44-80	Stratified loam to silt loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	75-100	55-100	35-90	0-30	NP-15
DeA:												
Del Rey---------	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-95	20-40	5-20
	10-37	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	90-100	85-95	40-55	16-30
	37-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	75-95	30-45	8-25
DfA:												
Del Rey---------	0-9	Silt loam	CL, CL-ML	A-6	0	0	100	100	90-100	70-95	20-40	5-20
	9-41	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	90-100	85-95	40-55	16-30
	41-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	75-95	30-45	8-25
Blount----------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	90-100	80-95	25-35	5-15
	8-27	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	27-44	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	44-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
DuB:												
Dunbridge-------	0-8	Loamy fine sand	SM, SP-SM	A-2, A-4	0	0-5	90-100	90-100	55-80	10-40	0-15	NP-5
	8-25	Loam, clay loam, gravelly fine sandy loam	CL, ML, SC, SM, CL-ML	A-2, A-4, A-6, A-1-b	0-1	0-5	75-95	50-95	35-90	20-75	20-40	3-20
	25-27	Unweathered bedrock			---	---	---	---	---	---	---	---
EmA:												
Elliott---------	0-12	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	90-100	75-100	25-40	5-20
	12-36	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	75-100	35-60	15-35
	36-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	90-100	85-100	80-100	50-95	30-50	10-30
FbA:												
Flatrock--------	0-9	Loam	CL, CL-ML, ML	A-6, A-4	0	0	100	90-100	80-95	60-75	20-40	3-20
	9-44	Silt loam, loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	60-90	20-45	3-25
	44-80	Stratified gravelly loam to silt loam	CL, ML, SM, CL-ML	A-4, A-6	0	0-5	95-100	60-75	35-70	20-60	20-45	3-25

TABLE 28.--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	
FcA:												
Flatrock--------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	20-40	3-20
	11-52	Silt loam, loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	60-90	20-45	3-25
	52-80	Stratified coarse sandy loam to loam	CL, ML, SM, CL-ML	A-4, A-6	0	0	100	75-100	60-90	30-80	20-45	3-25
FdA:												
Flatrock, limestone substratum-----	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	20-40	3-20
	11-52	Silt loam, loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	60-90	20-45	3-25
	52-64	Stratified coarse sandy loam to loam	CL, ML, SM, CL-ML	A-4, A-6	0	0	100	75-100	60-90	30-80	20-45	3-25
	64-66	Unweathered bedrock			---	---	---	---	---	---	---	---
FoA:												
Fox----------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	75-95	70-90	40-60	20-30	5-18
	9-30	Clay loam, sandy clay loam, gravelly loam	CL, GC, SC, CL-ML	A-2, A-6, A-7, A-4	0-1	0-5	65-100	55-100	30-100	30-80	25-45	5-25
	30-80	Loamy coarse sand, gravelly loamy coarse sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	40-100	35-100	10-75	2-20	0-15	NP-5
FoB:												
Fox----------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	75-95	70-90	40-60	20-30	5-18
	9-37	Clay loam, sandy clay loam, gravelly loam	CL, GC, SC, CL-ML	A-2, A-6, A-7, A-4	0-1	0-5	65-100	55-100	30-100	30-80	25-45	5-25
	37-80	Loamy coarse sand, gravelly loamy coarse sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	40-100	35-100	10-75	2-20	0-15	NP-5
FoC2:												
Fox----------	0-6	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	75-95	70-90	40-60	20-30	5-18
	6-32	Clay loam, sandy clay loam, gravelly loam	CL, GC, SC, CL-ML	A-2, A-4, A-7, A-6	0-1	0-5	65-100	55-100	30-100	30-80	25-45	5-25
	32-80	Loamy coarse sand, gravelly loamy coarse sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	40-100	35-100	10-75	2-20	0-15	NP-5
FsA:												
Fulton----------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	70-90	25-40	5-20
	8-42	Silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	40-70	19-40
	42-60	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	37-70	17-40
	60-80	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	37-70	17-40
FtA:												
Fulton, till substratum-----	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	70-90	25-40	5-20
	10-25	Silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	40-70	19-40
	25-45	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	37-70	17-40
	45-68	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	90-100	85-100	37-70	17-40
	68-80	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	75-100	65-100	45-90	30-50	10-30
GaB:												
Gallman---------	0-10	Loam	CL-ML, CL	A-4, A-6	0	0	90-100	75-100	65-100	40-70	20-35	5-15
	10-61	Loam, gravelly loam, gravelly sandy loam	CL, CL-ML, SC, GC	A-2, A-4, A-6, A-7	0	0	75-100	55-95	40-95	20-70	25-45	5-20
	61-80	Loamy sand, very gravelly sand, gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2, A-3	0	0	60-100	45-95	30-75	5-30	0-25	NP-10

TABLE 28.--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	
GfA:												
Gilford---------	0-12	Mucky loam	CL, CL-ML, SC	A-4, A-6	0	0	95-100	95-100	55-95	45-70	20-30	3-15
	12-27	Loam, sandy loam, fine sandy loam	SC, SM, ML, CL-ML	A-2-4, A-4, A-6	0	0	95-100	95-100	55-85	25-55	20-30	3-15
	27-36	Loamy sand, loamy fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	45-90	4-15	0-25	NP-10
	36-80	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	5-75	0-15	0-25	NP-10
GmA:												
Glynwood, limestone substratum-----	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	50-70	25-40	5-20
	10-31	Clay, clay loam, silty clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	31-40	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	40-61	Clay loam, silty clay loam, loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-45	10-25
	61-63	Unweathered bedrock			---	---	---	---	---	---	---	---
GnB:												
Glynwood--------	0-9	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-90	25-40	5-20
	9-37	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	37-47	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	47-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
GpB2:												
Glynwood--------	0-7	Silty clay loam	CL	A-6, A-7	0	0-2	95-100	90-100	80-100	70-95	35-50	15-30
	7-31	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	31-40	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	40-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
GpC2:												
Glynwood--------	0-6	Silty clay loam	CL	A-6, A-7	0	0-2	95-100	90-100	80-100	70-95	30-50	15-30
	6-32	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	32-41	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	41-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
GsB:												
Glynwood--------	0-7	Clay loam	CL	A-6, A-7	0	0-2	95-100	90-100	80-100	65-85	30-50	15-30
	7-36	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	36-47	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	47-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Blount----------	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-100	50-70	25-40	5-15
	8-32	Clay loam, silty clay, silty clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	70-90	60-90	35-55	15-35
	32-44	Silty clay loam, clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	44-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30

TABLE 28.--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	
Houcktown-------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	65-100	50-70	20-30	5-15
	9-37	Loam, clay loam, gravelly sandy clay loam	CL, SC	A-2, A-4, A-6, A-7	0	0-1	95-100	60-100	50-85	25-75	25-45	5-25
	37-45	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-50	10-30
	45-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
GuB:												
Glynwood--------	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-90	25-40	5-20
	10-36	Silty clay, silty clay loam, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	36-49	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	49-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
HaA:												
Harrod----------	0-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	85-100	70-90	25-40	5-20
	13-33	Silt loam, loam, clay loam	CL, CL-ML	A-7, A-4, A-6	0	0	95-100	75-100	65-100	40-90	25-45	5-25
	33-35	Unweathered bedrock			---	---	---	---	---	---	---	---
HkA:												
Haskins---------	0-11	Fine sandy loam	ML, SM, CL, CL-ML	A-2, A-4, A-6	0	0	95-100	85-100	55-85	25-50	20-30	3-15
	11-37	Clay loam, sandy clay loam, loam	CL, SC, CL-ML	A-2, A-4, A-6, A-7	0	0	85-100	70-100	55-85	30-65	25-45	5-25
	37-54	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
	54-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
HnA:												
Haskins---------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	70-100	50-70	20-30	5-15
	9-36	Clay loam, sandy clay loam, loam	CL, SC, CL-ML	A-2, A-4, A-6, A-7	0	0	85-100	70-100	55-85	30-65	25-45	5-25
	36-52	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
	52-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
HpA:												
Houcktown-------	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	65-100	50-70	20-30	5-15
	8-35	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-4, A-6, A-7, A-2	0	0-1	95-100	60-100	50-85	25-75	25-45	5-25
	35-51	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-50	10-30
	51-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
HpB:												
Houcktown-------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	65-100	50-70	20-30	5-15
	10-30	Loam, sandy clay loam, clay loam	CL, SC, CL-ML	A-2, A-4, A-6, A-7	0	0-1	95-100	60-100	50-85	25-75	25-45	5-25
	30-50	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-50	10-30
	50-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
HrB:												
Houcktown-------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	65-100	50-70	20-30	5-15
	9-21	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-2, A-4, A-6, A-7	0	0-1	95-100	60-100	50-85	25-75	25-45	5-25
	21-45	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-50	10-30
	45-80	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25

TABLE 28.--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	
Glynwood--------	0-7	Clay loam	CL	A-7, A-6	0	0-2	95-100	90-100	80-100	65-85	35-50	15-30
	7-36	Silty clay loam, silty clay, clay	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	65-95	35-55	15-35
	36-47	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	47-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
Jenera----------	0-8	Fine sandy loam	SC, SC-SM	A-4, A-6	0	0	100	95-100	65-95	30-45	20-30	5-15
	8-47	Sandy clay loam, clay loam, loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	100	95-100	75-100	40-80	25-45	5-25
	47-58	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	58-80	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
HsA:												
Hoytville-------	0-9	Silty clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	35-50	15-25
	9-41	Clay, silty clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	75-95	35-60	15-35
	41-60	Clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0-5	95-100	85-100	80-100	60-95	35-60	15-35
	60-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
HtA:												
Hoytville-------	0-8	Silty clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	35-60	15-30
	8-41	Clay, silty clay	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	75-95	35-60	15-35
	41-64	Clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0-5	95-100	85-100	80-100	60-95	35-60	15-35
	64-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	80-100	50-95	30-50	10-30
JeA:												
Jenera----------	0-10	Fine sandy loam	SC, SC-SM	A-4, A-6	0	0	100	95-100	65-95	30-45	20-30	5-15
	10-37	Sandy clay loam, clay loam, loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	100	95-100	75-100	40-80	25-45	5-25
	37-50	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	50-80	Clay loam, silty clay loam, loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
JeB:												
Jenera----------	0-8	Fine sandy loam	SC-SM, SC	A-4, A-6	0	0	100	95-100	65-95	30-45	20-30	5-15
	8-47	Sandy clay loam, clay loam, loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	100	95-100	75-100	40-80	25-45	5-25
	47-58	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	58-80	Clay loam, silty clay loam, loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	50-90	30-45	10-25
JfB:												
Jenera----------	0-9	Fine sandy loam	SC, SC-SM	A-4, A-6	0	0	100	95-100	65-95	30-45	20-30	5-15
	9-21	Sandy clay loam, clay loam, loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	100	95-100	75-100	40-80	25-45	5-25
	21-59	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	59-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	90-100	65-95	50-90	30-50	10-30
Shinrock, till substratum-----	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	70-90	25-40	5-20
	8-24	Silty clay loam, silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-95	40-55	20-30
	24-40	Silty clay loam, silt loam, silt	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-100	15-50	2-30
	40-67	Stratified very fine sand to silty clay loam	CL, ML, SC, SM, CL-ML	A-4, A-6, A-7	0	0	100	100	75-100	40-95	15-50	2-30
	67-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	90-100	65-95	45-90	30-50	10-30

TABLE 28.--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	
JoA:												
Joliet----------	0-9	Loam	CL	A-6	0-1	0-5	90-100	75-100	65-100	40-75	30-40	10-20
	9-18	Fine sandy loam, clay loam, silty clay loam	CL, CL-ML	A-6, A-4, A-7	0-1	0-10	90-100	75-100	65-100	30-85	20-45	5-20
	18-20	Unweathered bedrock			---	---	---	---	---	---	---	---
KnA:												
Knoxdale--------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	70-90	20-40	3-20
	11-47	Silt loam, loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	95-100	85-100	55-90	20-45	3-25
	47-80	Stratified sandy loam to silt loam	CL, CL-ML, ML, SM	A-4, A-6	0	0	100	75-100	60-90	35-80	20-45	3-20
LbA:												
Lamberjack------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-95	70-90	40-70	20-40	5-20
	11-39	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-6, A-7	0	0	85-100	75-95	55-85	35-70	25-45	5-25
	39-44	Gravelly loam, gravelly clay loam, gravelly sandy loam	CL, SC, CL-ML	A-1-b, A-2, A-4, A-6	0	0	80-100	50-75	30-70	15-60	20-45	5-25
	44-62	Gravelly loamy coarse sand, very gravelly loamy coarse sand, gravelly coarse sandy loam	SM, SP-SM, SW-SM	A-1, A-2, A-3	0	0-1	80-100	25-75	20-60	5-30	0-25	NP-10
	62-80	Silt loam, silty clay loam, loam	CL	A-6, A-7	0-1	0-5	90-100	90-100	80-100	50-90	30-45	10-25
LcA:												
Lamberjack------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-95	70-90	40-70	20-40	5-20
	11-36	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-6, A-7	0	0	85-100	75-95	55-85	35-70	25-45	5-25
	36-45	Gravelly loam, gravelly clay loam, gravelly sandy loam	CL, SC, CL-ML	A-1-b, A-2, A-4, A-6	0	0	80-100	50-75	30-70	15-60	20-45	5-25
	45-60	Very gravelly loamy coarse sand, gravelly coarse sandy loam, gravelly loamy coarse sand	SM, SP-SM, SW-SM	A-1, A-2, A-3	0	0-1	80-100	25-75	20-60	5-30	0-25	NP-10
	60-80	Silt loam, silty clay loam, loam	CL	A-6, A-7	0-1	0-5	90-100	90-100	80-100	50-90	30-45	10-25
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
LuB2:												
Lucas----------	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-50	10-30
	7-23	Silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-100	40-70	19-40
	23-42	Silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-100	37-70	17-40
	42-80	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	95-100	80-100	37-70	17-40
LyE:												
Lybrand---------	0-8	Silt loam	CL, CL-ML	A-6, A-4	0	0-5	95-100	85-100	75-100	70-90	25-40	5-20
	8-29	Silty clay loam, silty clay, clay loam	CH, CL	A-7, A-6	0-1	0-5	95-100	85-100	85-95	65-95	35-55	15-35
	29-47	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
	47-80	Silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
MbA:												
Medway----------	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	75-100	70-100	70-90	25-40	3-20
	12-50	Loam, silt loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	75-100	75-95	45-90	25-45	3-25
	50-66	Stratified gravelly sandy loam to loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	90-100	60-100	45-95	25-75	15-40	NP-20
	66-80	Stratified loam to loamy coarse sand to gravelly sandy loam	CL, ML, SC, SM	A-1-b, A-2, A-4, A-6	0	0-5	65-100	50-100	30-95	10-75	15-40	NP-20

TABLE 28.--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	
McA:												
Medway, limestone substratum-----	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	75-100	70-100	70-90	25-40	3-20
	10-55	Loam, silt loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	75-100	75-95	45-90	25-45	3-25
	55-72	Stratified very cobbly sandy loam to loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-1-b	0	0-50	75-100	35-100	30-90	10-75	15-40	NP-20
	72-74	Unweathered bedrock			---	---	---	---	---	---	---	---
MeA:												
Mermill---------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-70	20-40	5-20
	9-28	Clay loam, sandy clay loam, loam	CL, SC, CL-ML	A-4, A-6, A-7	0	0	90-100	85-100	70-85	40-75	25-45	5-25
	28-57	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	50-95	30-50	10-30
	57-80	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	50-95	30-50	10-30
MfA:												
Mermill---------	0-8	Clay loam	CL	A-6, A-7	0	0	95-100	85-100	80-100	50-80	35-45	15-25
	8-30	Clay loam, sandy clay loam, loam	CL, SC, CL-ML	A-4, A-6, A-7	0	0	90-100	85-100	70-85	40-75	25-45	5-25
	30-47	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	50-95	30-50	10-30
	47-80	Clay, silty clay, clay loam	CL	A-6, A-7	0	0-2	95-100	85-100	75-100	50-95	30-50	10-30
MgA:												
Millsdale-------	0-13	Silty clay loam	CL	A-6	0	0	90-100	75-100	65-100	60-95	35-45	15-25
	13-35	Silty clay, silty clay loam, clay loam	CL, CH	A-7, A-6	0	0-5	85-100	75-100	65-100	55-95	40-55	20-35
	35-37	Unweathered bedrock			---	---	---	---	---	---	---	---
MnA:												
Milton----------	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	20-40	5-20
	10-21	Silty clay loam, clay loam, clay	CL, CH	A-6, A-7	0	0	95-100	80-100	75-100	60-95	40-60	20-35
	21-29	Clay, silty clay	CH, CL	A-7, A-6	0	0-3	95-100	80-100	75-100	70-95	40-70	20-40
	29-31	Unweathered bedrock			---	---	---	---	---	---	---	---
MpD3:												
Morley----------	0-6	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-100	60-85	35-50	15-35
	6-14	Silty clay, clay loam, clay	CH, CL	A-7, A-6	0-1	0-5	95-100	75-100	70-95	65-90	35-55	15-35
	14-39	Silty clay loam, clay loam, clay	CL	A-7, A-6	0-1	0-5	95-100	75-100	70-95	65-90	30-50	10-30
	39-80	Clay loam, silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	45-90	30-50	10-30
MrA:												
Morley, limestone substratum-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-70	25-40	5-20
	8-24	Clay loam, clay, silty clay loam	CL	A-7, A-6	0	0	95-100	75-100	65-95	60-85	35-55	15-30
	24-45	Clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	75-100	65-95	45-90	35-50	15-30
	45-66	Loam, clay loam, silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-100	65-95	45-90	30-45	10-25
	66-68	Unweathered bedrock			---	---	---	---	---	---	---	---

TABLE 28.--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	
MsB:												
Morley, limestone substratum-----	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-70	25-40	5-20
	9-34	Clay loam, clay, silty clay loam	CL	A-7, A-6	0	0	95-100	75-100	65-95	60-85	35-55	15-30
	34-42	Clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	75-100	65-95	45-90	35-50	15-30
	42-61	Loam, clay loam, silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	75-100	65-95	45-90	30-45	10-25
	61-63	Unweathered bedrock			---	---	---	---	---	---	---	---
Milton----------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	20-40	5-20
	8-27	Silty clay loam, clay loam, clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	60-95	40-60	20-35
	27-29	Clay, silty clay	CH, CL	A-7, A-6	0	0-3	95-100	80-100	75-100	70-95	40-70	20-40
	29-31	Unweathered bedrock			---	---	---	---	---	---	---	---
MvB:												
Mortimer--------	0-8	Silt loam	CL	A-6	0	0	95-100	90-100	85-100	70-90	30-40	10-20
	8-39	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40
	39-49	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40
	49-80	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40
MwB2:												
Mortimer--------	0-7	Silty clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	35-50	15-30
	7-39	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40
	39-52	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40
	52-80	Silty clay, clay	CH, CL	A-7	0	0-5	95-100	90-100	85-100	80-95	45-70	20-40

TABLE 28.--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	
NnA:												
Nappanee--------	0-8	Loam	CL	A-6, A-4	0	0-5	95-100	90-100	85-100	55-70	30-40	5-20
	8-34	Silty clay, clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	40-70	20-40
	34-56	Silty clay, clay, clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	70-95	30-50	10-30
	56-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	50-95	30-50	10-30
NnB:												
Nappanee--------	0-8	Loam	CL	A-6, A-4	0	0-5	95-100	90-100	85-100	55-70	30-40	5-20
	8-31	Silty clay, clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	40-70	20-40
	31-46	Silty clay, clay, clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	70-95	30-50	10-30
	46-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	50-95	30-50	10-30
NpA:												
Nappanee--------	0-8	Silty clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	30-50	15-30
	8-40	Silty clay, clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	40-70	20-40
	40-56	Silty clay, clay, clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	70-95	30-50	10-30
	56-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	50-95	30-50	10-30
NpB2:												
Nappanee--------	0-7	Silty clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	75-95	30-50	15-30
	7-32	Silty clay, clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	40-70	20-40
	32-40	Silty clay, clay, clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	70-95	30-50	10-30
	40-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	50-95	30-50	10-30
NrA:												
Nappanee--------	0-8	Loam	CL	A-6, A-4	0	0-5	95-100	90-100	85-100	55-70	30-40	5-20
	8-34	Silty clay, clay	CH, CL	A-7, A-6	0	0-5	95-100	90-100	85-100	80-95	40-70	20-40
	34-49	Silty clay, clay, clay loam	CL	A-7, A-6	0	0-5	95-100	90-100	85-100	70-95	30-50	10-30
	49-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	50-95	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
OrA:												
Oshtemo---------	0-9	Fine sandy loam	SM	A-2, A-4	0	0	95-100	75-95	60-70	25-40	0-25	NP-5
	9-29	Fine sandy loam, sandy clay loam, gravelly coarse sandy loam	CL-ML, SC, CL	A-2, A-4	0	0	95-100	55-95	35-85	15-50	20-30	5-15
	29-52	Loamy sand, sandy loam, gravelly sandy loam	SM, SP-SM	A-2, A-1-b	0	0	85-95	55-95	30-70	10-30	0-25	NP-10
	52-80	Stratified coarse sand to gravelly loamy coarse sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	65-95	55-90	20-60	0-15	0-25	NP-5
OrB:												
Oshtemo---------	0-10	Fine sandy loam	SM	A-2, A-4	0	0	95-100	75-95	60-70	25-40	0-25	NP-5
	10-27	Fine sandy loam, sandy clay loam, gravelly coarse sandy loam	CL, CL-ML, SC	A-4, A-2	0	0	95-100	55-95	35-85	15-50	20-30	5-15
	27-43	Loamy sand, sandy loam, gravelly sandy loam	SM, SP-SM	A-2, A-1-b	0	0	85-95	55-95	30-70	10-30	0-25	NP-10
	43-80	Stratified coarse sand to gravelly loamy coarse sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	65-95	55-90	20-60	0-15	0-25	NP-5

TABLE 28.--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	
OrC:												
Oshtemo---------	0-8	Fine sandy loam	SM	A-2, A-4	0	0	95-100	75-95	60-70	25-40	0-25	NP-5
	8-25	Fine sandy loam, sandy clay loam, gravelly coarse sandy loam	CL, CL-ML, SC	A-2, A-4	0	0	95-100	55-95	35-85	15-50	20-30	5-15
	25-52	Loamy sand, sandy loam, gravelly sandy loam	SM, SP-SM	A-2, A-1-b	0	0	85-95	55-95	30-70	10-30	0-25	NP-10
	52-80	Stratified coarse sand to gravelly loamy coarse sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	65-95	55-90	20-60	0-15	0-25	NP-5
OsB:												
Oshtemo, till substratum-----	0-11	Sandy loam	SM	A-2, A-4	0	0	95-100	75-95	55-70	25-40	0-25	NP-10
	11-34	Sandy loam, sandy clay loam, gravelly sandy loam	CL, CL-ML, SC	A-2, A-4	0	0	95-100	55-95	35-85	15-50	20-30	5-15
	34-44	Loamy sand, sandy loam, gravelly sandy loam	SM, SP-SM	A-2, A-1-b	0	0	85-95	55-95	30-70	10-30	0-25	NP-10
	44-75	Loamy sand, loamy coarse sand, gravelly loamy coarse sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	65-95	55-90	20-60	0-15	0-25	NP-5
	75-80	Clay, silty clay loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	45-95	30-50	10-30
OwB:												
Ottokee---------	0-11	Loamy fine sand	SM	A-2, A-4	0	0	100	90-100	65-80	15-45	0-20	NP-5
	11-65	Loamy fine sand, sand, loamy sand	SM	A-2	0	0	100	90-100	65-80	20-35	0-20	NP-5
	65-80	Loamy fine sand, sand, loamy sand	SM, SW-SM	A-2, A-3	0	0	100	90-100	70-80	5-25	0-15	NP-5
PbA:												
Patton----------	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	90-100	85-100	80-95	30-45	10-25
	12-48	Silty clay loam	CL	A-7, A-6	0	0	100	90-100	85-100	80-100	30-45	10-25
	48-80	Stratified silt loam to silty clay loam	CL	A-6, A-7	0	0	100	90-100	85-100	75-95	30-45	10-25
PmA:												
Pewamo----------	0-11	Silty clay loam	CL	A-6, A-7	0	0-5	90-100	85-100	75-100	70-95	35-50	15-30
	11-53	Clay loam, clay, silty clay	CH, CL	A-7, A-6	0	0-5	95-100	85-100	75-100	60-95	35-60	15-35
	53-80	Clay loam, silty clay loam	CL	A-7, A-6	0	0-5	95-100	75-100	75-100	45-90	30-50	10-30
PnA:												
Pewamo----------	0-10	Silty clay loam	CL	A-6, A-7	0	0-5	90-100	85-100	75-100	70-95	35-50	15-30
	10-52	Clay loam, clay, silty clay	CH, CL	A-7, A-6	0	0-5	95-100	85-100	75-100	60-95	35-60	15-35
	52-80	Clay loam, silty clay loam	CL	A-7, A-6	0	0-5	95-100	75-100	75-100	45-90	30-50	10-30
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---
Pt:												
Pits----------	---	---	---	---	---	---	---	---	---	---	---	---
RcA:												
Randolph--------	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	75-85	25-40	5-20
	11-25	Silty clay loam, silty clay, clay loam	CH, CL	A-6, A-7	0-1	0-5	80-100	75-100	75-95	60-85	40-60	20-35
	25-27	Unweathered bedrock			---	---	---	---	---	---	---	---
RgB:												
Rawson----------	0-19	Sandy loam	ML, SM	A-2-4, A-4	0	0	90-100	75-100	50-85	25-50	0-30	NP-15
	19-32	Clay loam, sandy loam, gravelly sandy clay loam	CL, GC, SC	A-2-4, A-4, A-6, A-7	0	0	65-100	60-95	45-90	25-75	25-45	5-25
	32-36	Clay loam, clay, silty clay loam	CL, CH	A-6, A-7	0	0	90-100	85-100	80-100	45-95	30-60	10-35
	36-60	Clay loam, clay, silty clay loam	CL	A-6, A-7	0	0	90-100	85-100	80-100	45-95	30-50	10-30

TABLE 28.--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	
RhA:												
Rensselaer, till substratum-----	0-12	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	50-70	20-40	5-20
	12-46	Loam, clay loam, silty clay loam	CL, CL-ML	A-6, A-7	0	0	95-100	90-100	80-100	50-90	25-45	5-25
	46-54	Fine sandy loam, loam, sandy loam	CL, SC	A-6, A-4	0	0	95-100	90-100	70-100	35-75	25-40	5-20
	54-63	Stratified loamy sand to silt loam	CL-ML, ML, SC, SM	A-2, A-4, A-6	0	0	95-100	85-100	70-85	10-80	0-30	NP-15
	63-80	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	50-95	30-50	10-30
RnA:												
Rimer----------	0-10	Loamy sand	SM, SC	A-1, A-2, A-2-4	0	0	100	95-100	45-80	15-30	0-25	NP-10
	10-23	Loamy fine sand, loamy sand	SM, SC	A-2, A-2-4	0	0	100	95-100	75-90	20-30	0-25	NP-10
	23-28	Fine sandy loam, sandy loam	SC, SM	A-4	0	0	100	95-100	60-80	35-45	0-30	NP-15
	28-54	Clay, silty clay, silty clay loam	CL, CH	A-6, A-7	0	0-5	95-100	85-100	85-100	45-95	30-55	10-30
	54-80	Clay, silty clay, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	85-100	45-95	30-50	10-30
RoA:												
Rimer, deep phase----------	0-11	Loamy fine sand	SC, SM	A-1, A-2, A-2-4	0	0	100	95-100	45-80	15-30	0-25	NP-10
	11-24	Loamy fine sand, loamy sand	SC, SM	A-2, A-2-4	0	0	100	95-100	75-90	20-30	0-25	NP-10
	24-45	Fine sandy loam, sandy loam	SC, SM	A-4	0	0	100	95-100	60-80	35-45	0-30	NP-15
	45-52	Loamy sand	SC, SM	A-2, A-2-4, A-1	0	0	100	95-100	45-90	20-30	0-25	NP-10
	52-80	Loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	85-100	50-95	30-45	10-25
RtA:												
Rossburg--------	0-13	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	60-90	20-40	5-20
	13-56	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	70-95	50-80	25-40	5-20
	56-80	Stratified gravelly sandy loam to loam	CL, ML, SC, SM	A-2-4, A-4	0	0	80-100	50-100	45-90	25-65	0-25	NP-10
SeA:												
Shawtown--------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-100	70-90	40-75	20-40	5-20
	9-53	Loam, clay loam, gravelly loam	CL, SC, CL-ML	A-1-b, A-2, A-4, A-6, A-7	0	0-1	80-100	60-95	35-80	15-60	25-45	5-25
	53-66	Gravelly loamy coarse sand, loamy sand, very gravelly sandy loam	SC, SM, SP-SM	A-1-b, A-2	0	0-1	80-100	40-95	25-80	10-35	0-25	NP-10
	66-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	45-95	30-50	10-30
SeB:												
Shawtown--------	0-9	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	75-100	70-90	40-75	20-40	5-20
	9-55	Loam, clay loam, gravelly loam	CL, SC, CL-ML	A-1-b, A-2, A-4, A-6, A-7	0	0-1	80-100	60-95	35-80	15-60	25-45	5-25
	55-63	Gravelly loamy coarse sand, loamy sand, very gravelly sandy loam	SC, SM, SP-SM	A-1-b, A-2	0	0-1	80-100	40-95	25-80	10-35	0-25	NP-10
	63-80	Clay loam, silty clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	45-95	30-50	10-30
SfB:												
Shinrock--------	0-8	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	85-100	70-90	25-40	5-20
	8-36	Silty clay loam, silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-95	40-55	20-30
	36-50	Silty clay loam, silt loam, silt	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-100	15-50	2-30
	50-80	Stratified very fine sand to silty clay loam	CL, ML, SC, SM, CL-ML	A-4, A-6, A-7	0	0	100	100	75-100	40-95	15-50	2-30

TABLE 28.--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	
SgC2:												
Shinrock--------	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	75-95	35-50	15-30
	7-34	Silty clay loam, silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-95	40-55	20-30
	34-51	Silty clay loam, silt loam, silt	CL, ML, CL-ML	A-6, A-7, A-4	0	0	100	100	90-100	75-100	15-50	2-30
	51-80	Stratified very fine sand to silty clay loam	CL, ML, SC, SM, CL-ML	A-4, A-6, A-7	0	0	100	100	75-100	40-95	15-50	2-30
SkB:												
Shinrock, till substratum-----	0-10	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	85-100	70-90	25-40	5-20
	10-26	Silty clay loam, silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-95	40-55	20-30
	26-43	Silty clay loam, silt loam, silt	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-100	15-50	2-30
	43-62	Stratified very fine sand to silty clay loam	CL, ML, SC, SM, CL-ML	A-4, A-6, A-7	0	0	100	100	75-100	40-95	15-50	2-30
	62-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	90-100	65-95	50-90	30-50	10-30
Glynwood--------	0-8	Silty clay loam	CL	A-6, A-7	0	0-2	95-100	90-100	80-100	70-95	35-50	15-30
	8-26	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0-1	0-5	95-100	85-100	75-100	60-95	35-55	15-35
	26-39	Clay loam, silty clay loam, silty clay	CL	A-6, A-7	0-1	0-5	95-100	80-95	65-95	45-90	30-50	10-30
	39-80	Clay loam, silty clay loam	CL	A-7, A-6	0-1	0-5	95-100	75-95	65-95	45-90	30-50	10-30
SmA:												
Shoals----------	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	65-90	25-40	5-20
	11-59	Silt loam, loam, silty clay loam, clay loam	CL, CL-ML	A-6, A-4, A-7	0	0	100	90-100	90-100	75-85	25-45	5-25
	59-80	Stratified sandy loam to loam	CL-ML, ML, SM, CL	A-4	0	0-3	90-100	75-100	50-100	25-75	0-35	NP-15
SnA:												
Sloan----------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	85-100	55-75	20-40	5-20
	11-46	Loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	90-100	85-100	50-95	30-45	5-25
	46-80	Stratified sandy loam to gravelly silty clay loam	CL, ML	A-4, A-6	0	0	85-100	70-100	45-95	30-90	23-35	3-15
SoA:												
Sloan----------	0-11	Silty clay loam	CL	A-6, A-7	0	0	100	90-100	90-100	80-95	35-45	15-25
	11-58	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	90-100	85-100	50-95	30-45	5-25
	58-80	Stratified loam to silty clay loam	CL, ML	A-4, A-6	0	0	85-100	70-100	45-95	30-90	23-35	3-15
SpA:												
Sloan, limestone substratum-----	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	90-100	90-100	80-95	35-45	15-25
	10-39	Silty clay loam, clay loam, silt loam	CL	A-4, A-6, A-7	0	0	100	90-100	85-100	50-95	30-45	5-25
	39-71	Stratified loam to silty clay loam	CL, ML	A-4, A-6	0	0	85-100	70-100	45-95	30-90	23-35	3-15
	71-73	Unweathered bedrock			---	---	---	---	---	---	---	---
StB2:												
St. Clair-------	0-4	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-100	75-95	35-50	15-30
	4-37	Clay, silty clay	CH, CL	A-7	0	0-5	95-100	90-100	75-100	70-95	45-70	20-40
	37-48	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0-5	95-100	75-100	70-100	60-95	40-60	20-35
	48-80	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0-5	95-100	75-100	70-100	60-95	40-60	20-35

TABLE 28.--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	
StC2:												
St. Clair-------	0-6	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-100	75-95	35-50	15-30
	6-35	Clay, silty clay	CH, CL	A-7	0	0-5	95-100	90-100	75-100	70-95	45-70	20-40
	35-42	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0-5	95-100	75-100	70-100	60-95	40-60	20-35
	42-80	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0-5	95-100	75-100	70-100	60-95	40-60	20-35
ThA:												
Thackery, till substratum-----	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	80-95	55-75	25-40	5-20
	10-25	Loam, clay loam	CL	A-7, A-6	0	0	100	80-100	80-95	55-75	30-45	10-25
	25-56	Loam, sandy clay loam, gravelly clay loam	CL, SC	A-7, A-6, A-2	0	0-1	80-100	60-95	60-85	30-75	30-45	10-25
	56-69	Loamy sand, very gravelly sand, gravelly loamy coarse sand	SM	A-1, A-2-4	0	0-1	80-100	55-75	25-65	5-15	0-25	NP-5
	69-80	Loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	50-90	30-45	10-25
TkA:												
Tiderishi-------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	75-95	55-75	20-35	5-15
	11-42	Loam, clay loam, sandy clay loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	90-100	85-100	70-85	35-75	25-45	5-25
	42-57	Silt loam, fine sandy loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	60-90	35-85	20-45	5-25
	57-80	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	50-90	30-45	10-25
TnA:												
Toledo----------	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	35-50	15-30
	9-50	Silty clay, clay	CH, CL	A-7, A-6	0	0	100	100	95-100	80-100	40-70	19-40
	50-80	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6	0	0	100	100	95-100	80-100	37-70	17-40
ToB:												
Tuscola---------	0-10	Loamy fine sand	SC, SM	A-1, A-2-4	0	0	100	100	45-90	15-30	0-25	NP-10
	10-55	Fine sandy loam, loam, sandy clay loam	CL, CL-ML, SC	A-4, A-6	0	0	100	100	80-95	40-90	25-45	5-25
	55-80	Stratified loamy coarse sand to silt loam	ML, SM, SC	A-6, A-4, A-2	0	0	85-100	80-100	70-90	10-75	0-45	NP-25
TpA:												
Tuscola---------	0-8	Fine sandy loam	ML, SC, SM	A-2, A-4	0	0	100	100	60-95	30-50	15-25	3-10
	8-40	Clay loam, loam, fine sandy loam	CL, CL-ML, SC	A-4, A-6	0	0	100	100	80-95	40-90	20-45	5-25
	40-80	Stratified fine sand to silt loam	ML, SM	A-6, A-4, A-2	0	0	100	100	75-90	10-90	0-45	NP-25
TpB:												
Tuscola---------	0-11	Fine sandy loam	ML, SC, SM	A-2, A-4	0	0	100	100	60-95	30-50	15-25	3-10
	11-44	Clay loam, loam, fine sandy loam	CL, CL-ML, SC	A-4, A-6	0	0	100	100	80-95	40-90	20-45	5-25
	44-80	Stratified fine sand to silt loam	ML, SM	A-6, A-4, A-2	0	0	100	100	75-90	10-90	0-45	NP-25
TuB:												
Tuscola---------	0-9	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	85-100	60-90	15-25	3-10
	9-43	Silty clay loam, loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	80-95	50-90	20-45	5-25
	43-80	Stratified fine sand to silt loam	ML, SM	A-6, A-4, A-2	0	0	100	100	75-90	10-90	0-45	NP-25
UcA:												
Udorthents------	---	---	---	---	---	---	---	---	---	---	---	---
UcD:												
Udorthents------	---	---	---	---	---	---	---	---	---	---	---	---
Ur:												
Urban Land------	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 28.--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	
VaA:												
Vanlue----------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	80-95	55-70	20-35	5-15
	10-35	Clay loam, loam, sandy clay loam	CL, SC, CL-ML	A-6, A-7, A-4	0	0	100	90-100	85-100	45-80	25-45	5-25
	35-59	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-45	5-25
	59-80	Clay loam, silty clay loam, loam	CL	A-6, A-7	0	0-3	95-100	90-100	75-95	50-95	30-45	10-25
VeA:												
Vaughnsville----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	75-100	65-95	50-75	25-40	5-20
	8-20	Clay loam, sandy clay loam, loam	CL, SC, CL-ML	A-4, A-6, A-7	0	0	90-100	80-100	65-90	35-70	25-45	5-25
	20-36	Sandy loam, loam, gravelly sandy clay loam	CL, CL-ML, ML, SM	A-2, A-4, A-6	0	0	80-100	65-100	60-80	30-65	0-40	NP-20
	36-45	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0-5	90-100	90-100	75-100	45-95	30-50	10-30
	45-80	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0-5	90-100	90-100	75-100	45-95	30-50	10-30
W:												
Water----------	---	---	---	---	---	---	---	---	---	---	---	---
WeA:												
Westland--------	0-10	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	90-100	75-100	55-75	20-40	5-20
	10-52	Clay loam, loam, sandy clay loam	CL, SC	A-6, A-7	0	0-5	80-100	75-95	65-90	45-70	30-45	10-25
	52-59	Clay loam, loam, gravelly sandy loam	CL, ML, SC, SM	A-2-4, A-4, A-6	0	0-5	55-100	50-95	25-85	15-70	10-40	NP-20
	59-80	Loamy coarse sand, very gravelly coarse sand, gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-1-b	0	0-12	40-75	35-75	10-45	0-10	0-25	NP-5
Rensselaer------	0-19	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	50-70	25-40	5-20
	19-38	Loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	50-90	30-45	10-25
	38-58	Fine sandy loam, loam, sandy clay loam	CL, SC	A-6, A-4	0	0	95-100	85-100	70-100	35-75	25-45	5-25
	58-80	Stratified sand to silt loam	CL-ML, ML, SC, SM	A-2, A-4, A-6	0	0	95-100	85-100	70-85	10-80	0-30	NP-15

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
AdA:										
Adrian----------	0-26	0-0	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	2	2
	26-80	2-10	1.40-1.75	6.00-20.00	0.03-0.08	Low	.15	.15		
AkA:										
Alvada----------	0-10	18-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.24	.28	5	6
	10-39	18-35	1.35-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	39-46	18-32	1.40-1.60	0.60-2.00	0.08-0.15	Low	.24	.28		
	46-50	5-18	1.50-1.70	2.00-6.00	0.08-0.12	Low	.24	.28		
	50-80	22-35	1.60-1.80	0.06-0.60	0.05-0.10	Moderate	.32	.32		
AmA:										
Alvada----------	0-11	18-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.24	.28	5	6
	11-42	18-35	1.35-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	42-46	18-32	1.40-1.60	0.60-2.00	0.08-0.15	Low	.24	.28		
	46-53	5-18	1.50-1.70	2.00-6.00	0.08-0.12	Low	.24	.28		
	53-80	22-35	1.60-1.80	0.06-0.60	0.05-0.10	Moderate	.32	.32		
Urban land------	---	---	---	---	---	---	---	---	-	---
AnA:										
Aquents---------	0-6	27-40	1.35-1.55	0.60-2.00	0.10-0.20	Moderate	.28	.28	-	7
	6-30	35-45	1.40-1.70	0.20-0.60	0.08-0.13	Moderate	.32	.32		
	30-80	27-40	1.50-1.70	0.20-0.60	0.05-0.10	Moderate	.37	.37		
ApB:										
Arkport---------	0-10	5-15	1.10-1.40	2.00-6.00	0.09-0.12	Low	.17	.17	5	2
	10-15	3-15	1.25-1.55	2.00-6.00	0.06-0.16	Low	.28	.28		
	15-69	1-15	1.25-1.55	2.00-6.00	0.06-0.12	Low	.28	.28		
	69-80	1-5	1.25-1.55	2.00-6.00	0.02-0.06	Low	.28	.28		
ArA:										
Aurand----------	0-11	12-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.28	4	5
	11-29	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.24	.28		
	29-33	15-35	1.30-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	33-48	27-42	1.40-1.80	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	48-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
AsA:										
Aurand----------	0-10	12-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.28	4	5
	10-26	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.24	.28		
	26-35	15-35	1.30-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	35-50	27-42	1.40-1.80	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	50-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
BgA:										
Biglick---------	0-10	20-27	1.30-1.55	0.60-2.00	0.15-0.23	Low	.32	.32	1	6
	10-14	35-60	1.45-1.65	0.06-0.60	0.12-0.18	Moderate	.24	.32		
	14-16	---	---	0.00-0.60	---	---	---	---		
Milton----------	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	10-14	35-50	1.45-1.65	0.20-0.60	0.12-0.18	Moderate	.32	.37		
	14-24	40-60	1.40-1.70	0.20-0.60	0.12-0.16	Moderate	.32	.37		
	24-26	---	---	0.00-0.60	---	---	---	---		
BgB:										
Biglick---------	0-9	20-27	1.30-1.55	0.60-2.00	0.15-0.23	Low	.32	.32	1	6
	9-13	35-60	1.45-1.65	0.06-0.60	0.12-0.18	Moderate	.24	.32		
	13-15	---	---	0.00-0.60	---	---	---	---		
Milton----------	0-8	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	8-20	35-50	1.45-1.65	0.20-0.60	0.12-0.18	Moderate	.32	.37		
	20-26	40-60	1.40-1.70	0.20-0.60	0.12-0.16	Moderate	.32	.37		
	26-28	---	---	0.00-0.60	---	---	---	---		
BnA:										
Blount----------	0-10	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	10-37	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	37-56	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	56-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
BoA:										
Blount----------	0-9	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	9-21	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	21-55	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	55-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
BoB:										
Blount----------	0-8	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	8-30	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	30-45	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	45-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
BpA:										
Blount----------	0-9	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	9-31	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	31-43	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	43-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Houcktown-------	0-9	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	9-28	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	28-52	27-37	1.70-1.90	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	52-80	23-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
BrA:										
Blount----------	0-9	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	9-26	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	26-52	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	52-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Jenera----------	0-9	10-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.20	.20	5	3
	9-31	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	31-44	15-35	1.50-1.70	0.20-0.60	0.09-0.12	Low	.37	.37		
	44-80	27-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
BuA:										
Blount----------	0-10	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	10-28	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	28-42	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	42-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
ChC:										
Channahon-------	0-7	20-27	1.30-1.55	0.60-2.00	0.15-0.23	Low	.32	.32	1	6
	7-13	20-35	1.15-1.35	0.60-2.00	0.15-0.22	Moderate	.32	.32		
	13-15	---	---	0.00-0.60	---	---	---	---		
Biglick---------	0-7	20-27	1.30-1.55	0.60-2.00	0.15-0.23	Low	.32	.32	1	6
	7-12	35-60	1.45-1.65	0.06-0.60	0.12-0.18	Moderate	.24	.32		
	12-14	---	---	0.00-0.60	---	---	---	---		
CoA:										
Colwood---------	0-11	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.28	.28	5	5
	11-56	18-35	1.30-1.60	0.20-2.00	0.17-0.22	Low	.43	.43		
	56-80	5-12	1.45-1.65	0.60-2.00	0.08-0.22	Low	.43	.43		
CtA:										
Cygnet----------	0-11	12-20	1.30-1.50	0.60-2.00	0.16-0.22	Low	.24	.28	4	5
	11-30	18-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.28	.32		
	30-53	5-25	1.40-1.60	2.00-6.00	0.12-0.16	Low	.24	.28		
	53-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
CuA:										
Cygnet----------	0-10	12-20	1.30-1.50	0.60-2.00	0.16-0.22	Low	.24	.28	4	5
	10-42	18-35	1.25-1.60	0.60-2.00	0.14-0.18	Low	.28	.32		
	42-57	5-25	1.40-1.60	2.00-6.00	0.12-0.16	Low	.24	.28		
	57-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
DbA:										
Darroch---------	0-11	12-26	1.30-1.60	0.60-2.00	0.18-0.24	Low	.32	.37	5	5
	11-44	18-35	1.50-1.70	0.60-2.00	0.09-0.20	Low	.37	.37		
	44-80	5-20	1.50-1.70	0.60-2.00	0.19-0.21	Low	.49	.55		
DeA:										
Del Rey---------	0-10	15-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.43	.43	5	6
	10-37	35-45	1.40-1.65	0.06-0.20	0.12-0.20	Moderate	.37	.37		
	37-80	22-33	1.50-1.70	0.06-0.20	0.09-0.11	Moderate	.43	.43		
DfA:										
Del Rey---------	0-9	15-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.43	.43	5	6
	9-41	35-45	1.40-1.65	0.06-0.20	0.12-0.20	Moderate	.37	.37		
	41-80	22-33	1.50-1.70	0.06-0.20	0.09-0.11	Moderate	.43	.43		
Blount----------	0-8	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	8-27	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	27-44	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	44-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
DuB:										
Dunbridge-------	0-8	4-8	1.40-1.60	6.00-20.00	0.10-0.13	Low	.17	.20	2	2
	8-25	18-30	1.45-1.70	2.00-6.00	0.10-0.18	Low	.20	.43		
	25-27	---	---	0.00-0.60	---	---	---	---		
EmA:										
Elliott---------	0-12	24-27	1.10-1.30	0.60-2.00	0.22-0.24	Low	.28	.28	4	6
	12-36	35-50	1.30-1.60	0.20-0.60	0.11-0.20	Moderate	.28	.28		
	36-80	27-40	1.70-1.90	0.06-0.60	0.07-0.10	Moderate	.32	.37		
FbA:										
Flatrock--------	0-9	18-27	1.20-1.50	0.60-2.00	0.20-0.24	Low	.32	.32	5	6
	9-44	18-35	1.25-1.60	0.60-2.00	0.17-0.22	Low	.32	.32		
	44-80	15-35	1.20-1.60	0.60-6.00	0.12-0.18	Low	.28	.32		
FcA:										
Flatrock--------	0-11	18-27	1.20-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	11-52	18-35	1.25-1.60	0.60-2.00	0.17-0.22	Low	.32	.32		
	52-80	15-35	1.20-1.60	0.60-6.00	0.12-0.18	Low	.28	.32		
FdA:										
Flatrock, limestone substratum-----	0-11	18-27	1.20-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	11-52	18-35	1.25-1.60	0.60-2.00	0.17-0.22	Low	.32	.32		
	52-64	15-35	1.20-1.60	0.60-6.00	0.12-0.18	Low	.28	.32		
	64-66	---	---	0.00-0.60	---	---	---	---		
FoA:										
Fox----------	0-9	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	9-30	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Low	.32	.32		
	30-80	0-5	1.30-1.70	6.00-99.90	0.02-0.04	Low	.10	.24		
FoB:										
Fox----------	0-9	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	9-37	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Low	.32	.32		
	37-80	0-5	1.30-1.70	6.00-99.90	0.02-0.04	Low	.10	.24		
FoC2:										
Fox----------	0-6	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	6-32	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Low	.32	.32		
	32-80	0-5	1.30-1.70	6.00-99.90	0.02-0.04	Low	.10	.24		
FsA:										
Fulton----------	0-8	16-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	8-42	45-60	1.40-1.65	0.06-0.20	0.09-0.13	Moderate	.28	.28		
	42-60	35-60	1.40-1.65	0.06-0.20	0.09-0.13	Moderate	.32	.32		
	60-80	35-60	1.45-1.65	0.01-0.20	0.08-0.12	Moderate	.32	.32		
FtA:										
Fulton, till substratum-----	0-10	16-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	10-25	45-60	1.40-1.65	0.06-0.20	0.09-0.13	Moderate	.28	.28		
	25-45	35-60	1.40-1.65	0.06-0.20	0.09-0.13	Moderate	.28	.28		
	45-68	35-60	1.45-1.65	0.01-0.20	0.08-0.12	Moderate	.32	.32		
	68-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
GaB:										
Gallman---------	0-10	10-25	1.30-1.45	0.60-2.00	0.14-0.20	Low	.32	.37	5	5
	10-61	18-30	1.45-1.65	2.00-6.00	0.10-0.16	Low	.24	.32		
	61-80	3-15	1.25-1.55	2.00-20.00	0.06-0.10	Low	.17	.24		
GfA:										
Gilford---------	0-12	10-20	1.50-1.70	2.00-6.00	0.17-0.24	Low	.10	.10	5	3
	12-27	8-17	1.60-1.70	2.00-6.00	0.10-0.14	Low	.20	.20		
	27-36	3-12	1.60-1.80	6.00-20.00	0.04-0.11	Low	.15	.15		
	36-80	2-10	1.65-1.80	6.00-20.00	0.03-0.11	Low	.15	.15		
GmA:										
Glynwood, limestone substratum-----	0-10	16-27	1.25-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	10-31	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	31-40	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	40-61	22-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
	61-63	---	---	0.00-0.60	---	---	---	---		
GnB:										
Glynwood--------	0-9	16-27	1.25-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	9-37	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	37-47	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	47-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
GpB2:										
Glynwood--------	0-7	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	7
	7-31	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	31-40	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	40-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
GpC2:										
Glynwood--------	0-6	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	7
	6-32	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	32-41	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	41-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
GsB:										
Glynwood--------	0-7	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	6
	7-36	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	36-47	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	47-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Blount----------	0-8	22-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	8-32	35-48	1.40-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	32-44	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	44-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Houcktown-------	0-9	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	9-37	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	37-45	27-37	1.70-1.90	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	45-80	23-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
GuB:										
Glynwood--------	0-10	16-27	1.25-1.50	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	10-36	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	36-49	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	49-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
HaA:										
Harrod----------	0-13	18-27	1.20-1.45	0.60-2.00	0.20-0.24	Low	.28	.28	2	6
	13-33	18-32	1.20-1.50	0.60-2.00	0.14-0.18	Low	.24	.28		
	33-35	---	---	0.00-0.60	---	---	---	---		
HkA:										
Haskins---------	0-11	10-18	1.30-1.45	2.00-6.00	0.12-0.18	Low	.24	.28	4	3
	11-37	18-35	1.45-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	37-54	27-42	1.70-1.90	0.01-0.20	0.05-0.10	Moderate	.28	.32		
	54-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
HnA:										
Haskins---------	0-9	12-20	1.30-1.45	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	9-36	18-35	1.45-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	36-52	27-42	1.70-1.90	0.01-0.20	0.05-0.10	Moderate	.28	.32		
	52-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
HpA:										
Houcktown-------	0-8	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	8-35	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	35-51	27-37	1.70-1.90	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	51-80	23-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
HpB:										
Houcktown-------	0-10	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	10-30	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	30-50	27-37	1.70-1.90	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	50-80	23-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
HrB:										
Houcktown-------	0-9	12-20	1.35-1.50	0.60-2.00	0.18-0.22	Low	.37	.37	4	5
	9-21	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.37		
	21-45	27-37	1.70-1.90	0.06-0.60	0.06-0.10	Moderate	.32	.37		
	45-80	27-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Glynwood--------	0-7	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	6
	7-36	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	36-47	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	47-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Jenera----------	0-8	10-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.20	.20	5	3
	8-47	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	47-58	15-35	1.50-1.70	0.20-0.60	0.09-0.12	Low	.37	.37		
	58-80	27-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
HsA:										
Hoytville-------	0-9	27-40	1.25-1.50	0.20-2.00	0.19-0.23	Moderate	.28	.28	5	7
	9-41	40-55	1.35-1.60	0.20-0.60	0.08-0.13	Moderate	.28	.32		
	41-60	35-50	1.40-1.75	0.06-0.20	0.05-0.10	Moderate	.32	.37		
	60-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
HtA:										
Hoytville-------	0-8	40-48	1.30-1.55	0.20-0.60	0.10-0.14	Moderate	.24	.24	5	4
	8-41	40-55	1.35-1.60	0.20-0.60	0.08-0.13	Moderate	.28	.32		
	41-64	35-50	1.40-1.75	0.06-0.20	0.05-0.10	Moderate	.32	.37		
	64-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
JeA:										
Jenera----------	0-10	10-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.20	.20	5	3
	10-37	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	37-50	15-35	1.50-1.70	0.20-0.60	0.09-0.12	Low	.37	.37		
	50-80	25-35	1.65-1.75	0.06-0.60	0.06-0.10	Moderate	.32	.37		
JeB:										
Jenera----------	0-8	10-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.20	.20	5	3
	8-47	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	47-58	15-35	1.50-1.70	0.20-0.60	0.09-0.12	Low	.37	.37		
	58-80	25-35	1.65-1.75	0.06-0.60	0.06-0.10	Moderate	.32	.37		
JfB:										
Jenera----------	0-9	10-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.20	.20	5	3
	9-21	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	21-59	15-35	1.50-1.70	0.20-0.60	0.09-0.12	Low	.37	.37		
	59-80	27-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Shinrock, till substratum-----	0-8	18-27	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.37	5	6
	8-24	35-45	1.35-1.70	0.20-0.60	0.10-0.16	Moderate	.37	.37		
	24-40	8-40	1.40-1.65	0.20-2.00	0.10-0.14	Low	.37	.37		
	40-67	8-40	1.30-1.60	0.20-2.00	0.10-0.14	Low	.37	.37		
	67-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
JoA:										
Joliet----------	0-9	20-27	1.10-1.30	0.60-2.00	0.17-0.24	Low	.28	.32	1	6
	9-18	10-35	1.40-1.60	0.60-2.00	0.17-0.24	Low	.32	.32		
	18-20	---	---	0.00-0.60	---	---	---	---		
KnA:										
Knoxdale--------	0-11	18-27	1.20-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	11-47	18-35	1.25-1.60	0.60-2.00	0.17-0.22	Low	.37	.37		
	47-80	15-27	1.20-1.60	0.60-6.00	0.12-0.18	Low	.28	.32		
LbA:										
Lamberjack------	0-11	10-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.32	4	5
	11-39	18-35	1.35-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	39-44	15-32	1.40-1.60	0.60-2.00	0.10-0.14	Low	.28	.32		
	44-62	2-15	1.50-1.70	6.00-20.00	0.08-0.12	Low	.15	.20		
	62-80	20-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
LcA:										
Lamberjack------	0-11	10-27	1.30-1.45	0.60-2.00	0.18-0.22	Low	.28	.32	4	5
	11-36	18-35	1.35-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	36-45	15-32	1.40-1.60	0.60-2.00	0.10-0.14	Low	.28	.32		
	45-60	2-15	1.50-1.70	6.00-20.00	0.08-0.12	Low	.15	.20		
	60-80	20-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
LuB2:										
Lucas----------	0-7	27-40	1.35-1.55	0.20-0.60	0.16-0.19	Moderate	.37	.37	5	7
	7-23	45-60	1.35-1.65	0.01-0.20	0.12-0.14	Moderate	.28	.28		
	23-42	45-60	1.35-1.65	0.01-0.20	0.12-0.14	Moderate	.28	.28		
	42-80	35-60	1.45-1.70	0.01-0.20	0.08-0.12	Moderate	.32	.32		
LyE:										
Lybrand---------	0-8	18-27	1.35-1.55	0.60-2.00	0.20-0.24	Low	.43	.43	4	6
	8-29	35-50	1.55-1.75	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	29-47	27-40	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	47-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
MbA:										
Medway----------	0-12	18-27	1.20-1.45	0.60-2.00	0.20-0.24	Low	.28	.28	5	6
	12-50	18-32	1.20-1.50	0.60-2.00	0.14-0.18	Low	.32	.37		
	50-66	5-27	1.20-1.60	0.60-6.00	0.11-0.15	Low	.28	.32		
	66-80	5-27	1.20-1.60	0.60-6.00	0.08-0.15	Low	.28	.32		
McA:										
Medway, limestone substratum-----	0-10	18-27	1.20-1.45	0.60-2.00	0.20-0.24	Low	.28	.28	5	6
	10-55	18-32	1.20-1.50	0.60-2.00	0.14-0.18	Low	.32	.37		
	55-72	5-27	1.20-1.60	0.60-6.00	0.11-0.15	Low	.28	.32		
	72-74	---	---	0.00-0.60	---	---	---	---		
MeA:										
Mermill---------	0-9	14-27	1.25-1.50	0.60-2.00	0.18-0.24	Low	.28	.28	4	6
	9-28	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	28-57	27-42	1.60-1.80	0.01-0.20	0.06-0.10	Moderate	.28	.32		
	57-80	27-42	1.60-1.80	0.01-0.20	0.05-0.10	Moderate	.28	.32		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
MfA:										
Mermill---------	0-8	27-32	1.35-1.55	0.60-2.00	0.16-0.20	Moderate	.37	.37	4	7
	8-30	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	30-47	27-42	1.60-1.80	0.01-0.20	0.06-0.10	Moderate	.28	.32		
	47-80	27-42	1.60-1.80	0.01-0.20	0.05-0.10	Moderate	.28	.32		
MgA:										
Millsdale-------	0-13	27-35	1.30-1.50	0.60-2.00	0.17-0.22	Moderate	.28	.32	2	7
	13-35	35-45	1.40-1.65	0.20-0.60	0.12-0.16	Moderate	.28	.32		
	35-37	---	---	0.00-0.60	---	---	---	---		
MnA:										
Milton----------	0-10	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	10-21	35-50	1.45-1.65	0.20-0.60	0.12-0.18	Moderate	.32	.37		
	21-29	40-60	1.40-1.70	0.20-0.60	0.12-0.16	Moderate	.32	.37		
	29-31	---	---	0.00-0.60	---	---	---	---		
MpD3:										
Morley----------	0-6	27-40	1.40-1.60	0.20-0.60	0.17-0.20	Moderate	.37	.37	4	6
	6-14	35-50	1.45-1.70	0.06-0.60	0.11-0.15	Moderate	.28	.32		
	14-39	27-40	1.70-1.90	0.06-0.60	0.07-0.15	Moderate	.28	.32		
	39-80	27-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
MrA:										
Morley, limestone substratum-----	0-8	16-27	1.35-1.55	0.60-2.00	0.20-0.24	Low	.37	.37	4	6
	8-24	35-42	1.55-1.70	0.06-0.60	0.11-0.15	Moderate	.28	.32		
	24-45	27-40	1.70-1.90	0.06-0.60	0.07-0.15	Moderate	.28	.32		
	45-66	22-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
	66-68	---	---	0.00-0.60	---	---	---	---		
MsB:										
Morley, limestone substratum-----	0-9	16-27	1.35-1.55	0.60-2.00	0.20-0.24	Low	.37	.37	4	6
	9-34	35-42	1.55-1.70	0.06-0.60	0.11-0.15	Moderate	.28	.32		
	34-42	27-40	1.70-1.90	0.06-0.60	0.07-0.15	Moderate	.28	.32		
	42-61	22-35	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
	61-63	---	---	0.00-0.60	---	---	---	---		
Milton----------	0-8	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	8-27	35-50	1.45-1.65	0.20-0.60	0.12-0.18	Moderate	.32	.37		
	27-29	40-60	1.40-1.70	0.20-0.60	0.12-0.16	Moderate	.32	.37		
	29-31	---	---	0.00-0.60	---	---	---	---		
MvB:										
Mortimer--------	0-8	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	6
	8-39	40-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.28	.28		
	39-49	40-60	1.60-1.80	0.06-0.20	0.05-0.14	Moderate	.32	.37		
	49-80	40-60	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
MwB2:										
Mortimer--------	0-7	27-38	1.30-1.50	0.20-0.60	0.18-0.22	Moderate	.37	.37	4	7
	7-39	40-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.28	.28		
	39-52	40-60	1.60-1.80	0.06-0.20	0.05-0.14	Moderate	.32	.37		
	52-80	40-60	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
NnA:										
Nappanee--------	0-8	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	3	6
	8-34	45-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.37	.37		
	34-56	27-42	1.60-1.90	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	56-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
NnB:										
Nappanee--------	0-8	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	3	6
	8-31	45-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.37	.37		
	31-46	27-42	1.60-1.90	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	46-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
NpA:										
Nappanee--------	0-8	27-38	1.30-1.50	0.20-0.60	0.18-0.22	Moderate	.43	.43	4	7
	8-40	45-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.37	.37		
	40-56	27-42	1.60-1.90	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	56-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
NpB2:										
Nappanee--------	0-7	27-38	1.30-1.50	0.20-0.60	0.18-0.22	Moderate	.43	.43	4	7
	7-32	45-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.37	.37		
	32-40	27-42	1.60-1.90	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	40-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
NrA:										
Nappanee--------	0-8	20-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	3	6
	8-34	45-60	1.40-1.65	0.06-0.20	0.08-0.14	Moderate	.37	.37		
	34-49	27-42	1.60-1.90	0.06-0.20	0.06-0.12	Moderate	.32	.37		
	49-80	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
OrA:										
Oshtemo---------	0-9	2-10	1.20-1.60	2.00-6.00	0.10-0.15	Low	.24	.24	5	3
	9-29	10-20	1.20-1.60	2.00-6.00	0.12-0.19	Low	.24	.32		
	29-52	5-15	1.20-1.60	2.00-6.00	0.08-0.10	Low	.17	.24		
	52-80	0-10	1.30-1.50	20.00-99.90	0.02-0.04	Low	.10	.24		
OrB:										
Oshtemo---------	0-10	2-10	1.20-1.60	2.00-6.00	0.10-0.15	Low	.24	.24	5	3
	10-27	10-20	1.20-1.60	2.00-6.00	0.12-0.19	Low	.24	.32		
	27-43	5-15	1.20-1.60	2.00-6.00	0.08-0.10	Low	.17	.24		
	43-80	0-10	1.30-1.50	20.00-99.90	0.02-0.04	Low	.10	.24		
OrC:										
Oshtemo---------	0-8	2-10	1.20-1.60	2.00-6.00	0.10-0.15	Low	.24	.24	5	3
	8-25	10-20	1.20-1.60	2.00-6.00	0.12-0.19	Low	.24	.32		
	25-52	5-15	1.20-1.60	2.00-6.00	0.08-0.10	Low	.17	.24		
	52-80	0-10	1.30-1.50	20.00-99.90	0.02-0.04	Low	.10	.24		
OsB:										
Oshtemo, till substratum-----	0-11	5-15	1.15-1.60	2.00-6.00	0.12-0.15	Low	.24	.24	5	3
	11-34	10-20	1.20-1.60	2.00-6.00	0.12-0.19	Low	.24	.32		
	34-44	5-15	1.20-1.60	2.00-6.00	0.08-0.10	Low	.17	.24		
	44-75	5-10	1.30-1.50	20.00-99.90	0.02-0.04	Low	.10	.24		
	75-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
OwB:										
Ottokee---------	0-11	2-10	1.40-1.60	6.00-20.00	0.09-0.12	Low	.17	.17	5	2
	11-65	1-12	1.50-1.70	6.00-20.00	0.06-0.10	Low	.17	.17		
	65-80	1-8	1.50-1.70	6.00-20.00	0.03-0.06	Low	.15	.15		
PbA:										
Patton----------	0-12	27-35	1.15-1.35	0.60-2.00	0.21-0.23	Moderate	.28	.28	5	7
	12-48	27-35	1.25-1.45	0.60-2.00	0.18-0.20	Moderate	.43	.43		
	48-80	22-35	1.30-1.50	0.20-0.60	0.18-0.22	Moderate	.43	.43		
PmA:										
Pewamo----------	0-11	27-40	1.35-1.55	0.60-2.00	0.20-0.23	Moderate	.28	.28	5	7
	11-53	35-50	1.40-1.70	0.20-0.60	0.12-0.20	Moderate	.32	.32		
	53-80	27-40	1.50-1.70	0.20-0.60	0.14-0.18	Moderate	.37	.37		
PnA:										
Pewamo----------	0-10	27-40	1.35-1.55	0.60-2.00	0.20-0.23	Moderate	.28	.28	5	7
	10-52	35-50	1.40-1.70	0.20-0.60	0.12-0.20	Moderate	.32	.32		
	52-80	27-40	1.50-1.70	0.20-0.60	0.14-0.18	Moderate	.37	.37		
Urban land------	---	---	---	---	---	---	---	---	-	---
Pt:										
Pits----------	---	---	---	---	---	---	---	---	-	---
RcA:										
Randolph--------	0-11	16-27	1.30-1.45	0.60-2.00	0.17-0.22	Low	.37	.37	2	6
	11-25	35-50	1.40-1.65	0.20-0.60	0.13-0.16	Moderate	.28	.32		
	25-27	---	---	0.00-0.60	---	---	---	---		
RgB:										
Rawson----------	0-19	9-18	1.30-1.45	0.60-2.00	0.12-0.18	Low	.24	.28	4	3
	19-32	18-35	1.50-1.70	0.60-2.00	0.12-0.16	Low	.32	.49		
	32-36	27-50	1.60-1.80	0.01-0.20	0.05-0.10	Moderate	.32	.37		
	36-60	27-42	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
RhA:										
Rensselaer, till substratum-----	0-12	15-27	1.30-1.45	0.60-2.00	0.22-0.24	Low	.28	.28	5	6
	12-46	18-35	1.30-1.60	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	46-54	18-27	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	54-63	2-20	1.50-1.70	0.60-2.00	0.10-0.19	Low	.37	.37		
	63-80	27-40	1.60-1.80	0.06-0.60	0.07-0.10	Moderate	.32	.37		
RnA:										
Rimer----------	0-10	3-15	1.40-1.60	6.00-20.00	0.07-0.12	Low	.17	.17	4	2
	10-23	5-15	1.40-1.70	6.00-20.00	0.06-0.11	Low	.17	.17		
	23-28	7-18	1.50-1.70	2.00-6.00	0.12-0.17	Low	.20	.20		
	28-54	30-45	1.50-1.80	0.06-0.20	0.06-0.10	Moderate	.32	.37		
	54-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
RoA:										
Rimer, deep phase----------	0-11	3-15	1.40-1.60	6.00-20.00	0.07-0.12	Low	.17	.17	4	2
	11-24	5-15	1.40-1.70	6.00-20.00	0.06-0.11	Low	.17	.17		
	24-45	7-18	1.50-1.70	2.00-6.00	0.12-0.17	Low	.20	.20		
	45-52	5-15	1.40-1.70	6.00-20.00	0.06-0.11	Low	.17	.17		
	52-80	25-35	1.50-1.75	0.06-0.60	0.05-0.10	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
RtA:										
Rossburg--------	0-13	13-27	1.20-1.50	0.60-2.00	0.19-0.24	Low	.28	.28	5	6
	13-56	18-27	1.25-1.60	0.60-2.00	0.15-0.22	Low	.37	.37		
	56-80	5-15	1.30-1.60	2.00-6.00	0.05-0.15	Low	.24	.32		
SeA:										
Shawtown--------	0-9	12-27	1.30-1.45	0.60-2.00	0.14-0.18	Low	.28	.32	4	5
	9-53	18-35	1.40-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	53-66	3-15	1.30-1.70	6.00-20.00	0.02-0.07	Low	.17	.20		
	66-80	23-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
SeB:										
Shawtown--------	0-9	12-27	1.30-1.45	0.60-2.00	0.14-0.18	Low	.28	.32	4	5
	9-55	18-35	1.40-1.60	0.60-2.00	0.12-0.16	Low	.24	.28		
	55-63	3-15	1.30-1.70	6.00-20.00	0.02-0.07	Low	.17	.20		
	63-80	23-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
SfB:										
Shinrock--------	0-8	18-27	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.37	5	6
	8-36	35-45	1.35-1.70	0.20-0.60	0.10-0.16	Moderate	.37	.37		
	36-50	8-40	1.40-1.65	0.20-2.00	0.10-0.14	Low	.37	.37		
	50-80	8-40	1.30-1.60	0.20-2.00	0.10-0.14	Low	.37	.37		
SgC2:										
Shinrock--------	0-7	27-40	1.35-1.55	0.20-0.60	0.21-0.23	Moderate	.37	.37	5	7
	7-34	35-45	1.35-1.70	0.20-0.60	0.10-0.16	Moderate	.37	.37		
	34-51	8-40	1.40-1.65	0.20-2.00	0.10-0.14	Low	.37	.37		
	51-80	8-40	1.30-1.60	0.20-2.00	0.10-0.14	Low	.37	.37		
SkB:										
Shinrock, till substratum-----	0-10	18-27	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.37	5	6
	10-26	35-45	1.35-1.70	0.20-0.60	0.10-0.16	Moderate	.37	.37		
	26-43	8-40	1.40-1.65	0.20-2.00	0.10-0.14	Low	.37	.37		
	43-62	8-40	1.30-1.60	0.20-2.00	0.10-0.14	Low	.37	.37		
	62-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Glynwood--------	0-8	27-38	1.35-1.55	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	7
	8-26	35-55	1.45-1.70	0.06-0.20	0.12-0.19	Moderate	.32	.37		
	26-39	27-42	1.70-1.90	0.06-0.20	0.07-0.15	Moderate	.32	.37		
	39-80	27-40	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
SmA:										
Shoals----------	0-11	18-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.24	.24	5	6
	11-59	18-33	1.40-1.70	0.60-2.00	0.15-0.22	Moderate	.32	.32		
	59-80	5-25	1.35-1.65	0.60-2.00	0.05-0.20	Low	.37	.37		
SnA:										
Sloan----------	0-11	15-27	1.20-1.40	0.60-2.00	0.19-0.24	Low	.28	.28	5	6
	11-46	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.32	.37		
	46-80	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low	.32	.43		
SoA:										
Sloan----------	0-11	27-35	1.30-1.50	0.60-2.00	0.18-0.22	Moderate	.28	.28	5	7
	11-58	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.32	.37		
	58-80	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low	.32	.43		
SpA:										
Sloan, limestone substratum-----	0-10	27-35	1.30-1.50	0.60-2.00	0.18-0.22	Moderate	.28	.28	5	7
	10-39	22-35	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.32	.37		
	39-71	10-30	1.20-1.50	0.20-2.00	0.13-0.18	Low	.32	.43		
	71-73	---	---	0.00-0.60	---	---	---	---		
StB2:										
St. Clair-------	0-4	27-40	1.50-1.60	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	7
	4-37	40-60	1.35-1.70	0.06-0.20	0.08-0.17	Moderate	.32	.37		
	37-48	35-55	1.65-1.85	0.06-0.20	0.05-0.12	Moderate	.32	.37		
	48-80	35-55	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
StC2:										
St. Clair-------	0-6	27-40	1.50-1.60	0.20-0.60	0.17-0.23	Moderate	.43	.43	4	7
	6-35	40-60	1.35-1.70	0.06-0.20	0.08-0.17	Moderate	.32	.37		
	35-42	35-55	1.65-1.85	0.06-0.20	0.05-0.12	Moderate	.32	.37		
	42-80	35-55	1.70-1.90	0.01-0.20	0.01-0.05	Moderate	.32	.37		
Thackery, till substratum-----	0-10	15-27	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	6
	10-25	20-32	1.30-1.55	0.60-2.00	0.17-0.22	Low	.37	.37		
	25-56	20-35	1.30-1.60	0.60-2.00	0.13-0.18	Moderate	.32	.37		
	56-69	2-10	1.50-1.70	6.00-99.90	0.02-0.06	Low	.15	.20		
	69-80	20-35	1.80-2.00	0.01-0.60	0.01-0.05	Moderate	.32	.37		
TkA:										
Tiderishi-------	0-11	15-25	1.30-1.45	0.60-2.00	0.18-0.22	Low	.24	.24	5	6
	11-42	18-35	1.30-1.70	0.60-2.00	0.12-0.16	Low	.28	.32		
	42-57	15-32	1.45-1.70	0.60-2.00	0.10-0.16	Low	.28	.32		
	57-80	25-35	1.65-1.75	0.06-0.60	0.05-0.10	Moderate	.32	.37		

TABLE 29.--PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in	Pct				
TnA:										
Toledo----------	0-9	27-40	1.40-1.60	0.20-0.60	0.17-0.23	Moderate	.28	.28	5	7
	9-50	40-60	1.40-1.70	0.06-0.20	0.09-0.13	Moderate	.28	.28		
	50-80	35-60	1.45-1.75	0.06-0.20	0.08-0.12	Moderate	.32	.32		
ToB:										
Tuscola---------	0-10	5-15	1.30-1.65	2.00-6.00	0.11-0.13	Low	.17	.17	5	2
	10-55	18-35	1.30-1.70	0.60-2.00	0.15-0.20	Low	.32	.32		
	55-80	5-35	1.30-1.70	0.60-2.00	0.14-0.18	Low	.32	.32		
TpA:										
Tuscola---------	0-8	8-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.24	.24	5	3
	8-40	18-35	1.30-1.70	0.60-2.00	0.15-0.20	Low	.32	.32		
	40-80	5-35	1.30-1.70	0.60-2.00	0.14-0.18	Low	.32	.32		
TpB:										
Tuscola---------	0-11	8-20	1.30-1.65	2.00-6.00	0.13-0.22	Low	.24	.24	5	3
	11-44	18-35	1.30-1.70	0.60-2.00	0.15-0.20	Low	.32	.32		
	44-80	5-35	1.30-1.70	0.60-2.00	0.14-0.18	Low	.32	.32		
TuB:										
Tuscola---------	0-9	8-20	1.30-1.65	0.60-2.00	0.20-0.22	Low	.32	.32	5	5
	9-43	18-35	1.30-1.70	0.60-2.00	0.15-0.20	Low	.32	.32		
	43-80	5-35	1.30-1.70	0.60-2.00	0.14-0.18	Low	.32	.32		
UcA:										
Udorthents------	---	---	---	---	---	---	---	---	-	---
UcD:										
Udorthents------	---	---	---	---	---	---	---	---	-	---
Ur:										
Urban land------	---	---	---	---	---	---	---	---	-	---
VaA:										
Vanlue----------	0-10	10-25	1.30-1.45	0.60-2.00	0.18-0.22	Low	.32	.32	5	5
	10-35	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Low	.32	.32		
	35-59	10-35	1.50-1.70	0.20-0.60	0.08-0.14	Low	.37	.37		
	59-80	22-35	1.65-1.75	0.06-0.60	0.05-0.10	Moderate	.32	.37		
VeA:										
Vaughnsville----	0-8	18-27	1.30-1.50	0.60-2.00	0.19-0.23	Low	.32	.32	5	6
	8-20	18-35	1.40-1.60	0.60-2.00	0.14-0.18	Low	.32	.32		
	20-36	5-27	1.45-1.75	0.60-6.00	0.12-0.18	Low	.24	.28		
	36-45	27-42	1.50-1.80	0.06-0.60	0.10-0.16	Moderate	.32	.37		
	45-80	27-42	1.80-2.00	0.01-0.20	0.01-0.05	Moderate	.32	.37		
W:										
Water----------	---	---	---	---	---	---	---	---	-	---
WeA:										
Westland--------	0-10	15-27	1.30-1.60	0.60-2.00	0.19-0.24	Low	.24	.24	4	6
	10-52	24-35	1.40-1.65	0.60-2.00	0.13-0.19	Moderate	.28	.32		
	52-59	5-30	1.55-1.70	0.60-2.00	0.07-0.17	Low	.24	.37		
	59-80	1-10	1.50-1.70	20.00-99.90	0.01-0.04	Low	.05	.10		
Rensselaer------	0-19	15-27	1.30-1.45	0.60-2.00	0.22-0.24	Low	.28	.28	5	6
	19-38	20-35	1.30-1.60	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	38-58	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	58-80	2-20	1.50-1.70	0.60-2.00	0.10-0.19	Low	.37	.37		

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
AdA:					
Adrian----------	0-26	5.1-7.3	55-75	125-200	0
	26-80	6.1-8.4	0.0-2.0	1.0-10	0-40
AkA:					
Alvada----------	0-10	5.6-7.3	3.0-8.0	13-32	0
	10-39	6.1-7.8	0.5-2.0	8.0-29	0-5
	39-46	6.1-7.8	0.5-1.0	8.0-21	0-15
	46-50	7.4-8.4	0.0-0.5	2.0-12	5-30
	50-80	7.4-8.4	0.0-0.5	9.0-22	15-30
AmA:					
Alvada----------	0-11	5.6-7.3	3.0-8.0	13-32	0
	11-42	6.1-7.8	0.5-2.0	8.0-29	0-5
	42-46	6.1-7.8	0.5-1.0	8.0-21	0-15
	46-53	7.4-8.4	0.0-0.5	2.0-12	5-30
	53-80	7.4-8.4	0.0-0.5	9.0-22	15-30
Urban land------	---	---	---	---	---
AnA:					
Aquents---------	0-6	5.6-7.3	1.0-3.0	17-34	0
	6-30	6.6-7.8	0.0-1.0	15-34	0-5
	30-80	7.4-8.4	0.0-1.0	11-25	15-30
ApB:					
Arkport---------	0-10	4.5-7.3	0.5-2.0	3.0-13	0-1
	10-15	4.5-7.3	0.0-1.0	1.0-11	0-1
	15-69	5.1-7.3	0.0-1.0	1.0-11	0-1
	69-80	5.6-8.4	0.0-0.5	1.0-4.0	0-5
ArA:					
Aurand----------	0-11	5.6-7.3	2.0-6.0	8.0-28	0
	11-29	5.6-7.8	0.5-2.0	8.0-29	0-5
	29-33	6.6-7.8	0.0-1.0	8.0-23	0-5
	33-48	7.4-8.4	0.0-0.5	11-23	0-20
	48-80	7.4-8.4	0.0-0.5	11-23	15-30
AsA:					
Aurand----------	0-10	5.6-7.3	2.0-6.0	8.0-28	0
	10-26	5.6-7.8	0.5-2.0	8.0-29	0-5
	26-35	6.6-7.8	0.0-1.0	8.0-23	0-5
	35-50	7.4-8.4	0.0-0.5	11-23	0-20
	50-80	7.4-8.4	0.0-0.5	11-23	15-30
Urban land------	---	---	---	---	---
BgA:					
Biglick---------	0-10	6.1-7.8	1.0-3.0	10-22	0
	10-14	6.6-8.4	0.5-1.0	15-38	0-20
	14-16	---	---	---	---
Milton----------	0-10	5.1-7.3	1.0-3.0	8.0-22	0
	10-14	4.5-7.8	0.5-1.0	16-32	0
	14-24	6.1-7.8	0.0-0.5	10-27	0-15
	24-26	---	---	---	---
BgB:					
Biglick---------	0-9	6.1-7.8	1.0-3.0	10-22	0
	9-13	6.6-8.4	0.5-1.0	15-38	0-20
	13-15	---	---	---	---
Milton----------	0-8	5.1-7.3	1.0-3.0	8.0-22	0
	8-20	4.5-7.8	0.5-1.0	16-32	0
	20-26	6.1-7.8	0.0-0.5	10-27	0-15
	26-28	---	---	---	---
BnA:					
Blount----------	0-10	5.1-7.3	2.0-4.0	13-22	0
	10-37	4.5-6.5	0.0-1.0	14-30	0
	37-56	6.1-8.4	0.0-0.5	11-26	0-25
	56-80	7.4-8.4	0.0-0.5	11-25	22-35
BoA:					
Blount----------	0-9	5.1-7.3	2.0-4.0	13-22	0
	9-21	4.5-7.3	0.0-1.0	14-30	0
	21-55	6.1-8.4	0.0-0.5	11-26	0-25
	55-80	7.4-8.4	0.0-0.5	11-25	22-35

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
BoB:					
Blount----------	0-8	5.1-7.3	2.0-4.0	13-22	0
	8-30	4.5-6.5	0.0-1.0	14-30	0
	30-45	6.1-8.4	0.0-0.5	11-26	0-25
	45-80	7.4-8.4	0.0-0.5	11-25	22-35
BpA:					
Blount----------	0-9	5.1-7.3	2.0-4.0	13-22	0
	9-31	4.5-6.5	0.0-1.0	14-30	0
	31-43	6.1-8.4	0.0-0.5	11-26	0-25
	43-80	7.4-8.4	0.0-0.5	11-25	22-35
Houcktown-------	0-9	5.6-7.3	1.0-3.0	6.0-18	0
	9-28	5.6-7.8	0.5-2.0	7.0-25	0-5
	28-52	6.6-8.4	0.0-0.5	12-23	0-30
	52-80	7.4-8.4	0.0-0.5	9.0-22	20-30
BrA:					
Blount----------	0-9	5.1-7.3	2.0-4.0	13-22	0
	9-26	4.5-6.5	0.0-1.0	14-30	0
	26-52	6.1-8.4	0.0-0.5	11-26	0-25
	52-80	7.4-8.4	0.0-0.5	11-25	22-35
Jenera----------	0-9	5.6-7.3	1.0-3.0	6.0-18	0
	9-31	5.6-7.3	0.5-1.0	8.0-23	0
	31-44	6.1-7.8	0.5-1.0	7.0-23	0-5
	44-80	7.4-8.4	0.0-0.5	10-22	15-35
BuA:					
Blount----------	0-10	5.1-7.3	2.0-4.0	13-22	0
	10-28	4.5-6.5	0.0-1.0	14-30	0
	28-42	6.1-8.4	0.0-0.5	11-26	0-25
	42-80	7.4-8.4	0.0-0.5	11-25	22-35
Urban land------	---	---	---	---	---
ChC:					
Channahon-------	0-7	6.1-8.4	2.0-4.0	12-24	0-15
	7-13	6.1-8.4	0.0-1.0	8.0-23	0-15
	13-15	---	---	---	---
Biglick---------	0-7	6.1-7.8	1.0-3.0	10-22	0
	7-12	6.6-8.4	0.5-1.0	15-38	0-20
	12-14	---	---	---	---
CoA:					
Colwood---------	0-11	6.1-7.8	3.0-8.0	9.0-32	0
	11-56	6.1-7.8	0.5-1.0	8.0-23	0-5
	56-80	7.4-8.4	0.0-0.5	2.0-8.0	5-20
CtA:					
Cygnet----------	0-11	5.1-7.3	1.0-3.0	7.0-18	0
	11-30	5.1-7.3	0.5-1.0	8.0-23	0
	30-53	6.6-7.8	0.5-1.0	3.0-17	0-5
	53-80	7.4-8.4	0.0-0.5	11-26	20-35
CuA:					
Cygnet----------	0-10	5.1-7.3	1.0-3.0	7.0-18	0
	10-42	5.1-7.3	0.5-1.0	8.0-23	0
	42-57	6.6-7.8	0.5-1.0	3.0-17	0-5
	57-80	7.4-8.4	0.0-0.5	11-26	20-35
Urban land------	---	---	---	---	---
DbA:					
Darroch---------	0-11	5.6-7.3	2.0-4.0	9.0-24	0
	11-44	5.6-7.3	0.5-1.0	8.0-23	0
	44-80	7.4-8.4	0.0-0.5	2.0-13	10-40
DeA:					
Del Rey---------	0-10	4.5-7.3	2.0-3.0	10-22	0
	10-37	4.5-7.8	0.0-1.0	14-29	0-10
	37-80	7.4-8.4	0.0-0.5	9.0-21	5-40
DfA:					
Del Rey---------	0-9	4.5-7.3	2.0-3.0	10-22	0
	9-41	4.5-7.8	0.0-1.0	14-29	0-10
	41-80	7.4-8.4	0.0-0.5	9.0-21	5-40
Blount----------	0-8	5.1-7.3	2.0-4.0	13-22	0
	8-27	4.5-6.5	0.0-1.0	14-30	0
	27-44	6.1-7.8	0.0-0.5	11-26	0-25
	44-80	7.4-8.4	0.0-0.5	11-25	22-35

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
DuB:					
Dunbridge-------	0-8	6.1-7.8	2.0-4.0	6.0-13	0
	8-25	6.1-7.8	0.5-1.0	8.0-20	0-15
	25-27	---	---	---	---
EmA:					
Elliott---------	0-12	5.6-7.3	3.0-6.0	18-28	0
	12-36	5.6-7.8	0.0-1.0	14-32	0-5
	36-80	7.4-8.4	0.0-0.5	11-25	10-40
FbA:					
Flatrock--------	0-9	5.6-7.3	1.0-3.0	9.0-22	0
	9-44	6.1-7.8	0.5-1.0	8.0-23	0-5
	44-80	6.6-8.4	0.5-1.0	7.0-23	0-20
FcA:					
Flatrock--------	0-11	5.6-7.3	1.0-3.0	9.0-22	0
	11-52	6.1-7.8	0.5-1.0	8.0-23	0-5
	52-80	6.6-8.4	0.5-1.0	7.0-23	0-20
FdA:					
Flatrock, limestone substratum-----	0-11	5.6-7.3	1.0-3.0	9.0-22	0
	11-52	6.1-7.8	0.5-1.0	8.0-23	0-5
	52-64	6.6-8.4	0.5-1.0	7.0-23	0-20
	64-66	---	---	---	---
FoA:					
Fox----------	0-9	5.1-7.3	1.0-3.0	6.0-16	0
	9-30	5.6-7.8	0.0-0.5	7.0-22	0-15
	30-80	7.4-8.4	0.0-0.5	0.0-4.0	5-45
FoB:					
Fox----------	0-9	5.1-7.3	1.0-3.0	6.0-16	0
	9-37	5.6-7.8	0.0-0.5	7.0-22	0-15
	37-80	7.4-8.4	0.0-0.5	0.0-4.0	5-45
FoC2:					
Fox----------	0-6	5.1-7.3	0.5-2.0	5.0-14	0
	6-32	5.6-7.8	0.0-0.5	7.0-22	0-15
	32-80	7.4-8.4	0.0-0.5	0.0-4.0	5-45
FsA:					
Fulton----------	0-8	5.1-7.3	2.0-3.0	10-22	0
	8-42	5.1-7.8	0.5-1.0	19-38	0-5
	42-60	7.4-8.4	0.0-0.5	14-37	5-20
	60-80	7.4-8.4	0.0-0.5	14-37	10-30
FtA:					
Fulton, till substratum-----	0-10	5.1-7.3	2.0-3.0	10-22	0
	10-25	5.1-7.8	0.5-1.0	19-38	0-5
	25-45	7.4-8.4	0.0-0.5	14-37	5-20
	45-68	7.4-8.4	0.0-0.5	14-37	10-30
	68-80	7.4-8.4	0.0-0.5	12-26	20-30
GaB:					
Gallman---------	0-10	5.6-7.3	1.0-3.0	6.0-21	0
	10-61	4.5-7.3	0.0-1.0	6.0-20	0
	61-80	6.1-8.4	0.0-0.5	1.0-10	0-20
GfA:					
Gilford---------	0-12	5.6-7.3	10-20	24-52	0
	12-27	5.6-7.3	0.0-1.0	4.0-13	0
	27-36	6.1-7.3	0.0-0.5	1.0-9.0	0
	36-80	6.6-8.4	0.0-0.5	1.0-6.0	0-30
GmA:					
Glynwood, limestone substratum-----	0-10	5.1-7.3	1.0-3.0	8.0-22	0
	10-31	4.5-7.8	0.5-1.0	15-35	0-10
	31-40	6.1-8.4	0.0-0.5	11-27	0-25
	40-61	7.4-8.4	0.0-0.5	11-25	22-35
	61-63	---	---	---	---
GnB:					
Glynwood--------	0-9	5.1-7.3	1.0-3.0	8.0-22	0
	9-37	4.5-7.8	0.5-1.0	15-35	0-10
	37-47	6.1-8.4	0.0-0.5	11-27	0-25
	47-80	7.4-8.4	0.0-0.5	11-25	22-35

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
GpB2:					
Glynwood--------	0-7	5.1-7.3	0.5-2.0	12-27	0
	7-31	4.5-7.8	0.5-1.0	15-35	0-10
	31-40	6.1-8.4	0.0-0.5	11-27	0-25
	40-80	7.4-8.4	0.0-0.5	11-25	22-35
GpC2:					
Glynwood--------	0-6	5.1-7.3	0.5-2.0	12-27	0
	6-32	4.5-7.8	0.5-1.0	15-35	0-10
	32-41	6.1-8.4	0.0-0.5	11-27	0-25
	41-80	7.4-8.4	0.0-0.5	11-25	22-35
GsB:					
Glynwood--------	0-7	5.1-7.3	0.5-2.0	12-27	0
	7-36	4.5-7.8	0.5-1.0	15-35	0-10
	36-47	6.1-8.4	0.0-0.5	11-27	0-25
	47-80	7.4-8.4	0.0-0.5	11-25	22-35
Blount----------	0-8	5.1-7.3	2.0-4.0	13-22	0
	8-32	4.5-6.5	0.0-1.0	14-30	0
	32-44	6.1-8.4	0.0-0.5	11-26	0-25
	44-80	7.4-8.4	0.0-0.5	11-25	22-35
Houcktown-------	0-9	5.6-7.3	1.0-3.0	6.0-18	0
	9-37	5.6-7.8	0.5-2.0	7.0-25	0-5
	37-45	6.6-8.4	0.0-0.5	12-23	0-30
	45-80	7.4-8.4	0.0-0.5	9.0-22	20-30
GuB:					
Glynwood--------	0-10	5.1-7.3	1.0-3.0	8.0-22	0
	10-36	4.5-7.8	0.5-1.0	15-35	0-10
	36-49	6.1-8.4	0.0-0.5	11-27	0-25
	49-80	7.4-8.4	0.0-0.5	11-25	22-35
Urban land------	---	---	---	---	---
HaA:					
Harrod----------	0-13	6.6-7.8	3.0-6.0	13-28	0-10
	13-33	6.6-8.4	1.0-3.0	10-26	0-10
	33-35	---	---	---	---
HkA:					
Haskins---------	0-11	5.1-7.3	1.0-2.0	5.0-15	0
	11-37	5.1-7.3	0.0-0.5	7.0-21	0
	37-54	6.1-7.8	0.0-0.5	11-26	0-15
	54-80	7.4-8.4	0.0-0.5	11-26	18-30
HnA:					
Haskins---------	0-9	5.1-7.3	1.0-3.0	6.0-18	0
	9-36	5.1-7.3	0.0-0.5	7.0-21	0
	36-52	6.1-7.8	0.0-0.5	11-26	0-30
	52-80	7.4-8.4	0.0-0.5	11-26	18-30
HpA:					
Houcktown-------	0-8	5.6-7.3	1.0-3.0	6.0-18	0
	8-35	5.6-7.8	0.5-2.0	7.0-25	0-5
	35-51	6.6-8.4	0.0-0.5	12-23	0-30
	51-80	7.4-8.4	0.0-0.5	9.0-22	20-30
HpB:					
Houcktown-------	0-10	5.6-7.3	1.0-3.0	6.0-18	0
	10-30	5.6-7.8	0.5-2.0	7.0-25	0-5
	30-50	6.6-8.4	0.0-0.5	12-23	0-30
	50-80	7.4-8.4	0.0-0.5	9.0-22	20-30
HrB:					
Houcktown-------	0-9	5.6-7.3	1.0-3.0	6.0-18	0
	9-21	5.6-7.8	0.5-2.0	7.0-25	0-5
	21-45	6.6-8.4	0.0-0.5	12-23	0-30
	45-80	7.4-8.4	0.0-0.5	9.0-22	20-30
Glynwood--------	0-7	5.1-7.3	0.5-2.0	12-27	0
	7-36	4.5-7.8	0.5-1.0	15-35	0-10
	36-47	6.1-8.4	0.0-0.5	11-27	0-25
	47-80	7.4-8.4	0.0-0.5	11-25	22-35
Jenera----------	0-8	5.6-7.3	1.0-3.0	6.0-18	0
	8-47	5.6-7.3	0.5-1.0	8.0-23	0
	47-58	6.1-7.8	0.5-1.0	7.0-23	0-15
	58-80	7.4-8.4	0.0-0.5	10-22	15-35

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
HsA:					
Hoytville-------	0-9	6.1-7.3	3.0-6.0	17-35	0
	9-41	6.1-7.8	0.5-1.0	16-32	0-15
	41-60	7.4-8.4	0.5-1.0	14-30	15-30
	60-80	7.4-8.4	0.0-0.5	11-26	15-30
HtA:					
Hoytville-------	0-8	6.1-7.3	3.0-6.0	24-40	0
	8-41	6.1-7.8	0.5-1.0	16-32	0-15
	41-64	7.4-8.4	0.5-1.0	14-30	15-30
	64-80	7.4-8.4	0.0-0.5	11-26	15-30
JeA:					
Jenera----------	0-10	5.6-7.3	1.0-3.0	6.0-18	0
	10-37	5.6-7.3	0.5-1.0	8.0-23	0
	37-50	6.1-7.8	0.5-1.0	7.0-23	0-15
	50-80	7.4-8.4	0.0-0.5	10-22	15-35
JeB:					
Jenera----------	0-8	5.6-7.3	1.0-3.0	6.0-18	0
	8-47	5.6-7.3	0.5-1.0	8.0-23	0
	47-58	6.1-7.8	0.5-1.0	7.0-23	0-15
	58-80	7.4-8.4	0.0-0.5	10-22	15-35
JfB:					
Jenera----------	0-9	5.6-7.3	1.0-3.0	6.0-18	0
	9-21	5.6-7.3	0.5-1.0	8.0-23	0
	21-59	6.1-7.8	0.5-1.0	7.0-23	0-15
	59-80	7.4-8.4	0.0-0.5	10-22	15-35
Shinrock, till substratum-----	0-8	5.6-7.3	1.0-3.0	8.0-22	0
	8-24	5.1-7.8	0.5-1.0	15-29	0-5
	24-40	6.6-8.4	0.0-0.5	3.0-25	0-15
	40-67	7.4-8.4	0.0-0.5	3.0-25	10-25
	67-80	7.4-8.4	0.0-0.5	11-25	20-35
JoA:					
Joliet----------	0-9	6.1-8.4	4.0-5.0	18-26	0-20
	9-18	6.1-8.4	1.0-3.0	6.0-26	0-20
	18-20	---	---	---	---
KnA:					
Knoxdale--------	0-11	6.1-7.3	1.0-3.0	9.0-22	0
	11-47	6.1-7.8	0.5-1.0	7.0-23	0-5
	47-80	6.6-8.4	0.0-0.5	6.0-17	0-20
LbA:					
Lamberjack------	0-11	5.6-7.3	2.0-4.0	8.0-24	0
	11-39	5.6-7.3	1.0-3.0	9.0-27	0
	39-44	6.1-7.8	0.5-1.0	7.0-20	0-5
	44-62	7.4-8.4	0.0-0.5	1.0-10	15-35
	62-80	7.4-8.4	0.0-0.5	8.0-22	15-35
LcA:					
Lamberjack------	0-11	5.6-7.3	2.0-4.0	8.0-24	0
	11-36	5.6-7.3	1.0-3.0	9.0-27	0
	36-45	6.1-7.8	0.5-1.0	7.0-20	0-5
	45-60	7.4-8.4	0.0-0.5	1.0-10	15-35
	60-80	7.4-8.4	0.0-0.5	8.0-22	15-35
Urban land------	---	---	---	---	---
LuB2:					
Lucas----------	0-7	5.1-7.3	1.0-3.0	13-30	0
	7-23	5.1-7.3	0.5-1.0	19-38	0
	23-42	6.1-8.4	0.0-0.5	18-37	0-15
	42-80	7.4-8.4	0.0-0.5	14-37	10-30
LyE:					
Lybrand---------	0-8	5.1-7.3	2.0-4.0	11-24	0
	8-29	5.1-7.8	0.5-2.0	15-31	0-20
	29-47	7.4-8.4	0.0-0.5	11-25	10-35
	47-80	7.4-8.4	0.0-0.5	11-25	20-35
MbA:					
Medway----------	0-12	6.1-7.8	3.0-6.0	13-28	0
	12-50	6.1-7.8	0.5-1.0	7.0-21	0-5
	50-66	6.1-8.4	0.5-1.0	3.0-18	0-10
	66-80	6.1-8.4	0.0-0.5	2.0-18	0-20

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
McA:					
Medway, limestone substratum-----	0-10	6.1-7.8	3.0-6.0	13-28	0
	10-55	6.1-7.8	0.5-1.0	7.0-21	0-5
	55-72	6.1-8.4	0.5-1.0	3.0-18	0-20
	72-74	---	---	---	---
MeA:					
Mermill---------	0-9	5.6-7.3	3.0-6.0	12-28	0
	9-28	5.6-7.3	0.5-1.0	8.0-23	0
	28-57	6.6-8.4	0.0-0.5	11-26	0-30
	57-80	7.4-8.4	0.0-0.5	11-26	15-30
MfA:					
Mermill---------	0-8	5.6-7.3	3.0-6.0	17-31	0
	8-30	5.6-7.3	0.5-1.0	8.0-23	0
	30-47	6.6-8.4	0.0-0.5	11-26	0-30
	47-80	7.4-8.4	0.0-0.5	11-26	15-30
MgA:					
Millsdale-------	0-13	6.1-7.3	4.0-7.0	19-35	0
	13-35	6.1-8.4	0.5-2.0	15-31	0-15
	35-37	---	---	---	---
MnA:					
Milton----------	0-10	5.1-7.3	1.0-3.0	7.0-22	0
	10-21	4.5-7.8	0.5-1.0	15-32	0
	21-29	6.1-7.8	0.0-0.5	10-28	0-15
	29-31	---	---	---	---
MpD3:					
Morley----------	0-6	5.1-7.3	0.5-2.0	12-28	0
	6-14	4.5-7.3	0.5-1.0	15-32	0
	14-39	7.4-8.4	0.5-1.0	12-26	10-20
	39-80	7.4-8.4	0.0-1.0	11-23	20-30
MrA:					
Morley, limestone substratum-----	0-8	5.1-7.3	2.0-3.0	11-22	0
	8-24	4.5-7.3	0.5-1.0	17-27	0
	24-45	7.4-8.4	0.5-1.0	12-23	10-20
	45-66	7.4-8.4	0.0-1.0	9.0-23	15-25
	66-68	---	---	---	---
MsB:					
Morley, limestone substratum-----	0-9	5.1-7.3	2.0-3.0	11-22	0
	9-34	4.5-7.3	0.5-1.0	17-27	0
	34-42	7.4-8.4	0.5-1.0	12-23	10-20
	42-61	7.4-8.4	0.0-1.0	9.0-23	15-25
	61-63	---	---	---	---
Milton----------	0-8	5.1-7.3	1.0-3.0	7.0-22	0
	8-27	4.5-7.8	0.5-1.0	15-32	0
	27-29	6.1-7.8	0.0-0.5	10-28	0-15
	29-31	---	---	---	---
MvB:					
Mortimer--------	0-8	5.1-7.3	1.0-3.0	10-22	0
	8-39	5.1-7.8	0.5-1.0	17-38	0-10
	39-49	7.4-8.4	0.0-0.5	16-37	15-30
	49-80	7.4-8.4	0.0-0.5	16-37	15-30
MwB2:					
Mortimer--------	0-7	5.1-7.3	0.5-2.0	12-27	0
	7-39	5.1-7.8	0.5-1.0	17-38	0-10
	39-52	7.4-8.4	0.0-0.5	16-37	15-30
	52-80	7.4-8.4	0.0-0.5	16-37	15-30
NnA:					
Nappanee--------	0-8	5.1-7.3	1.0-3.0	10-22	0
	8-34	5.1-7.8	0.0-1.0	18-38	0-5
	34-56	7.4-8.4	0.0-0.5	11-26	15-30
	56-80	7.4-8.4	0.0-0.5	11-26	15-30
NnB:					
Nappanee--------	0-8	5.1-7.3	1.0-3.0	10-22	0
	8-31	5.1-7.8	0.0-1.0	18-38	0-5
	31-46	7.4-8.4	0.0-0.5	11-26	15-30
	46-80	7.4-8.4	0.0-0.5	11-26	15-30

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
NpA:					
Nappanee--------	0-8	5.1-7.3	1.0-3.0	13-29	0
	8-40	5.1-7.8	0.0-1.0	18-38	0-5
	40-56	7.4-8.4	0.0-0.5	11-26	15-30
	56-80	7.4-8.4	0.0-0.5	11-26	15-30
NpB2:					
Nappanee--------	0-7	5.1-7.3	0.5-2.0	12-27	0
	7-32	5.1-7.8	0.0-1.0	18-38	0-5
	32-40	7.4-8.4	0.0-0.5	11-26	15-30
	40-80	7.4-8.4	0.0-0.5	11-26	15-30
NrA:					
Nappanee--------	0-8	5.1-7.3	1.0-3.0	10-22	0
	8-34	5.1-7.8	0.0-1.0	18-38	0-5
	34-49	7.4-8.4	0.0-0.5	11-26	15-30
	49-80	7.4-8.4	0.0-0.5	11-26	15-30
Urban land------	---	---	---	---	---
OrA:					
Oshtemo---------	0-9	5.1-7.3	0.5-3.0	2.0-12	0
	9-29	5.1-7.3	0.0-0.5	4.0-12	0
	29-52	5.1-7.3	0.0-0.5	2.0-10	0
	52-80	7.4-8.4	0.0-0.5	0.0-10	10-25
OrB:					
Oshtemo---------	0-10	5.1-7.3	0.5-3.0	2.0-12	0
	10-27	5.1-7.3	0.0-0.5	4.0-12	0
	27-43	5.1-7.3	0.0-0.5	2.0-10	0
	43-80	7.4-8.4	0.0-0.5	0.0-10	10-25
OrC:					
Oshtemo---------	0-8	5.1-7.3	0.5-3.0	2.0-12	0
	8-25	5.1-7.3	0.0-0.5	4.0-12	0
	25-52	5.1-7.3	0.0-0.5	2.0-10	0
	52-80	7.4-8.4	0.0-0.5	0.0-10	10-25
OsB:					
Oshtemo, till substratum-----	0-11	5.1-7.3	0.5-3.0	3.0-15	0
	11-34	5.1-7.3	0.0-0.5	4.0-12	0
	34-44	5.1-7.3	0.0-0.5	2.0-10	0
	44-75	7.4-8.4	0.0-0.5	0.0-10	10-25
	75-80	7.4-8.4	0.0-0.5	11-26	18-30
OwB:					
Ottokee---------	0-11	5.6-7.3	0.5-2.0	2.0-10	0
	11-65	5.6-7.3	0.0-1.0	1.0-9.0	0
	65-80	6.1-8.4	0.0-0.5	1.0-6.0	0-12
PbA:					
Patton----------	0-12	6.1-7.3	3.0-5.0	17-31	0
	12-48	6.1-7.8	1.0-3.0	13-27	0-10
	48-80	7.4-8.4	0.0-1.0	9.0-23	10-25
PmA:					
Pewamo----------	0-11	5.6-7.3	3.0-5.0	17-34	0
	11-53	5.6-7.8	0.5-2.0	15-34	0-5
	53-80	7.4-8.4	0.0-1.0	11-25	15-30
PnA:					
Pewamo----------	0-10	5.6-7.3	3.0-5.0	17-34	0
	10-52	5.6-7.8	0.5-2.0	15-34	0-5
	52-80	7.4-8.4	0.0-1.0	11-25	15-30
Urban land------	---	---	---	---	---
Pt:					
Pits----------	---	---	---	---	---
RcA:					
Randolph--------	0-11	5.1-7.3	1.0-3.0	8.0-22	0
	11-25	5.1-7.8	0.0-0.5	14-31	0-15
	25-27	---	---	---	---
RgB:					
Rawson----------	0-19	5.1-7.3	0.5-3.0	5.0-17	0
	19-32	5.1-7.8	0.5-1.0	8.0-23	0
	32-36	6.1-8.4	0.0-0.5	11-31	0-30
	36-60	7.4-8.4	0.0-0.5	11-26	17-30

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
RhA:					
Rensselaer, till substratum-----	0-12	6.1-7.3	2.0-6.0	10-29	0
	12-46	6.1-7.3	0.5-2.0	9.0-25	0
	46-54	6.6-7.8	0.0-1.0	8.0-23	0-10
	54-63	7.4-8.4	0.0-0.5	1.0-13	5-25
	63-80	7.4-8.4	0.0-0.5	11-25	15-35
RnA:					
Rimer----------	0-10	5.1-7.3	1.0-3.0	3.0-15	0
	10-23	5.1-7.3	0.5-1.0	3.0-11	0
	23-28	5.1-7.3	0.0-0.5	3.0-12	0
	28-54	6.1-7.8	0.0-0.5	12-28	0-15
	54-80	7.4-8.4	0.0-0.5	11-26	10-30
RoA:					
Rimer, deep phase----------	0-11	5.1-7.3	1.0-3.0	3.0-15	0
	11-24	5.1-7.3	0.5-1.0	3.0-11	0
	24-45	5.1-7.3	0.5-1.0	3.0-12	0
	45-52	5.1-7.8	0.0-0.5	2.0-10	0-15
	52-80	7.4-8.4	0.0-0.5	10-22	10-30
RtA:					
Rossburg--------	0-13	6.1-7.8	4.0-8.0	13-32	0
	13-56	6.1-7.8	0.5-2.0	7.0-20	0-10
	56-80	6.6-8.4	0.0-0.5	2.0-10	0-30
SeA:					
Shawtown--------	0-9	5.1-7.3	1.0-3.0	7.0-22	0
	9-53	5.1-7.3	0.0-0.5	7.0-22	0
	53-66	7.4-8.4	0.0-0.5	1.0-10	15-25
	66-80	7.4-8.4	0.0-0.5	9.0-25	15-30
SeB:					
Shawtown--------	0-9	5.1-7.3	1.0-3.0	7.0-22	0
	9-55	5.1-7.3	0.0-0.5	7.0-22	0
	55-63	7.4-8.4	0.0-0.5	1.0-10	15-25
	63-80	7.4-8.4	0.0-0.5	9.0-25	15-30
SfB:					
Shinrock--------	0-8	5.6-7.3	1.0-3.0	8.0-22	0
	8-36	5.1-7.8	0.5-1.0	15-29	0-5
	36-50	6.6-8.4	0.0-0.5	3.0-25	0-15
	50-80	7.4-8.4	0.0-0.5	3.0-25	10-25
SgC2:					
Shinrock--------	0-7	5.6-7.3	0.5-2.0	12-28	0-5
	7-34	5.1-7.8	0.5-1.0	15-29	0-5
	34-51	6.6-8.4	0.0-0.5	3.0-25	0-15
	51-80	7.4-8.4	0.0-0.5	3.0-25	10-25
SkB:					
Shinrock, till substratum-----	0-10	5.6-7.3	1.0-3.0	8.0-22	0
	10-26	5.1-7.8	0.5-1.0	15-29	0-5
	26-43	6.6-8.4	0.0-0.5	3.0-25	0-15
	43-62	7.4-8.4	0.0-0.5	3.0-25	10-25
	62-80	7.4-8.4	0.0-0.5	11-25	22-35
Glynwood--------	0-8	5.1-7.3	0.5-2.0	12-27	0
	8-26	4.5-7.8	0.5-1.0	15-35	0-10
	26-39	6.1-8.4	0.0-0.5	11-27	0-25
	39-80	7.4-8.4	0.0-0.5	11-25	22-35
SmA:					
Shoals----------	0-11	6.6-7.8	2.0-4.0	12-27	0-5
	11-59	6.6-8.4	0.5-2.0	8.0-24	0-10
	59-80	6.6-8.4	0.5-2.0	3.0-19	0-25
SnA:					
Sloan----------	0-11	6.1-7.8	3.0-6.0	12-28	0-5
	11-46	6.1-8.4	0.5-1.0	10-23	0-20
	46-80	6.6-8.4	0.0-0.5	4.0-19	0-40
SoA:					
Sloan----------	0-11	6.1-7.8	3.0-6.0	17-33	0-5
	11-58	6.1-8.4	0.5-1.0	10-23	0-20
	58-80	6.6-8.4	0.0-0.5	4.0-19	0-40

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
SpA:					
Sloan, limestone substratum-----	0-10	6.1-7.8	3.0-6.0	17-33	0-5
	10-39	6.1-8.4	0.5-1.0	10-23	0-20
	39-71	6.6-8.4	0.0-0.5	4.0-19	0-40
	71-73	---	---	---	---
StB2:					
St. Clair-------	0-4	5.6-7.3	0.5-2.0	12-28	0
	4-37	5.6-7.8	0.0-0.5	16-37	0-10
	37-48	7.4-8.4	0.0-0.5	14-34	15-30
	48-80	7.4-8.4	0.0-0.5	14-34	15-30
StC2:					
St. Clair-------	0-6	5.6-7.3	0.5-2.0	12-28	0
	6-35	5.6-7.8	0.0-0.5	16-37	0-10
	35-42	7.4-8.4	0.0-0.5	14-34	15-30
	42-80	7.4-8.4	0.0-0.5	14-34	15-30
ThA:					
Thackery, till substratum-----	0-10	5.6-7.3	1.0-3.0	8.0-22	0
	10-25	5.1-7.3	0.5-1.0	9.0-21	0
	25-56	5.1-7.8	0.0-0.5	8.0-22	0-10
	56-69	7.4-8.4	0.0-0.5	1.0-10	10-35
	69-80	7.4-8.4	0.0-0.5	8.0-22	20-35
TkA:					
Tiderishi-------	0-11	5.1-7.3	3.0-5.0	12-25	0
	11-42	5.1-7.3	0.5-1.0	8.0-23	0
	42-57	6.1-7.8	0.0-0.5	6.0-20	0-15
	57-80	7.4-8.4	0.0-0.5	10-22	15-35
TnA:					
Toledo----------	0-9	5.6-7.3	3.0-6.0	17-36	0
	9-50	6.1-7.8	0.5-1.0	17-38	0-5
	50-80	7.4-8.4	0.0-0.5	14-37	8-22
ToB:					
Tuscola---------	0-10	5.6-7.3	1.0-2.0	4.0-13	0
	10-55	5.6-7.8	0.0-0.5	7.0-22	0-10
	55-80	7.4-8.4	0.0-0.5	2.0-22	5-25
TpA:					
Tuscola---------	0-8	5.6-7.3	1.0-3.0	5.0-18	0
	8-40	5.6-7.8	0.0-0.5	7.0-22	0-10
	40-80	7.4-8.4	0.0-0.5	2.0-22	5-25
TpB:					
Tuscola---------	0-11	5.6-7.3	1.0-3.0	5.0-18	0
	11-44	5.6-7.8	0.0-0.5	7.0-22	0-10
	44-80	7.4-8.4	0.0-0.5	2.0-22	5-25
TuB:					
Tuscola---------	0-9	5.6-7.3	1.0-3.0	5.0-18	0
	9-43	5.6-7.8	0.0-0.5	7.0-22	0-10
	43-80	7.4-8.4	0.0-0.5	2.0-22	5-25
UcA:					
Udorthents------	---	---	---	---	---
UcD:					
Udorthents------	---	---	---	---	---
Ur:					
Urban land------	---	---	---	---	---
VaA:					
Vanlue----------	0-10	5.6-7.3	1.0-3.0	6.0-21	0
	10-35	5.6-7.3	0.5-1.0	8.0-23	0
	35-59	6.6-8.4	0.0-0.5	4.0-22	0-30
	59-80	7.4-8.4	0.0-0.5	9.0-22	15-35
VeA:					
Vaughnsville----	0-8	6.1-7.3	1.0-3.0	9.0-22	0
	8-20	6.1-7.3	0.5-1.0	8.0-23	0
	20-36	6.1-7.8	0.0-0.5	2.0-19	0-10
	36-45	7.4-8.4	0.0-0.5	11-27	5-25
	45-80	7.4-8.4	0.0-0.5	11-27	15-30
W:					
Water----------	---	---	---	---	---

TABLE 30.--CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
WeA:					
Westland--------	0-10	6.1-7.3	2.0-5.0	10-26	0
	10-52	6.1-7.3	0.5-2.0	10-25	0
	52-59	6.6-7.8	0.5-2.0	3.0-22	0-25
	59-80	7.4-8.4	0.0-0.5	0.0-7.0	25-45
Rensselaer------	0-19	6.1-7.3	2.0-6.0	10-29	0
	19-38	6.1-7.3	0.5-2.0	9.0-25	0
	38-58	6.6-7.8	0.0-1.0	8.0-23	0-10
	58-80	7.4-8.4	0.0-0.5	1.0-13	5-25

TABLE 31.--WATER FEATURES

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
AdA:										
Adrian----------	A									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	---
AkA:										
Alvada----------	B									
		January	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		November	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
AmA:										
Alvada----------	B									
		January	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		November	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
AnA:										
Aquents---------	---									
		January	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		February	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		March	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		April	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		May	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		November	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
		December	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Long	Frequent	---	---
ApB:										
Arkport---------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
ArA:										
Aurand----------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
AsA:										
Aurand----------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
BgA:										
Biglick---------	D									
		January	>1.7	>1.7	---	---	---	---	---	---
		February	>1.7	>1.7	---	---	---	---	---	---
		March	>1.7	>1.7	---	---	---	---	---	---
		April	>1.7	>1.7	---	---	---	---	---	---
		May	>1.7	>1.7	---	---	---	---	---	---
		June	>1.7	>1.7	---	---	---	---	---	---
		July	>1.7	>1.7	---	---	---	---	---	---
		August	>1.7	>1.7	---	---	---	---	---	---
		September	>1.7	>1.7	---	---	---	---	---	---
		October	>1.7	>1.7	---	---	---	---	---	---
		November	>1.7	>1.7	---	---	---	---	---	---
		December	>1.7	>1.7	---	---	---	---	---	---
Milton----------	C									
		January	>3.3	>3.3	---	---	---	---	---	---
		February	>3.3	>3.3	---	---	---	---	---	---
		March	>3.3	>3.3	---	---	---	---	---	---
		April	>3.3	>3.3	---	---	---	---	---	---
		May	>3.3	>3.3	---	---	---	---	---	---
		June	>3.3	>3.3	---	---	---	---	---	---
		July	>3.3	>3.3	---	---	---	---	---	---
		August	>3.3	>3.3	---	---	---	---	---	---
		September	>3.3	>3.3	---	---	---	---	---	---
		October	>3.3	>3.3	---	---	---	---	---	---
		November	>3.3	>3.3	---	---	---	---	---	---
		December	>3.3	>3.3	---	---	---	---	---	---
BgB:										
Biglick---------	D									
		January	>1.7	>1.7	---	---	---	---	---	---
		February	>1.7	>1.7	---	---	---	---	---	---
		March	>1.7	>1.7	---	---	---	---	---	---
		April	>1.7	>1.7	---	---	---	---	---	---
		May	>1.7	>1.7	---	---	---	---	---	---
		June	>1.7	>1.7	---	---	---	---	---	---
		July	>1.7	>1.7	---	---	---	---	---	---
		August	>1.7	>1.7	---	---	---	---	---	---
		September	>1.7	>1.7	---	---	---	---	---	---
		October	>1.7	>1.7	---	---	---	---	---	---
		November	>1.7	>1.7	---	---	---	---	---	---
		December	>1.7	>1.7	---	---	---	---	---	---
Milton----------	C									
		January	>3.3	>3.3	---	---	---	---	---	---
		February	>3.3	>3.3	---	---	---	---	---	---
		March	>3.3	>3.3	---	---	---	---	---	---
		April	>3.3	>3.3	---	---	---	---	---	---
		May	>3.3	>3.3	---	---	---	---	---	---
		June	>3.3	>3.3	---	---	---	---	---	---
		July	>3.3	>3.3	---	---	---	---	---	---
		August	>3.3	>3.3	---	---	---	---	---	---
		September	>3.3	>3.3	---	---	---	---	---	---
		October	>3.3	>3.3	---	---	---	---	---	---
		November	>3.3	>3.3	---	---	---	---	---	---
		December	>3.3	>3.3	---	---	---	---	---	---
BnA:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
BoA:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
BoB:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
BpA:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
Houcktown-------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		November	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
BrA:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
Jenera----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
BuA:										
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
ChC:										
Channahon-------	D									
		January	>1.7	>1.7	---	---	---	---	---	---
		February	>1.7	>1.7	---	---	---	---	---	---
		March	>1.7	>1.7	---	---	---	---	---	---
		April	>1.7	>1.7	---	---	---	---	---	---
		May	>1.7	>1.7	---	---	---	---	---	---
		June	>1.7	>1.7	---	---	---	---	---	---
		July	>1.7	>1.7	---	---	---	---	---	---
		August	>1.7	>1.7	---	---	---	---	---	---
		September	>1.7	>1.7	---	---	---	---	---	---
		October	>1.7	>1.7	---	---	---	---	---	---
		November	>1.7	>1.7	---	---	---	---	---	---
		December	>1.7	>1.7	---	---	---	---	---	---
Biglick---------	D									
		January	>1.7	>1.7	---	---	---	---	---	---
		February	>1.7	>1.7	---	---	---	---	---	---
		March	>1.7	>1.7	---	---	---	---	---	---
		April	>1.7	>1.7	---	---	---	---	---	---
		May	>1.7	>1.7	---	---	---	---	---	---
		June	>1.7	>1.7	---	---	---	---	---	---
		July	>1.7	>1.7	---	---	---	---	---	---
		August	>1.7	>1.7	---	---	---	---	---	---
		September	>1.7	>1.7	---	---	---	---	---	---
		October	>1.7	>1.7	---	---	---	---	---	---
		November	>1.7	>1.7	---	---	---	---	---	---
		December	>1.7	>1.7	---	---	---	---	---	---
CoA:										
Colwood---------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Very brief	Occasional	---	---
CtA:										
Cygnet----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
CuA:										
Cygnet----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
DbA:										
Darroch---------	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		February	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		March	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		April	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		December	1.0-2.0	>6.0	Apparent	---	---	---	---	---
DeA:										
Del Rey---------	C									
		January	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
DfA:										
Del Rey---------	C									
		January	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-2.0	3.3-5.0	Perched	---	---	---	---	---
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
DuB:										
Dunbridge-------	B									
		January	>3.3	>3.3	---	---	---	---	---	---
		February	>3.3	>3.3	---	---	---	---	---	---
		March	>3.3	>3.3	---	---	---	---	---	---
		April	>3.3	>3.3	---	---	---	---	---	---
		May	>3.3	>3.3	---	---	---	---	---	---
		June	>3.3	>3.3	---	---	---	---	---	---
		July	>3.3	>3.3	---	---	---	---	---	---
		August	>3.3	>3.3	---	---	---	---	---	---
		September	>3.3	>3.3	---	---	---	---	---	---
		October	>3.3	>3.3	---	---	---	---	---	---
		November	>3.3	>3.3	---	---	---	---	---	---
		December	>3.3	>3.3	---	---	---	---	---	---
EmA:										
Elliott---------	C									
		January	1.0-2.0	2.7-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.7-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.7-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.7-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.7-4.5	Perched	---	---	---	---	---
FbA:										
Flatrock--------	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	Very brief	Occasional
		February	1.0-2.0	>6.0	Apparent	---	---	---	Very brief	Occasional
		March	1.0-2.0	>6.0	Apparent	---	---	---	Very brief	Occasional
		April	1.0-2.0	>6.0	Apparent	---	---	---	Very brief	Occasional
		December	1.0-2.0	>6.0	Apparent	---	---	---	Very brief	Occasional
FcA:										
Flatrock--------	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		February	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		March	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		April	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		December	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
FdA:										
Flatrock, limestone substratum-----	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		February	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		March	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		April	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		December	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
FoA:										
Fox----------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
FoB:										
Fox----------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
FoC2:										
Fox----------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
FsA:										
Fulton----------	D									
		January	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
FtA:										
Fulton, till substratum-----	D									
		January	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	3.3-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
GaB:										
Gallman---------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
GfA:										
Gilford---------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-0.5	Very brief	Occasional	---	---
GmA:										
Glynwood, limestone substratum-----	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
GnB:										
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
GpB2:										
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
GpC2:										
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
GsB:										
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
Blount----------	C									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
Houcktown-------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		November	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
GuB:										
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
HaA:										
Harrod----------	B									
		January	1.0-2.0	>3.3	Apparent	---	---	---	Brief	Frequent
		February	1.0-2.0	>3.3	Apparent	---	---	---	Brief	Frequent
		March	1.0-2.0	>3.3	Apparent	---	---	---	Brief	Frequent
		April	1.0-2.0	>3.3	Apparent	---	---	---	Brief	Frequent
		May	---	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Brief	Frequent
		December	1.0-2.0	>3.3	Apparent	---	---	---	Brief	Frequent
HkA:										
Haskins---------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		November	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
HnA:										
Haskins---------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		November	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
HpA:										
Houcktown-------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		November	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
HpB:										
Houcktown-------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		November	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
HrB:										
Houcktown-------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		November	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
Jenera----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
HsA:										
Hoytville-------	C									
		January	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
HtA:										
Hoytville-------	C									
		January	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	3.3-5.0	Perched	0.0-1.0	Brief	Frequent	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
JeA:										
Jenera----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
JeB:										
Jenera----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
JfB:										
Jenera----------	B									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
Shinrock, till substratum-----	C									
		January	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		December	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
JoA:										
Joliet----------	D									
		January	0.0-1.0	>1.7	Apparent	---	---	---	---	---
		February	0.0-1.0	>1.7	Apparent	---	---	---	---	---
		March	0.0-1.0	>1.7	Apparent	---	---	---	---	---
		April	0.0-1.0	>1.7	Apparent	---	---	---	---	---
		May	0.0-1.0	>1.7	Apparent	---	---	---	---	---
		December	0.0-1.0	>1.7	Apparent	---	---	---	---	---
KnA:										
Knoxdale--------	B									
		January	3.5-6.0	>6.0	Apparent	---	---	---	Brief	Occasional
		February	3.5-6.0	>6.0	Apparent	---	---	---	Brief	Occasional
		March	3.5-6.0	>6.0	Apparent	---	---	---	Brief	Occasional
		April	3.5-6.0	>6.0	Apparent	---	---	---	Brief	Occasional
		December	3.5-6.0	>6.0	Apparent	---	---	---	Brief	Occasional
LbA:										
Lamberjack------	B									
		January	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		February	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		March	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		April	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		November	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		December	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
LcA:										
Lamberjack------	B									
		January	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		February	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		March	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		April	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		November	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
		December	0.5-1.5	5.0-6.6	Perched	---	---	---	---	---
LuB2:										
Lucas-----------	D									
		January	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		February	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		March	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		April	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
LyE:										
Lybrand---------	C									
		February	3.3-5.0	3.5-5.0	Perched	---	---	---	---	---
		March	3.3-5.0	3.5-5.0	Perched	---	---	---	---	---
		April	3.3-5.0	3.5-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
MbA:										
Medway----------	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		February	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		March	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		April	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		May	---	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Brief	Occasional
		December	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
McA:										
Medway, limestone substratum-----	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		February	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		March	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		April	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
		May	---	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Brief	Occasional
		December	1.0-2.0	>6.0	Apparent	---	---	---	Brief	Occasional
MeA:										
Mermill---------	B									
		January	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
MfA:										
Mermill---------	B									
		January	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	3.0-5.0	Perched	0.0-1.0	Brief	Occasional	---	---
MgA:										
Millsdale-------	C									
		January	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		November	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	>3.3	Apparent	0.0-1.0	Brief	Occasional	---	---
MnA:										
Milton----------	C									
		January	>3.3	>3.3	---	---	---	---	---	---
		February	>3.3	>3.3	---	---	---	---	---	---
		March	>3.3	>3.3	---	---	---	---	---	---
		April	>3.3	>3.3	---	---	---	---	---	---
		May	>3.3	>3.3	---	---	---	---	---	---
		June	>3.3	>3.3	---	---	---	---	---	---
		July	>3.3	>3.3	---	---	---	---	---	---
		August	>3.3	>3.3	---	---	---	---	---	---
		September	>3.3	>3.3	---	---	---	---	---	---
		October	>3.3	>3.3	---	---	---	---	---	---
		November	>3.3	>3.3	---	---	---	---	---	---
		December	>3.3	>3.3	---	---	---	---	---	---
MpD3:										
Morley----------	C									
		January	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		February	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		March	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		April	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
MrA:										
Morley, limestone substratum-----	C									
		January	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		February	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		March	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		April	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
MsB:										
Morley, limestone substratum-----	C									
		January	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		February	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		March	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
		April	2.0-3.5	2.5-3.5	Perched	---	---	---	---	---
Milton----------	C									
		January	>3.3	>3.3	---	---	---	---	---	---
		February	>3.3	>3.3	---	---	---	---	---	---
		March	>3.3	>3.3	---	---	---	---	---	---
		April	>3.3	>3.3	---	---	---	---	---	---
		May	>3.3	>3.3	---	---	---	---	---	---
		June	>3.3	>3.3	---	---	---	---	---	---
		July	>3.3	>3.3	---	---	---	---	---	---
		August	>3.3	>3.3	---	---	---	---	---	---
		September	>3.3	>3.3	---	---	---	---	---	---
		October	>3.3	>3.3	---	---	---	---	---	---
		November	>3.3	>3.3	---	---	---	---	---	---
		December	>3.3	>3.3	---	---	---	---	---	---
MvB:										
Mortimer--------	D									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
MwB2:										
Mortimer--------	D									
		January	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
		December	1.0-2.0	3.3-5.0	Perched	---	---	---	---	---
NnA:										
Nappanee--------	D									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
NnB:										
Nappanee--------	D									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
NpA:										
Nappanee--------	D									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
NpB2:										
Nappanee--------	D									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
NrA:										
Nappanee--------	D									
		January	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		February	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		March	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		April	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		May	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		November	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
		December	0.5-1.0	2.5-5.0	Perched	---	---	---	---	---
OrA:										
Oshtemo---------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
OrB:										
Oshtemo---------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
OrC:										
Oshtemo---------	B									
		January	>6.0	>6.0	---	---	---	---	---	---
		February	>6.0	>6.0	---	---	---	---	---	---
		March	>6.0	>6.0	---	---	---	---	---	---
		April	>6.0	>6.0	---	---	---	---	---	---
		May	>6.0	>6.0	---	---	---	---	---	---
		June	>6.0	>6.0	---	---	---	---	---	---
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	---	---
		December	>6.0	>6.0	---	---	---	---	---	---
OsB:										
Oshtemo, till substratum-----	B									
		January	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
		February	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
		March	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
		April	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
		May	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
		December	3.5-6.0	5.0-6.6	Perched	---	---	---	---	---
OwB:										
Ottokee---------	A									
		January	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		February	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		March	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		April	2.0-3.5	>6.0	Apparent	---	---	---	---	---
PbA:										
Patton----------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
PmA:										
Pewamo----------	C									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
PnA:										
Pewamo----------	C									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
RcA:										
Randolph--------	C									
		January	0.5-1.0	>3.3	Apparent	---	---	---	---	---
		February	0.5-1.0	>3.3	Apparent	---	---	---	---	---
		March	0.5-1.0	>3.3	Apparent	---	---	---	---	---
		April	0.5-1.0	>3.3	Apparent	---	---	---	---	---
RgB:										
Rawson----------	B									
		January	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		February	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		March	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
		April	2.0-3.5	2.5-4.0	Perched	---	---	---	---	---
RhA:										
Rensselaer, till substratum-----	B									
		January	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	5.0-6.6	Perched	0.0-1.0	Brief	Occasional	---	---
RnA:										
Rimer----------	C									
		January	0.5-1.5	3.0-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.0-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.0-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.0-5.0	Perched	---	---	---	---	---
RoA:										
Rimer, deep phase----------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
RtA:										
Rossburg--------	B									
		January	>6.0	>6.0	---	---	---	---	Brief	Occasional
		February	>6.0	>6.0	---	---	---	---	Brief	Occasional
		March	>6.0	>6.0	---	---	---	---	Brief	Occasional
		April	>6.0	>6.0	---	---	---	---	Brief	Occasional
		May	>6.0	>6.0	---	---	---	---	Brief	Occasional
		June	>6.0	>6.0	---	---	---	---	Brief	Occasional
		July	>6.0	>6.0	---	---	---	---	---	---
		August	>6.0	>6.0	---	---	---	---	---	---
		September	>6.0	>6.0	---	---	---	---	---	---
		October	>6.0	>6.0	---	---	---	---	---	---
		November	>6.0	>6.0	---	---	---	---	Brief	Occasional
		December	>6.0	>6.0	---	---	---	---	Brief	Occasional
SeA:										
Shawtown--------	B									
		January	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		February	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		March	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		April	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		December	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
SeB:										
Shawtown--------	B									
		January	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		February	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		March	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		April	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
		December	2.0-3.5	4.2-5.8	Perched	---	---	---	---	---
SfB:										
Shinrock--------	C									
		January	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		December	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
SgC2:										
Shinrock--------	C									
		January	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		December	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
SkB:										
Shinrock, till substratum-----	C									
		January	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
		December	1.0-2.0	2.5-4.5	Perched	---	---	---	---	---
Glynwood--------	C									
		January	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		February	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		March	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
		April	1.0-2.0	2.1-4.2	Perched	---	---	---	---	---
SmA:										
Shoals----------	C									
		January	0.5-1.5	>6.0	Apparent	---	---	---	Brief	Occasional
		February	0.5-1.5	>6.0	Apparent	---	---	---	Brief	Occasional
		March	0.5-1.5	>6.0	Apparent	---	---	---	Brief	Occasional
		April	0.5-1.5	>6.0	Apparent	---	---	---	Brief	Occasional
		May	---	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Brief	Occasional
		December	---	---	---	---	---	---	Brief	Occasional
SnA:										
Sloan----------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		June	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
SoA:										
Sloan----------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		June	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
SpA:										
Sloan, limestone substratum-----	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		June	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	Brief	Occasional
StB2:										
St. Clair-------	D									
		January	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		February	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		March	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		April	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
StC2:										
St. Clair-------	D									
		January	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		February	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		March	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
		April	2.0-3.0	2.1-4.6	Perched	---	---	---	---	---
ThA:										
Thackery, till substratum-----	B									
		January	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
		February	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
		March	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
		April	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
		May	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
		December	1.0-2.5	5.0-6.6	Perched	---	---	---	---	---
TkA:										
Tiderishi-------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		November	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
TnA:										
Toledo----------	D									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	---	---	---	---	---
		November	0.0-1.0	>6.0	Apparent	---	---	---	---	---
		December	0.0-1.0	>6.0	Apparent	---	---	---	---	---
ToB:										
Tuscola---------	B									
		January	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		February	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		March	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		April	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		November	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		December	1.5-2.5	>6.0	Apparent	---	---	---	---	---
TpA:										
Tuscola---------	B									
		January	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		February	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		March	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		April	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		November	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		December	1.5-2.5	>6.0	Apparent	---	---	---	---	---
TpB:										
Tuscola---------	B									
		January	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		February	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		March	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		April	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		November	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		December	1.5-2.5	>6.0	Apparent	---	---	---	---	---

TABLE 31.--WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
TuB:										
Tuscola---------	B									
		January	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		February	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		March	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		April	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		November	1.5-2.5	>6.0	Apparent	---	---	---	---	---
		December	1.5-2.5	>6.0	Apparent	---	---	---	---	---
VaA:										
Vanlue----------	C									
		January	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		February	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		March	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		April	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
		December	0.5-1.5	3.3-5.0	Perched	---	---	---	---	---
VeA:										
Vaughnsville----	B									
		January	2.0-3.5	3.3-5.0	Perched	---	---	---	---	---
		February	2.0-3.5	3.3-5.0	Perched	---	---	---	---	---
		March	2.0-3.5	3.3-5.0	Perched	---	---	---	---	---
		April	2.0-3.5	3.3-5.0	Perched	---	---	---	---	---
W:										
Water----------	---									
		Jan-Dec	>6.0	>6.0	---	---	None	---	None	
WeA:										
Westland--------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
Rensselaer------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	---	---

TABLE 32.--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				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
AdA:									
Adrian	---	> 80	---	---	6-18	29-33	High	High	Moderate.
AkA:									
Alvada	---	> 80	---	---	---	---	High	High	Low.
AmA:									
Alvada	---	> 80	---	---	---	---	High	High	Low.
Urban land	---	---	---	---		---	---	---	---
AnA:									
Aquents	---	> 80	---	---		---	High	High	Low.
ApB:									
Arkport	---	> 80	---	---	---	---	Moderate	Low	Moderate.
ArA:									
Aurand	Dense material	40- 60	---	---	---	---	High	High	Moderate.
AsA:									
Aurand	Dense material	40- 60	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
BgA:									
Biglick	Bedrock (lithic)	10- 20	---	---	---	---	Moderate	High	Low.
Milton	Bedrock (lithic)	20- 40	---	---	---	---	Moderate	High	Moderate.
BgB:									
Biglick	Bedrock (lithic)	10- 20	---	---	---	---	Moderate	High	Low.
Milton	Bedrock (lithic)	20- 40	---	---	---	---	Moderate	High	Moderate.
BnA:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
BoA:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
BoB:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
BpA:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
Houcktown	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
BrA:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
Jenera	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
BuA:									
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
ChC:									
Channahon	Bedrock (lithic)	10- 20	---	---	---	---	Moderate	Low	Low.
Biglick	Bedrock (lithic)	10- 20	---	---	---	---	Moderate	High	Low.
CoA:									
Colwood	---	> 80	---	---	---	---	High	High	Low.
CtA:									
Cygnet	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
CuA:									
Cygnet	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
Urban land	---	---	---	---		---	---	---	---
DbA:									
Darroch	---	> 80	---	---	---	---	High	High	Moderate.
DeA:									
Del Rey	---	> 80	---	---	---	---	High	High	Moderate.

TABLE 32.--SOIL FEATURES--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
DfA:									
Del Rey	---	> 80	---	---	---	---	High	High	Moderate.
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
DuB:									
Dunbridge	Bedrock (lithic)	20- 40	---	---	---	---	Moderate	Low	Low.
EmA:									
Elliott	Dense material	32- 55	---	---	---	---	High	High	Moderate.
FbA:									
Flatrock	---	> 80	---	---	---	---	High	Moderate	Low.
FcA:									
Flatrock	---	> 80	---	---	---	---	High	Moderate	Low.
FdA:									
Flatrock, limestone substratum	Bedrock (lithic)	60- 80	---	---	---	---	High	Moderate	Low.
FoA:									
Fox	---	> 80	---	---	---	---	Moderate	Low	Moderate.
FoB:									
Fox	---	> 80	---	---	---	---	Moderate	Low	Moderate.
FoC2:									
Fox	---	> 80	---	---	---	---	Moderate	Low	Moderate.
FsA:									
Fulton	---	> 80	---	---	---	---	High	High	Moderate.
FtA:									
Fulton, till substratum	Dense material	60- 80	---	---	---	---	High	High	Moderate.
GaB:									
Gallman	---	> 80	---	---	---	---	Moderate	Low	Moderate.
GfA:									
Gilford	---	> 80	---	---	---	---	High	High	Moderate.
GmA:									
Glynwood, limestone substratum	Dense material	25- 50	---	---	---	---	High	High	Moderate.
	Bedrock (lithic)	60- 80							
GnB:									
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
GpB2:									
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
GpC2:									
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
GsB:									
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
Blount	Dense material	30- 60	---	---	---	---	High	High	Moderate.
Houcktown	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
GuB:									
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
HaA:									
Harrod	Bedrock (lithic)	20- 40	---	---	---	---	High	High	Low.
HkA:									
Haskins	Dense material	40- 60	---	---	---	---	High	High	Moderate.
HnA:									
Haskins	Dense material	40- 60	---	---	---	---	High	High	Moderate.
HpA:									
Houcktown	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
HpB:									
Houcktown	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.

TABLE 32.--SOIL FEATURES--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
HrB:									
Houcktown	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.
Jenera	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
HsA:									
Hoytville	Dense material	40- 65	---	---	---	---	High	High	Low.
HtA:									
Hoytville	Dense material	40- 65	---	---	---	---	High	High	Low.
JeA:									
Jenera	---	> 80	---	---	---	---	High	Moderate	Moderate.
JeB:									
Jenera	---	> 80	---	---	---	---	High	Moderate	Moderate.
JfB:									
Jenera	Dense material	40- 60	---	---	---	---	High	Moderate	Moderate.
Shinrock, till substratum	Dense material	60- 80	---	---	---	---	High	High	Moderate.
JoA:									
Joliet	Bedrock (lithic)	10- 20	---	---	---	---	High	High	Low.
KnA:									
Knoxdale	---	> 80	---	---	---	---	Moderate	Low	Low.
LbA:									
Lamberjack	Dense material	60- 80	---	---	---	---	High	High	Moderate.
LcA:									
Lamberjack	Dense material	60- 80	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
LuB2:									
Lucas	---	> 80	---	---	---	---	Moderate	High	Moderate.
LyE:									
Lybrand	Dense material	40- 60	---	---	---	---	Moderate	High	Moderate.
MbA:									
Medway	---	> 80	---	---	---	---	High	High	Low.
McA:									
Medway, limestone substratum	Bedrock (lithic)	60- 80	---	---	---	---	High	High	Low.
MeA:									
Mermill	---	> 80	---	---	---	---	High	High	Moderate.
MfA:									
Mermill	---	> 80	---	---	---	---	High	High	Moderate.
MgA:									
Millsdale	Bedrock (lithic)	20- 40	---	---	---	---	High	High	Low.
MnA:									
Milton	Bedrock (lithic)	20- 40	---	---	---	---	Moderate	High	Moderate.
MpD3:									
Morley	Dense material	20- 40	---	---	---	---	Moderate	High	Moderate.
MrA:									
Morley, limestone substratum	Dense material	40- 60	---	---	---	---	Moderate	High	Moderate.
	Bedrock (lithic)	60- 80							
MsB:									
Morley, limestone substratum	Dense material	40- 60	---	---	---	---	Moderate	High	Moderate.
	Bedrock (lithic)	60- 80							
Milton	Bedrock (lithic)	20- 40	---	---	---	---	Moderate	High	Moderate.
MvB:									
Mortimer	Dense material	40- 60	---	---	---	---	High	High	Moderate.
MwB2:									
Mortimer	Dense material	40- 60	---	---	---	---	High	High	Moderate.

TABLE 32.--SOIL FEATURES--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
NnA:									
Nappanee	Dense material	40- 60	---	---	---	---	High	High	Moderate.
NnB:									
Nappanee	Dense material	40- 60	---	---	---	---	High	High	Moderate.
NpA:									
Nappanee	Dense material	40- 60	---	---	---	---	High	High	Moderate.
NpB2:									
Nappanee	Dense material	40- 60	---	---	---	---	High	High	Moderate.
NrA:									
Nappanee	Dense material	40- 60	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
OrA:									
Oshtemo	---	> 80	---	---	---	---	Moderate	Low	Moderate.
OrB:									
Oshtemo	---	> 80	---	---	---	---	Moderate	Low	Moderate.
OrC:									
Oshtemo	---	> 80	---	---	---	---	Moderate	Low	Moderate.
OsB:									
Oshtemo, till substratum	Dense material	60- 80	---	---	---	---	Moderate	Low	Moderate.
OwB:									
Ottokee	---	> 80	---	---	---	---	Moderate	Low	Moderate.
PbA:									
Patton	---	> 80	---	---	---	---	High	High	Low.
PmA:									
Pewamo	---	> 80	---	---	---	---	High	High	Moderate.
PnA:									
Pewamo	---	> 80	---	---	---	---	High	High	Moderate.
Urban land	---	---	---	---		---	---	---	---
Pt:									
Pits	---	---	---	---		---	---	---	---
RcA:									
Randolph	Bedrock (lithic)	20- 40	---	---	---	---	High	High	Moderate.
RgB:									
Rawson	Dense material	24- 48	---	---	---	---	Moderate	Moderate	Moderate.
RhA:									
Rensselaer, till substratum	---	> 80	---	---	---	---	High	High	Low.
RnA:									
Rimer	Dense material	40- 60	---	---	---	---	High	High	Moderate.
RoA:									
Rimer, deep phase	---	> 80	---	---	---	---	High	High	Moderate.
RtA:									
Rossburg	---	> 80	---	---	---	---	Moderate	Low	Low.
SeA:									
Shawtown	Dense material	50- 70	---	---	---	---	Moderate	Low	Moderate.
SeB:									
Shawtown	Dense material	50- 70	---	---	---	---	Moderate	Low	Moderate.
SfB:									
Shinrock	---	> 80	---	---	---	---	High	High	Moderate.
SgC2:									
Shinrock	---	> 80	---	---	---	---	High	High	Moderate.
SkB:									
Shinrock, till substratum	Dense material	60- 80	---	---	---	---	High	High	Moderate.
Glynwood	Dense material	25- 50	---	---	---	---	High	High	Moderate.

TABLE 32.--SOIL FEATURES--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
SmA:									
Shoals	---	> 80	---	---	---	---	High	High	Low.
SnA:									
Sloan	---	> 80	---	---	---	---	High	High	Low.
SoA:									
Sloan	---	> 80	---	---	---	---	High	High	Low.
SpA:									
Sloan, limestone substratum	Bedrock (lithic)	60- 80	---	---	---	---	High	High	Low.
StB2:									
St. Clair	Dense material	20- 55	---	---	---	---	Moderate	High	Moderate.
StC2:									
St. Clair	Dense material	20- 55	---	---	---	---	Moderate	High	Moderate.
ThA:									
Thackery, till substratum	Dense material	60- 80	---	---	---	---	High	Moderate	Moderate.
TkA:									
Tiderishi	---	> 80	---	---	---	---	High	High	Moderate.
TnA:									
Toledo	---	> 80	---	---	---	---	High	High	Low.
ToB:									
Tuscola	---	> 80	---	---	---	---	High	Moderate	Moderate.
TpA:									
Tuscola	---	> 80	---	---	---	---	High	Moderate	Moderate.
TpB:									
Tuscola	---	> 80	---	---	---	---	High	Moderate	Moderate.
TuB:									
Tuscola	---	> 80	---	---	---	---	High	Moderate	Moderate.
UcA:									
Udorthents	---	---	---	---		---	---	---	---
UcD:									
Udorthents	---	---	---	---		---	---	---	---
Ur:									
Urban land	---	---	---	---		---	---	---	---
VaA:									
Vanlue	---	> 80	---	---	---	---	High	High	Moderate.
VeA:									
Vaughnsville	Dense material	40- 60	---	---	---	---	Moderate	Moderate	Low.
W:									
Water	---	---	---	---		---	---	---	---
WeA:									
Westland	---	> 80	---	---	---	---	High	High	Low.
Rensselaer	---	> 80	---	---	---	---	High	High	Low.

TABLE 33.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
Alvada	Fine-loamy, mixed, mesic Typic Argiaquolls
Aquents	Mixed, mesic Aquents
Arkport	Coarse-loamy, mixed, active, mesic Lamellic Hapludalfs
Aurand	Fine-loamy, mixed, mesic Aquic Argiudolls
Biglick	Clayey, illitic, mesic Lithic Hapludalfs
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Channahon	Loamy, mixed, mesic Lithic Argiudolls
Colwood	Fine-loamy, mixed, mesic Typic Endoaquolls
Cygnet	Fine-loamy, mixed, mesic Aquic Hapludalfs
Darroch	Fine-loamy, mixed, mesic Aquic Argiudolls
Del Rey	Fine, illitic, mesic Aeric Epiaqualfs
Dunbridge	Fine-loamy, mixed, mesic Mollic Hapludalfs
Elliott	Fine, illitic, mesic Aquic Argiudolls
Flatrock	Fine-loamy, mixed, mesic Fluvaquentic Eutrochrepts
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
Fulton	Fine, illitic, mesic Aeric Epiaqualfs
Gallman	Fine-loamy, mixed, mesic Typic Hapludalfs
Gilford	Coarse-loamy, mixed, mesic Typic Endoaquolls
Glynwood	Fine, illitic, mesic Aquic Hapludalfs
Harrod	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Haskins	Fine-loamy, mixed, mesic Aeric Epiaqualfs
Houcktown	Fine-loamy, mixed, mesic Aquic Hapludalfs
Hoytville	Fine, illitic, mesic Mollic Epiaqualfs
Jenera	Fine-loamy, mixed, mesic Aquic Hapludalfs
*Joliet	Loamy, mixed, mesic Lithic Endoaquolls
Knoxdale	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Lamberjack	Fine-loamy, mixed, mesic Aeric Epiaqualfs
Lucas	Fine, illitic, mesic Oxyaquic Hapludalfs
Lybrand	Fine, illitic, mesic Typic Hapludalfs
Medway	Fine-loamy, mixed, mesic Fluvaquentic Hapludolls
Mermill	Fine-loamy, mixed, mesic Mollic Epiaqualfs
Millsdale	Fine, mixed, mesic Typic Argiaquolls
Milton	Fine, mixed, mesic Typic Hapludalfs
Morley	Fine, illitic, mesic Oxyaquic Hapludalfs
Mortimer	Fine, illitic, mesic Aquic Hapludalfs
Nappanee	Fine, illitic, mesic Aeric Epiaqualfs
Oshtemo	Coarse-loamy, mixed, mesic Typic Hapludalfs
Ottokee	Mixed, mesic Aquic Udipsamments
Patton	Fine-silty, mixed, mesic Typic Endoaquolls
Pewamo	Fine, mixed, mesic Typic Argiaquolls
Randolph	Fine, mixed, mesic Aeric Endoaqualfs
Rawson	Fine-loamy, mixed, mesic Oxyaquic Hapludalfs
Rensselaer	Fine-loamy, mixed, mesic Typic Argiaquolls
Rimer	Loamy, mixed, mesic Aquic Arenic Hapludalfs
Rossburg	Fine-loamy, mixed, mesic Fluventic Hapludolls
Shawtown	Fine-loamy, mixed, mesic Oxyaquic Hapludalfs
Shinrock	Fine, illitic, mesic Aquic Hapludalfs
Shoals	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Sloan	Fine-loamy, mixed, mesic Fluvaquentic Endoaquolls
St. Clair	Fine, illitic, mesic Oxyaquic Hapludalfs
Thackery	Fine-loamy, mixed, mesic Aquic Hapludalfs
Tiderishi	Fine-loamy, mixed, mesic Aquic Argiudolls
Toledo	Fine, illitic, nonacid, mesic Mollic Endoaquepts
Tuscola	Fine-loamy, mixed, mesic Aquic Hapludalfs
Udorthents	Mixed, mesic Udorthents
Vanlue	Fine-loamy, mixed, mesic Aquic Hapludalfs
Vaughnsville	Fine-loamy, mixed, mesic Oxyaquic Hapludalfs
Westland	Fine-loamy, mixed, mesic Typic Argiaquolls

TABLE 34.--INTERPRETIVE GROUPS

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
AdA:	4w		Not prime farmland	
Adrian		D-1		Yes
AkA:	2w		Prime farmland if drained	
Alvada		C-1		Yes
AmA:	---		Not prime farmland	
Alvada		---		Yes
Urban land		---		Unranked
AnA:	---		Not prime farmland	
Aquents		---		Yes
ApB:	2e		All areas are prime farmland	
Arkport		B-1		No
ArA:	2w		Prime farmland if drained	
Aurand		C-1		No
AsA:	---		Not prime farmland	
Aurand		---		No
Urban land		---		Unranked
BgA:	3s		Not prime farmland	
Biglick		E-1		No
Milton		F-1		No
BgB:	3e		Not prime farmland	
Biglick		E-1		No
Milton		F-1		No
BnA:	2w		Prime farmland if drained	
Blount		C-1		No
BoA:	2w		Prime farmland if drained	
Blount		C-1		No
BoB:	2e		Prime farmland if drained	
Blount		C-1		No
BpA:	2w		Prime farmland if drained	
Blount		C-1		No
Houcktown		A-6		No
BrA:	2w		Prime farmland if drained	
Blount		C-1		No
Jenera		A-6		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
BuA:	---		Not prime farmland	
Blount		---		No
Urban land		---		Unranked
ChC:	4e		Not prime farmland	
Channahon		E-1		No
Biglick		E-1		No
CoA:	2w		Prime farmland if drained	
Colwood		C-1		Yes
CtA:	1		All areas are prime farmland	
Cygnet		A-6		No
CuA:	---		Not prime farmland	
Cygnet		---		No
Urban land		---		Unranked
DbA:	2w		Prime farmland if drained	
Darroch		C-1		No
DeA:	2w		Prime farmland if drained	
Del Rey		C-1		No
DfA:	2w		Prime farmland if drained	
Del Rey		C-1		No
Blount		C-1		No
DuB:	3s		All areas are prime farmland	
Dunbridge		F-1		No
EmA:	2w		Prime farmland if drained	
Elliott		C-1		No
FbA:	2w		All areas are prime farmland	
Flatrock		A-5		No
FcA:	2w		All areas are prime farmland	
Flatrock		A-5		No
FdA:	2w		All areas are prime farmland	
Flatrock, limestone substratum		A-5		No
FoA:	2s		All areas are prime farmland	
Fox		A-1		No
FoB:	2e		All areas are prime farmland	
Fox		A-1		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
FoC2:	3e		Not prime farmland	
Fox		A-1		No
FsA:	3w		Prime farmland if drained	
Fulton		C-2		No
FtA:	3w		Prime farmland if drained	
Fulton, till substratum		C-2		No
GaB:	2e		All areas are prime farmland	
Gallman		A-1		No
GfA:	3w		Prime farmland if drained	
Gilford		C-1		Yes
GmA:	1		All areas are prime farmland	
Glynwood, limestone substratum		A-6		No
GnB:	2e		All areas are prime farmland	
Glynwood		A-6		No
GpB2:	3e		All areas are prime farmland	
Glynwood		A-6		No
GpC2:	4e		Not prime farmland	
Glynwood		A-6		No
GsB:	2e		All areas are prime farmland	
Glynwood		A-6		No
Blount		C-1		No
Houcktown		A-6		No
GuB:	---		Not prime farmland	
Glynwood		---		No
Urban land		---		Unranked
HaA:	3w		Prime farmland if protected from flooding or not frequently flooded during the growing season	
Harrod		F-1		No
HkA:	2w		Prime farmland if drained	
Haskins		C-1		No
HnA:	2w		Prime farmland if drained	
Haskins		C-1		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
HpA:	1		All areas are prime farmland	
Houcktown		A-6		No
HpB:	2e		All areas are prime farmland	
Houcktown		A-6		No
HrB:	2e		All areas are prime farmland	
Houcktown		A-6		No
Glynwood		A-6		No
Jenera		A-6		No
HsA:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
HtA:	2w		Prime farmland if drained	
Hoytville		C-1		Yes
JeA:	1		All areas are prime farmland	
Jenera		A-6		No
JeB:	2e		All areas are prime farmland	
Jenera		A-6		No
JfB:	2e		All areas are prime farmland	
Jenera		A-6		No
Shinrock, till substratum		A-6		No
JoA:	4w		Not prime farmland	
Joliet		E-1		Yes
KnA:	2w		All areas are prime farmland	
Knoxdale		A-5		No
LbA:	2w		Prime farmland if drained	
Lamberjack		C-1		No
LcA:	---		Not prime farmland	
Lamberjack		---		No
Urban land		---		Unranked
LuB2:	3e		All areas are prime farmland	
Lucas		A-1		No
LyE:	6e		Not prime farmland	
Lybrand		A-3		No
MbA:	2w		All areas are prime farmland	
Medway		A-5		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
McA:	2w		All areas are prime farmland	
Medway, limestone substratum		A-5		No
MeA:	2w		Prime farmland if drained	
Mermill		C-1		Yes
MfA:	2w		Prime farmland if drained	
Mermill		C-1		Yes
MgA:	3w		Prime farmland if drained	
Millsdale		C-2		Yes
MnA:	2s		All areas are prime farmland	
Milton		F-1		No
MpD3:	6e		Not prime farmland	
Morley		A-1		No
MrA:	1		All areas are prime farmland	
Morley, limestone substratum		A-1		No
MsB:	2e		All areas are prime farmland	
Morley, limestone substratum		A-1		No
Milton		F-1		No
MvB:	3e		All areas are prime farmland	
Mortimer		F-5		No
MwB2:	4e		All areas are prime farmland	
Mortimer		F-5		No
NnA:	3w		Prime farmland if drained	
Nappanee		F-7		No
NnB:	3e		Prime farmland if drained	
Nappanee		F-7		No
NpA:	3w		Prime farmland if drained	
Nappanee		F-7		No
NpB2:	3e		Prime farmland if drained	
Nappanee		F-7		No
NrA:	---		Not prime farmland	
Nappanee		---		No
Urban land		---		Unranked
OrA:	3s		All areas are prime farmland	
Oshtemo		A-1		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
OrB:	3e		All areas are prime farmland	
Oshtemo		A-1		No
OrC:	3e		Not prime farmland	
Oshtemo		A-1		No
OsB:	3e		All areas are prime farmland	
Oshtemo, till substratum		A-1		No
OwB:	3s		Not prime farmland	
Ottokee		B-1		No
PbA:	2w		Prime farmland if drained	
Patton		C-1		Yes
PmA:	2w		Prime farmland if drained	
Pewamo		C-1		Yes
PnA:	---		Not prime farmland	
Pewamo		---		Yes
Urban land		---		Unranked
Pt:	---		Not prime farmland	
Pits		---		Unranked
RcA:	3w		Prime farmland if drained	
Randolph		C-2		No
RgB:	2e		All areas are prime farmland	
Rawson		A-1		No
RhA:	2w		Prime farmland if drained	
Rensselaer, till substratum		C-1		Yes
RnA:	2w		Not prime farmland	
Rimer		C-1		No
RoA:	2w		Prime farmland if drained	
Rimer, deep phase		C-1		No
RtA:	2w		All areas are prime farmland	
Rossburg		A-5		No
SeA:	1		All areas are prime farmland	
Shawtown		A-1		No
SeB:	2e		All areas are prime farmland	
Shawtown		A-1		No
SfB:	2e		All areas are prime farmland	
Shinrock		A-6		No

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
SgC2:	3e		Not prime farmland	
Shinrock		A-6		No
SkB:	2e		All areas are prime farmland	
Shinrock, till substratum		A-6		No
Glynwood		A-6		No
SmA:	2w		Prime farmland if drained	
Shoals		C-3		No
SnA:	3w		Prime farmland if drained	
Sloan		C-3		Yes
SoA:	3w		Prime farmland if drained	
Sloan		C-3		Yes
SpA:	3w		Prime farmland if drained	
Sloan, limestone substratum		C-3		Yes
StB2:	3e		All areas are prime farmland	
St. Clair		F-5		No
StC2:	4e		Not prime farmland	
St. Clair		F-5		No
ThA:	1		All areas are prime farmland	
Thackery, till substratum		A-1		No
TkA:	2w		Prime farmland if drained	
Tiderishi		C-1		No
TnA:	3w		Prime farmland if drained	
Toledo		C-2		Yes
ToB:	2e		All areas are prime farmland	
Tuscola		A-6		No
TpA:	1		All areas are prime farmland	
Tuscola		A-6		No
TpB:	2e		All areas are prime farmland	
Tuscola		A-6		No
TuB:	2e		All areas are prime farmland	
Tuscola		A-6		No
UcA:	---		Not prime farmland	
Udorthents		---		Unranked
UcD:	---		Not prime farmland	
Udorthents		---		Unranked

TABLE 34.--INTERPRETIVE GROUPS--Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
Ur:	---		Not prime farmland	
Urban land		---		Unranked
VaA:	2w		Prime farmland if drained	
Vanlue		C-1		No
VeA:	1		All areas are prime farmland	
Vaughnsville		A-1		No
WeA:	2w		Prime farmland if drained	
Westland		C-1		Yes
Rensselaer		C-1		Yes