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Conservation
Service

In cooperation with
Michigan Department of
Natural Resources,
Michigan Department of
Agriculture, and Michigan
State University-Extension

Soil Survey of Luce County, Michigan



How To Use This Soil Survey

General Soil Map

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

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

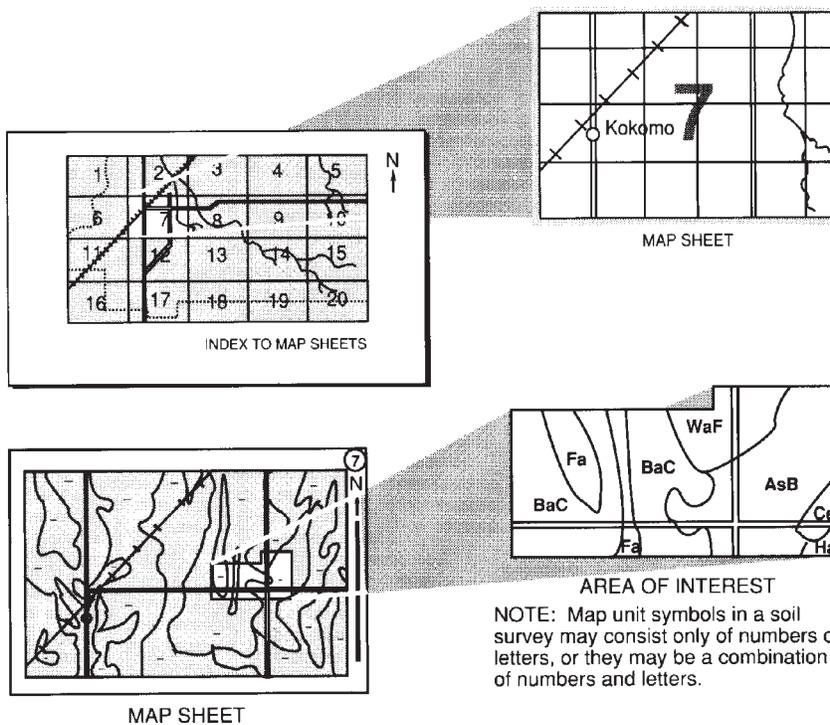
Detailed Soil Maps

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

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

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

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



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

Major fieldwork for this soil survey was completed in 2001. Soil names and descriptions were approved in 2003. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2003. This survey was made cooperatively by the Natural Resources Conservation Service, the Michigan Department of Agriculture, Michigan Technological University, and Michigan State University-Extension. The survey is part of the technical assistance furnished to the Luce-West Mackinac Conservation District and other agencies within the county. Financial assistance was provided by Luce County.

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

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Cover: A view of Tahquamenon Falls. The Tahquamenon River cut through the Munising sandstone formation to create the falls. The river was used for log drives during the logging era. It is now a State park that is visited by thousands of people each year.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.

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Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, foresters, and agronomists can use the surveys to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the surveys 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 surveys 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 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, and information on specific uses is given. 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.

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Soil Survey of Luce County, Michigan

By Gregory Whitney and Stephen Rodock, Natural Resources
Conservation Service

Fieldwork by Stephen Rodock, Paula Berenkowski, and Gregory Whitney

United States Department of Agriculture, Natural Resources Conservation
Service, in cooperation with the Michigan Department of Natural
Resources, the Michigan Department of Agriculture, Michigan
Technological University, Michigan State University-Extension, and the
Luce County Board of Commissioners

LUCE COUNTY is in the eastern part of the Upper Peninsula of Michigan (fig. 1). It has an area of 593,319 acres, or about 935 square miles. It has about 30 miles of Lake Superior shoreline and many miles of rivers and streams. The Great Lakes Shoreline, the rivers and streams, the Tahquamenon Falls, and the thousands of acres of forests make the area a popular destination for tourists in summer and winter. Tourism, the schools, the hospital, and the prison are the main employers in the county. The population of the county was about 7,000 in 1990. The county seat is Newberry.

About 95 percent of the county, or about 550,000 acres, is forested. The remaining acreage is agricultural land, urban land, or recreational areas. There are 62 different kinds of soil in the county. The soils vary widely in texture, natural drainage, slope, and other characteristics. Many of the soils are best suited to forestland because of steep slopes, droughtiness, or wetness. Large areas of dry, acid sands in the county are excellent for blueberries, and there are also some large acid bogs that are excellent for cranberries.

This survey updates the soil survey of Luce County published in 1929 (Veatch and others, 1929). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the Survey Area

This section provides general information about Luce County. It describes climate, history and development, physiography, and lakes and streams.

Climate

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



Figure 1.—Location of Luce County in Michigan.

In winter, the average temperature is 17.3 degrees F and the average daily minimum temperature is 9.4 degrees. The lowest temperature on record, which occurred at Newberry on January 26, 1927, is -30 degrees. In summer, the average temperature is 62.2 degrees and the average daily maximum temperature is 73.7 degrees. The highest recorded temperature, which occurred at Newberry on July 13, 1936, is 103 degrees.

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

The average annual total precipitation is 32.36 inches. Of this total, 13.21 inches, or about 41 percent, usually falls in June through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.18 inches on July 22, 1994. Thunderstorms occur on about 29 days each year, and most occur between June and September.

The average seasonal snowfall is 112.6 inches. The greatest snow depth at any one time during the period of record was 49 inches, recorded on January 27, 1994. On an average, about 117 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 23.0 inches, recorded on January 4, 1982.

The average relative humidity in midafternoon is about 55 percent in May and nearly 75 percent in December. Humidity is higher at night, and the average at dawn is about 80 percent in most months and is nearly 90 percent from June to September. The sun shines about 60 percent of the time possible in summer and 34 percent in winter. The prevailing wind is from the northwest for most of the year, but it is from the

south during much of the summer. Average windspeed is highest, around 10 miles per hour, during March and April.

History and Development

Luce County, founded in 1887, was named for Cyrus B. Luce, who was the governor of Michigan at the time (Taylor and Sprague, 1991). Area history did not begin with the founding of the county, however. Many people played a part in the historical land use of the area. The earliest known inhabitants were the Canoe Indians of the North, of the tribe called the Ojibway, today known as the Chippewa. Jesuits found them in the area in 1650 (Luce County Historical Society, 1995).

During the summer of 1840, William A. Burt led the first chain-and-compass surveying team in the area in order to set some precise land identification. This survey was the start of the great lumber boom that affected all of the area. Beginning in the 1870s, great numbers of foreign and local timbermen invested in the forestland. The major lumbering era ran from the 1870s through the early 1900s. At first, logs were transported via the river system; therefore, timber cuts were limited to those areas near the river system. The development of railroads, logging roads, mills, farms, and settlements improved the efficiency of timber harvesting and filled the needs of lumber interests as well as providing timber for the Vulcan Furnace Company, which was located in Newberry. At the Vulcan plant, hardwood timber was used in the manufacturing of charcoal for the production of pig iron. The iron was sent by ship to the Detroit area for the production of steel.

Besides forestry practices, agriculture also had a role in the county's land use history. Mainly as a result of the soil types and drainage characteristics, agriculture has been limited to the area south of the Tahquamenon River, especially in the Manistique Lakes region. There were many schemes to drain thousands of acres of Tahquamenon lowland for agriculture, but none was successful. One such attempt in 1882 was only partially successful. In order to improve drainage upstream and aid with log driving, a part of the rock-bed in the rapids near the Upper Falls of the Tahquamenon River was blasted out with dynamite. In the early 1900s, the railroad company cleared land near Newberry for the production of celery. Newberry, then known as "Celery City," was the agricultural center for celery, its prosperity peaking in about 1920.

Other important developments in the county were the building of a State mental hospital in 1895 just south of Newberry. When this facility closed in 1992, the local economy was devastated. A State correctional facility was established at the State mental hospital site in 1995.

Physiography

The physiography in Luce County (fig. 2) ranges from steep, pitted disintegration moraines to gently sloping lake plains to nearly level outwash plains. Elevation ranges from about 1,190 feet above sea level on the Munising moraine to about 602 feet at the Lake Superior shoreline.

The bedrock geology of Luce County consists of seven major stratigraphic units: Burnt Bluff limestone, Cataract dolomite, Richmond limestone and dolomite, Collingwood shale, the Black River Group, Munising sandstone and the Hermansville Formation, and Jacobsville sandstone (Vanlier, 1959). Outcroppings of the Burnt Bluff limestone occur on the Mackinac County line just north of the Hendricks Quarry (T. 45 N., R. 9 W.). Cataract dolomite outcrops near Manistique Lake (T. 45 N., R. 12 W.) and just north of Michigan Highway 28 west of Soo Junction (T. 45 N., R. 8 W.). Munising sandstone is very near the surface north of Pine Stump Junction (T. 48 N., R. 10 W.) and is exposed at the Falls of the Tahquamenon River and along the Two

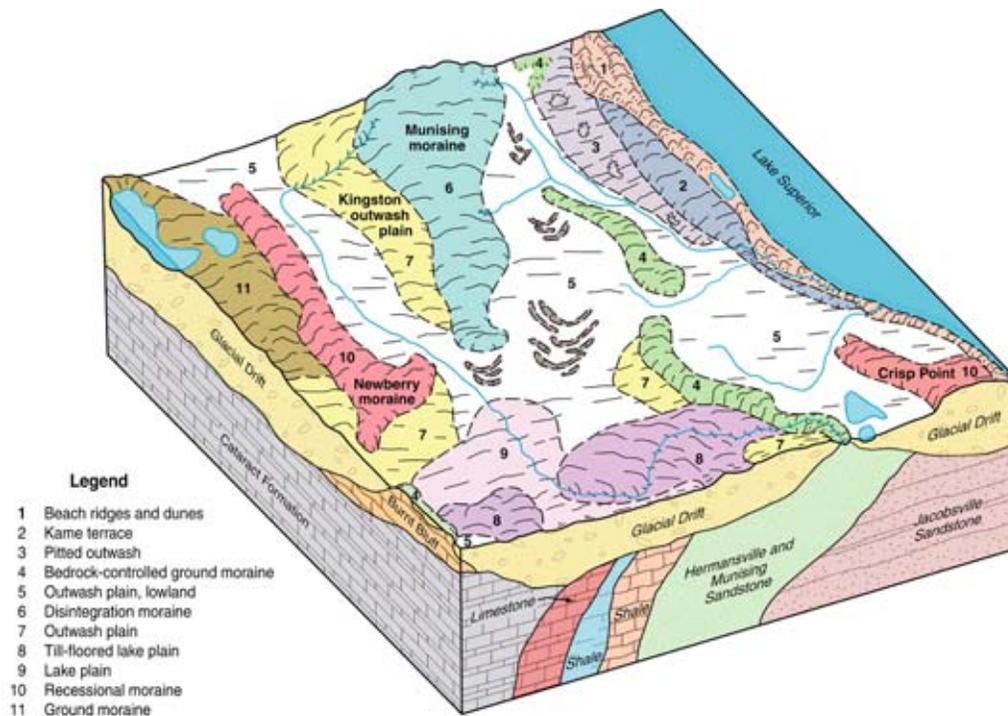


Figure 2.—Physiography of Luce County.

Hearted River for more than a mile upstream from the High Bridge on County Road 407 (Vanlier, 1959).

Luce County was glaciated many times during the Pleistocene Epoch, but almost all traces had been removed by the Superior Lobe re-advance of the Wisconsin Ice Sheet. The present topography of Luce County is a result of glacial deposits, erosion, and glacial lake processes (Smith, 1936). Most of Luce County (at an elevation of less than 890 feet) was heavily influenced by wave action during the lowering of the glacial lake levels, then by wind activity shortly after the lakes receded. The Superior Lobe left its mark on Luce County with two strongly developed moraine systems—Newberry and Munising—and one weakly developed moraine system—Crisp Point. These systems were probably continuous for some time after the ice retreated and no doubt served as barriers, at least temporarily, against rapid outflow and were responsible for much of the ponding water that occurred during the existence of early Glacial Lake Algonquin (Smith, 1936).

The Newberry moraine in the southern part of the county (unit 10) represents the maximum extension of the Superior Lobe in Luce County (Smith, 1936). Areas of this moraine below an elevation of 890 feet have been greatly modified by the waters of Lake Algonquin. The Newberry moraine is characterized by coarse textured tills that contain more limestone and dolomite fragments than areas to the north. These soils are more alkaline than the soils to the north.

The Munising moraine (unit 6) is marked by chaotic kettles and steep relief, especially on the west side of Luce County. As the ice stood upon the Munising moraine, it blocked the present outlet of the Tahquamenon River, resulting in the meltwaters being carried southward and eventually breaking through the Newberry moraine to the Lake Michigan basin (Smith, 1936). The soils of the Munising moraine are sandy and more acid than the soils on the Newberry moraine.

The Crisp Point moraine in the northern part of the county (unit 10) marks the final position of the Superior Lobe and the Wisconsin Ice Sheet as a whole in Michigan. This moraine is the youngest glacial feature in Michigan (Smith, 1936). The Crisp Point moraine is weakly expressed, which may indicate that the ice did not hold its position for very long before melting. Also, since most of this moraine is below an elevation of 890 feet, it was water worked and modified by Lake Algonquin waters. The soils of this moraine are silty to sandy and are very acid.

The ground moraine area in the southwest corner of Luce County (unit 11) is glacial drift deposited by the Michigan Lobe of the Wisconsin Ice Sheet. The drift was further affected by the meltwaters of the Superior Lobe re-advance. This ground moraine is characterized by soils with complex textures of sand, silt, and clay. The rock fragments are mostly limestone and dolomite. The tills are alkaline in nature.

The bedrock-controlled ground moraines (unit 4) in the southeastern part of Luce County are underlain by Burnt Bluff limestone and Cataract dolomite. The soils in this area are loamy and alkaline. The bedrock-controlled ground moraines in the northern part of Luce County are underlain by Munising sandstone. The soils are sandy to loamy and are acid.

The areas of till-floored lake plains (unit 8) are old ground moraines covered by lacustrine deposits from Glacial Lake Algonquin. The lacustrine deposits are silts, clays, and sands that cover the loamy alkaline tills.

More than one-half of Luce County is covered by some type of outwash deposit. Many of the outwash areas are below an elevation of 890 feet and have been modified by Lake Algonquin waters. Some are mostly well drained, sandy soils (units 3 and 7). In the northern part of the county (unit 3) is pitted outwash that formed from detached ice blocks from the nearby moraine. The central part of the county is a large outwash plain (unit 5) that is mostly wet soils with sand dunes and ridges. The three major drainage systems in this landform are the Tahquamenon River, the Two Hearted River, and the Fox River. The low areas are now organic deposits over the sandy outwash.

The lake plain (unit 9) on the east side of Luce County consists of lacustrine deposits of clays and silts.

The kame terrace (unit 2) in the northern part of the county was deposited by meltwater streams flowing along the Superior Lobe of ice as it was melting. The soils on the kame terrace are stratified sandy deposits and are acid.

The beach ridges and dunes (unit 1) are below the Lake Nipissing High Stage (an elevation of about 650 feet). These beach ridges and dunes have formed over the last 2,500 years.

Lakes and Streams

The county has more than 14,000 acres of lakes and ponds. These bodies of water range in size from 5 acres (Bullhead Lake) to 7,000 acres (Manistique Lake). Other lakes in the county are North Manistique Lake, 1,700 acres; Betsy Lake, 1,300 acres; Muskallonge Lake, 780 acres; and Pike Lake, 290 acres.

There are two large river systems in Luce County. One is the Tahquamenon River, which covers more than 50 miles. The other is the Two Hearted River and its many branches. The Tahquamenon River starts in the northwestern part of the county, swings southeast through the center of the county, and exits in the northeast. The Two Hearted River starts in the northwestern part of the county and then flows northwesterly to Lake Superior. There are more than 60 other rivers and creeks in the county. The drainage for the northern two-thirds of the county is to Lake Superior. Water in the southern one-third drains into Lake Michigan. Most of the creeks and rivers have sand bottoms, but a few are loamy or mucky. Sandstone bedrock is exposed in the river bottom of the Two Hearted and Tahquamenon Rivers.

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.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of an improved knowledge of soils, modifications in series concepts, and the changing concepts of soil mapping and soil descriptions.

Survey Procedures

The general procedures followed in making this survey are described in the "National Soil Survey Handbook" of the Natural Resources Conservation Service (USDA/NRCS).

A reconnaissance was made by pickup truck before the soil scientists traversed the surface on foot. In areas where the soil pattern is very complex, traverses and random observations were spaced as closely as 200 yards. In areas where the soil pattern is relatively simple, traverses were about one-fourth mile apart.

As they traversed the surface, the soil scientists divided the landscape into segments. For example, a hillside was separated from a swale and a gently sloping ridgetop from a very steep side slope.

Observations of such items as landforms, blown-down trees, vegetation, and roadbanks were made without regard to spacing. Soil boundaries were determined on the basis of soil examinations, observations of the landscape and vegetation, and photo interpretation. The soil material was examined with the aid of a hand auger or a spade to a depth of about 7 feet. The pedons described as typical were observed and studied in pits that were dug with shovels, mattocks, and digging bars.

Notes were taken on the composition of map units during the first years of the project. These notes were supplemented with additional notes as mapping progressed and as the composition of individual map units was determined.

Samples for chemical and physical analyses were taken from representative sites of some soils in the survey area (USDA/NRCS, 2004). The analyses were made by the National Soil Survey Laboratory, Lincoln, Nebraska. The results of the studies can be obtained on request from the laboratory or from the State office of the Natural Resources Conservation Service in East Lansing, Michigan.

After the completion of soil mapping on aerial photographs, map unit delineations were transferred by hand to another set of the same photographs. Cultural features were recorded from observations of the maps and the landscape.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. These broad areas are called associations. Each association 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 association 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 association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soils on Outwash Plains

1. Deer Park Association

Very deep, level to very steep, excessively drained, sandy soils

Setting

Landform: Beach ridges and dunes

Slope range: 0 to 60 percent

Composition

Extent of the association: 4 percent of the survey area

Extent of the soils in the association:

Deer Park and similar soils—85 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Deer Park

Depth class: Very deep

Drainage class: Excessively drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Soils of Minor Extent

- Croswell soils in the slightly lower landscape positions
- Dawson and Tawas soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations and seedling mortality

Management considerations:

- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

2. Rubicon-Dawson Association

Very deep, level to very steep, excessively drained, sandy soils and very poorly drained, organic soils

Setting

Landform: Outwash plains and pitted outwash plains

Slope range: 0 to 60 percent

Composition

Extent of the association: 13 percent of the survey area

Extent of the soils in the association:

Rubicon and similar soils—65 percent

Dawson and similar soils—20 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Rubicon

Depth class: Very deep

Drainage class: Excessively drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Dawson

Depth class: Very deep

Drainage class: Very poorly drained

Parent material: Peat deposits over sand

Texture of the surface layer: Peat

Slope class: Level

Soils of Minor Extent

- Wallace and Kalkaska soils in landscape positions similar to those of the Rubicon soils
- Spot soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and seedling mortality

Management considerations:

- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

3. Dawson-Rousseau Association

Very deep, level to very steep, very poorly drained, organic soils and excessively drained, sandy soils

Setting

Landform: Outwash plains
Slope range: 0 to 60 percent

Composition

Extent of the association: 32 percent of the survey area
Extent of the soils in the association:
Dawson and similar soils—70 percent
Rousseau and similar soils—15 percent
Soils of minor extent—15 percent

Soil Properties and Qualities

Dawson

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Peat deposits over sand
Texture of the surface layer: Peat
Slope class: Level

Rousseau

Depth class: Very deep
Drainage class: Excessively drained
Parent material: Sand
Texture of the surface layer: Fine sand
Slope class: Level to very steep

Soils of Minor Extent

- Finch soils in landscape positions slightly lower than those of the Rousseau soils
- Kinross soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and seedling mortality

Management considerations:

- Opportunities for logging are limited because the soils support very few trees. Low strength also limits logging activities.
- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

4. Kalkaska-Wallace-Paquin Association

Very deep, level to very steep, somewhat excessively drained to well drained, sandy soils

Setting

Landform: Outwash plains
Slope range: 0 to 60 percent

Composition

Extent of the association: 8 percent of the survey area

Extent of the soils in the association:

Kalkaska and similar soils—45 percent

Wallace and similar soils—25 percent

Paquin and similar soils—15 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Kalkaska

Depth class: Very deep

Drainage class: Somewhat excessively drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Wallace

Depth class: Very deep

Drainage class: Well drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Paquin

Depth class: Very deep

Drainage class: Moderately well drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level and nearly level

Soils of Minor Extent

- Dawson and Lupton soils in depressions
- Finch soils in landscape positions slightly lower than those of the Wallace soils
- Spot soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and seedling mortality

Management considerations:

- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

5. Pence Association

Very deep, level to steep, somewhat excessively drained, sandy soils

Setting

Landform: Outwash terraces

Slope range: 0 to 35 percent

Composition

Extent of the association: 1 percent of the survey area

Extent of the soils in the association:

Pence and similar soils—90 percent

Soils of minor extent—10 percent

Soil Properties and Qualities

Pence

Depth class: Very deep

Drainage class: Somewhat excessively drained

Parent material: Sand

Texture of the surface layer: Loamy sand

Soils of Minor Extent

- Carbondale soils in depressions
- Finch soils in the lower landscape positions
- Auger soils in the slightly lower landscape positions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and plant competition

Management considerations:

- Building roads on the contour can help to control erosion.
- Site preparation by mechanical or chemical means helps to control plant competition.

6. Kalkaska Association

Very deep, level to very steep, somewhat excessively drained, sandy soils

Setting

Landform: Outwash

Slope range: 0 to 60 percent

Composition

Extent of the association: 1 percent of the survey area

Extent of the soils in the association:

Kalkaska and similar soils—85 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Kalkaska

Depth class: Very deep

Drainage class: Somewhat excessively drained

Parent material: Sand

Texture of the surface layer: Sand

Soils of Minor Extent

- Finch soils in the slightly lower landscape positions
- Carbondale, Greenwood, and Kinross soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations and seedling mortality

Management considerations:

- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

Soils on Ground Moraines and Bedrock-Controlled Ground Moraines

7. Wallace-Bodi-Paquin Association

Very deep, level to very steep, well drained and moderately well drained, sandy soils and moderately well drained, loamy soils

Setting

Landform: Bedrock-controlled ground moraines

Slope range: 0 to 60 percent

Composition

Extent of the association: 4 percent of the survey area

Extent of the soils in the association:

Wallace and similar soils—60 percent

Bodi and similar soils—15 percent

Paquin and similar soils—15 percent

Soils of minor extent—10 percent

Soil Properties and Qualities

Wallace

Depth class: Very deep

Drainage class: Well drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Bodi

Depth class: Very deep

Drainage class: Moderately well drained

Parent material: Loamy glacial till

Texture of the surface layer: Silt loam

Slope class: Level and nearly level

Paquin

Depth class: Very deep

Drainage class: Moderately well drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level and nearly level

Soils of Minor Extent

- Deerton soils in landscape positions similar to those of the Paquin soils

- Dawson soils in depressions
- Finch soils in the slightly lower landscape positions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and seedling mortality

Management considerations:

- The seasonal high water table in areas of the Bodi soils restricts the use of equipment to summer or winter.
- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

8. Trenary-McMillan Association

Very deep, level to steep, well drained, sandy and loamy soils

Setting

Landform: Ground moraines

Slope range: 0 to 35 percent

Composition

Extent of the association: 4 percent of the survey area

Extent of the soils in the association:

Trenary and similar soils—40 percent

McMillan and similar soils—35 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Trenary

Depth class: Very deep

Drainage class: Well drained

Parent material: Loamy glacial till

Texture of the surface layer: Fine sandy loam

Slope class: Nearly level to steep

McMillan

Depth class: Very deep

Drainage class: Well drained

Parent material: Loamy and sandy glaciofluvial sediments

Texture of the surface layer: Fine sandy loam

Slope class: Level to steep

Soils of Minor Extent

- Lupton soils in depressions
- Solona soils in the lower landscape positions
- Graveraet soils in the slightly lower landscape positions
- Kalkaska and Menominee soils in landscape positions similar to those of the Trenary and McMillan soils

Use and Management

Land use: Woodland

Major management concerns: Erosion hazard and plant competition

Management considerations:

- Building roads on the contour can help to control erosion.
- Site preparation by mechanical or chemical means helps to control plant competition.

9. Amadon-Longrie Association

Shallow and moderately deep, level to steep, well drained, loamy soils

Setting

Landform: Bedrock-controlled ground moraines

Slope range: 0 to 45 percent

Composition

Extent of the association: 1 percent of the survey area

Extent of the soils in the association:

Amadon and similar soils—40 percent

Longrie and similar soils—35 percent

Components of minor extent—25 percent

Soil Properties and Qualities

Amadon

Depth class: Shallow

Drainage class: Well drained

Parent material: Loamy glacial till

Texture of the surface layer: Sandy loam

Slope class: Level to steep

Longrie

Depth class: Moderately deep

Drainage class: Well drained

Parent material: Loamy glacial till

Texture of the surface layer: Sandy loam

Slope class: Level to steep

Components of Minor Extent

- Areas of rock outcrop
- Kalkaska and Menominee soils in landscape positions similar to those of the Amadon and Longrie soils
- Lupton soils in depressions
- Alcona soils in the slightly lower landscape positions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, windthrow hazard, and plant competition

Management considerations:

- Rock outcrops and areas where bedrock is close to the surface should be considered when road locations and landing sites are planned.
- Building roads on the contour can help to control erosion.

- Site preparation by mechanical or chemical means helps to control plant competition.
- Harvest methods that reduce the windthrow hazard should be used.

Soils on Disintegration Moraines

10. Kalkaska-Dillingham Association

Very deep, level to very steep, somewhat excessively drained and well drained, sandy soils

Setting

Landform: Disintegration moraines
Slope range: 0 to 70 percent

Composition

Extent of the association: 10 percent of the survey area
Extent of the soils in the association:
Kalkaska and similar soils—50 percent
Dillingham and similar soils—25 percent
Soils of minor extent—25 percent

Soil Properties and Qualities

Kalkaska

Depth class: Very deep
Drainage class: Somewhat excessively drained
Parent material: Sand
Texture of the surface layer: Sand
Slope class: Level to very steep

Dillingham

Depth class: Very deep
Drainage class: Well drained
Parent material: Sand
Texture of the surface layer: Sand
Slope class: Level to very steep

Soils of Minor Extent

- Dawson, Deford, and Carbondale soils in depressions
- Okeefe, Paquin, and Wallace soils in landscape positions slightly lower than those of the Kalkaska soils

Use and Management

Land use: Woodland
Major management concerns: Equipment limitations, erosion hazard, and seedling mortality
Management considerations:

- Loose sand can interfere with the traction of logging equipment.
- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

Soils on Recessional Moraines

11. Kalkaska-McMillan-Kaks Association

Very deep, level to very steep, somewhat excessively drained and well drained, sandy and loamy soils

Setting

Landform: Recessional moraines

Slope range: 0 to 60 percent

Composition

Extent of the association: 5 percent of the survey area

Extent of the soils in the association:

Kalkaska and similar soils—40 percent

McMillan and similar soils—20 percent

Kaks and similar soils—15 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Kalkaska

Depth class: Very deep

Drainage class: Somewhat excessively drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

McMillan

Depth class: Very deep

Drainage class: Well drained

Parent material: Sand

Texture of the surface layer: Sand

Slope class: Level to very steep

Kaks

Depth class: Very deep

Drainage class: Well drained

Parent material: Loamy material over sand

Texture of the surface layer: Sandy loam

Slope class: Level to very steep

Soils of Minor Extent

- Dawson, Pickford, and Tawas soils in depressions
- Wallace soils in landscape positions slightly lower than those of the Kalkaska soils
- Menominee soils in landscape positions similar to those of the McMillan soils

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and seedling mortality

Management considerations:

- Loose sand can interfere with the traction of logging equipment.

- Building roads on the contour can help to control erosion.
- Using containerized planting stock helps to prevent seedling mortality in areas of these droughty soils.

12. Sporley-Fence Association

Very deep, level to steep, well drained and moderately well drained, loamy soils

Setting

Landform: Recessional moraines

Slope range: 0 to 60 percent

Composition

Extent of the association: 2 percent of the survey area

Extent of the soils in the association:

Sporley and similar soils—40 percent

Fence and similar soils—35 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Sporley

Depth class: Very deep

Drainage class: Well drained

Parent material: Loamy glaciolacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Nearly level to steep

Fence

Depth class: Very deep

Drainage class: Moderately well drained

Parent material: Loamy glaciolacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level and nearly level

Soils of Minor Extent

- Dawson soils in depressions
- Paquin soils in landscape positions similar to those of the Fence soils
- Wallace and Liminga soils in landscape positions similar to those of the Sporley soils

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, erosion hazard, and plant competition

Management considerations:

- The seasonal high water table in areas of the Fence soils restricts the use of equipment to summer or winter.
- Building roads on the contour can help to control erosion.
- Site preparation by mechanical or chemical means helps to control plant competition.

Soils on Till-Floored Lake Plains

13. Hendrie-Annianias Association

Very deep, level and nearly level, poorly drained and somewhat poorly drained, loamy soils

Setting

Landform: Till-floored lake plains

Slope range: 0 to 3 percent

Composition

Extent of the association: 5 percent of the survey area

Extent of the soils in the association:

Hendrie and similar soils—40 percent

Annianias and similar soils—35 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Hendrie

Depth class: Very deep

Drainage class: Poorly drained

Parent material: Loamy lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level

Annianias

Depth class: Very deep

Drainage class: Somewhat poorly drained

Parent material: Loamy lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level and nearly level

Soils of Minor Extent

- Auger soils in the slightly higher landscape positions
- Zandi and Liminga soils in the higher landscape positions
- Lupton soils in depressions

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, windthrow hazard, and plant competition

Management considerations:

- The seasonal high water table in areas of these soils restricts the use of equipment to summer or winter.
- Harvest methods that reduce the windthrow hazard should be used.

14. Millecoquins-Rudyard-Pickford Association

Very deep, level to gently sloping, moderately well drained to poorly drained, loamy and clayey soils

Setting

Landform: Till-floored lake plains

Slope range: 0 to 6 percent

Composition

Extent of the association: 1 percent of the survey area

Extent of the soils in the association:

Millecoquins and similar soils—40 percent

Rudyard and similar soils—25 percent

Pickford and similar soils—20 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Millecoquins

Depth class: Very deep

Drainage class: Moderately well drained

Parent material: Loamy glaciolacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level to gently sloping

Rudyard

Depth class: Very deep

Drainage class: Somewhat poorly drained

Parent material: Clayey lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level and nearly level

Pickford

Depth class: Very deep

Drainage class: Poorly drained

Parent material: Clayey lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level

Soils of Minor Extent

- Lupton soils in depressions
- Sugar and Ontonagon soils in landscape positions similar to those of the Millecoquins soils

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, windthrow hazard, and plant competition

Management considerations:

- The seasonal high water table in areas of these soils restricts the use of equipment to summer or winter.
- Harvest methods that reduce the windthrow hazard should be used.

Soils on Lake Plains

15. Loxley-Pickford-Annanias Association

Very deep, level and nearly level, very poorly drained, organic soils; poorly drained, clayey soils; and somewhat poorly drained, loamy soils

Setting

Landform: Lake plains

Slope range: 0 to 3 percent

Composition

Extent of the association: 9 percent of the survey area

Extent of the soils in the association:

Loxley and similar soils—35 percent

Pickford and similar soils—25 percent

Annanias and similar soils—15 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Loxley

Depth class: Very deep

Drainage class: Very poorly drained

Parent material: Peat

Texture of the surface layer: Peat

Slope class: Level

Pickford

Depth class: Very deep

Drainage class: Poorly drained

Parent material: Clayey lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level

Annanias

Depth class: Very deep

Drainage class: Somewhat poorly drained

Parent material: Loamy lacustrine sediments

Texture of the surface layer: Silt loam

Slope class: Level and nearly level

Soils of Minor Extent

- Lupton and Dorval soils in landscape positions similar to those of the Loxley soils
- Hendrie soils in landscape positions similar to those of the Pickford soils
- Finch soils in landscape positions similar to those of the Annanias soils

Use and Management

Land use: Woodland

Major management concerns: Equipment limitations, windthrow hazard, and plant competition

Management considerations:

- Opportunities for logging in areas of the Loxley soils are limited because the soils support very few trees. Low strength also limits logging activities.
- The seasonal high water table in areas of the Pickford and Annanias soils restricts the use of equipment to summer or winter.
- Harvest methods that reduce the windthrow hazard should be used.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

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

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

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown

on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Zandi silt loam, 6 to 15 percent slopes, is a phase of the Zandi series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Hendrie-Annian complex, 0 to 3 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Histosols and Aquents, ponded, is an undifferentiated group in this survey area.

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

10D—Ontonagon silt loam, 6 to 15 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Ontonagon and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Rudyard soils in the slightly lower landscape positions

Typical Profile

Ontonagon

A—0 to 7 inches; dark brown silt loam

B/E—7 to 13 inches; reddish brown silty clay and brown silt loam

Bt—13 to 21 inches; reddish brown clay

BC—21 to 32 inches; reddish brown clay

C—32 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Clayey glaciolacustrine deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Slight

Surface runoff class: Very high

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Skidders should not be used during wet periods, when ruts form easily.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 0a

Habitat type: ATD

15B—Liminga fine sand, 0 to 6 percent slopes

Setting

Landform: Ground moraines and lake plains

Map Unit Composition

Liminga and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the Liminga soil
- The somewhat poorly drained Wainola soils in the slightly lower landscape positions

Typical Profile

Liminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 5a

Habitat type: ATD

15D—Liminga fine sand, 6 to 15 percent slopes

Setting

Landform: Ground moraines and lake plains

Map Unit Composition

Liminga and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusion:

- The well drained Alcona soils in landscape positions similar to those of the Liminga soil
- The somewhat poorly drained Wainola soils in the slightly lower landscape positions

Typical Profile

Liminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand
 Bs—9 to 22 inches; strong brown fine sand
 BC—22 to 31 inches; brownish yellow fine sand
 C—31 to 80 inches; brownish yellow fine sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits
Slope: 6 to 15 percent
Hazard of soil blowing: Severe
Surface runoff class: Very low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3e
Michigan soil management group: 5a
Habitat type: ATD

15E—Liminga fine sand, 15 to 35 percent slopes

Setting

Landform: Ground moraines and lake plains

Map Unit Composition

Liminga and similar soils: 90 to 100 percent
 Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the Liminga soil

Typical Profile**Liminga**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: 5a

Habitat type: ATD

15F—Liminga fine sand, 35 to 60 percent slopes

Setting

Landform: Ground moraines and lake plains

Map Unit Composition

Liminga and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the Liminga soil

Typical Profile

Liminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 35 to 60 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: 5a

Habitat type: ATD

16B—Graveraet fine sandy loam, 0 to 4 percent slopes***Setting***

Landform: Ground moraines

Map Unit Composition

Graveraet and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Menominee soils in landscape positions similar to those of the Graveraet soil
- The somewhat poorly drained Solona soils in the slightly lower landscape positions

Typical Profile**Graveraet**

Oi—0 to 1 inch; slightly decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 7 inches; brown fine sandy loam

Bhs—7 to 10 inches; dark reddish brown fine sandy loam

Bs—10 to 17 inches; dark brown fine sandy loam

E/Bx—17 to 33 inches; mottled brown loamy sand and reddish loam

B/E—33 to 48 inches; reddish brown sandy clay loam and brown loamy sand

Bt—48 to 68 inches; reddish brown sandy clay loam

C—68 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Till

Slope: 0 to 4 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: 14 to 24 inches to a fragipan

Drainage class: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate in the upper part; slow in the middle part; moderate or moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: 1 foot (March, April, May, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 2e

Michigan soil management group: 3a-f

Habitat type: Primary—AVO; secondary—AVO-a

17C—Deer Park sand, 0 to 10 percent slopes***Setting***

Landform: Dunes and beach ridges

Map Unit Composition

Deer Park and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Croswell soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile**Deer Park**

Oa—0 to 2 inches; black, highly decomposed plant material

A—2 to 3 inches; very dark gray sand

E—3 to 10 inches; light gray sand

Bs—10 to 21 inches; dark yellowish brown and strong brown sand

BC—21 to 33 inches; light brown sand

C—33 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands and beach sands

Slope: 0 to 10 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: Primary—PVC; secondary—QAE

17E—Deer Park sand, 10 to 25 percent slopes

Setting

Landform: Dunes and beach ridges

Map Unit Composition

Deer Park and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Croswell soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile

Deer Park

Oa—0 to 2 inches; black, highly decomposed plant material

A—2 to 3 inches; very dark gray sand

E—3 to 10 inches; light gray sand

Bs—10 to 21 inches; dark yellowish brown and strong brown sand

BC—21 to 33 inches; light brown sand
 C—33 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands and beach sand
Slope: 10 to 25 percent
Hazard of soil blowing: Severe
Surface runoff class: Low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of the slope, this soil is poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, this soil is generally unsuited to use as a site for septic tank absorption fields.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: 5.3a
Habitat type: Primary—PVC; secondary—QAE

17F—Deer Park sand, 25 to 60 percent slopes

Setting

Landform: Dunes and beach ridges

Map Unit Composition

Deer Park and similar soils: 95 to 100 percent

Contrasting inclusions: 0 to 5 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions

Typical Profile

Deer Park

Oa—0 to 2 inches; black, highly decomposed plant material

A—2 to 3 inches; very dark gray sand

E—3 to 10 inches; light gray sand

Bs—10 to 21 inches; dark yellowish brown and strong brown sand

BC—21 to 33 inches; light brown sand

C—33 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands and beach sands

Slope: 25 to 60 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: Primary—PVC; secondary—QAE

18B—Rubicon sand, 0 to 6 percent slopes***Setting***

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile**Rubicon**

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

Bs—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland (fig. 3); other uses—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.



Figure 3.—This burned white pine stump is a remnant of the logging era of the early 1900s. It is in an area of Rubicon sand, 0 to 6 percent slopes. After millions of pine trees were harvested, fires burned thousands of acres of the slash that remained on the ground. The Civilian Conservation Corps planted this area to red pine and jack pine in the 1930s.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5.3a

Habitat type: AQVac

18D—Rubicon sand, 6 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile

Rubicon

O_i—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

B_s—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: AQVac

18E—Rubicon sand, 15 to 35 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions

Typical Profile

Rubicon

O_i—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

B_s—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: AQVac

18F—Rubicon sand, 35 to 60 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 100 percent

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

Bs—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 35 to 60 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: AQVac

19B—Kalkaska sand, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Deford soils in depressions
- The moderately well drained Paquin soils in the slightly lower landscape positions
- The somewhat poorly drained Finch soils in drainageways

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits and sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5a

Habitat type: ATD

19D—Kalkaska sand, 6 to 15 percent slopes***Setting***

Landform: Disintegration moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Deford soils in depressions
- The somewhat poorly drained Finch soils in drainageways
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile**Kalkaska**

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits and sandy outwash

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other use—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5a

Habitat type: ATD

19E—Kalkaska sand, 15 to 35 percent slopes***Setting***

Landform: Disintegration moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 100 percent

Typical Profile

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits and sandy outwash

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5a

Habitat type: ATD

19F—Kalkaska sand, 35 to 60 percent slopes

Setting

Landform: Outwash plains and disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 100 percent

Typical Profile

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits and sandy outwash

Slope: 35 to 60 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5a

Habitat type: ATD

20B—Crowell sand, 0 to 6 percent slopes

Setting

Landform: Lake plains, stream terraces, dunes, and outwash plains

Map Unit Composition

Crowell and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions
- The excessively drained Rubicon soils in the slightly higher landscape positions

Typical Profile

Crowell

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; light brownish gray sand

Bs—6 to 15 inches; dark brown and strong brown sand

BC—15 to 22 inches; brownish yellow sand

C—22 to 80 inches; light yellowish brown, mottled sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 2 feet (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5a

Habitat type: AQVac

21A—Finch sand, 0 to 3 percent slopes

Setting

Landform: Lake plains and outwash plains

Map Unit Composition

Finch and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Spot soils in the lower landscape positions
- The moderately well drained Paquin soils in the slightly higher landscape positions

Typical Profile

Finch

O_e—0 to 1 inch; moderately decomposed plant material

E—1 to 11 inches; pinkish gray sand

B_{sm}—11 to 42 inches; dark brown, brown, and dark reddish brown, mottled sand

C—42 to 80 inches; yellowish brown fine sand

Soil Properties and Qualities

Parent material: Outwash

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Moderate

Depth to restrictive feature: 7 to 13 inches to ortstein

Drainage class: Somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: 0.5 foot (April, May) (fig. 4)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 4w

Michigan soil management group: 5b-h

Habitat type: TMC-Vac

22—Spot peat

Setting

Landform: Lake plains, ground moraines, and outwash plains

Map Unit Composition

Spot and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent



Figure 4.—Piezometers installed in an area of Finch sand, 0 to 3 percent slopes. This water table study was conducted for a period of 5 years, and the data were used in the table showing soil moisture status by depth (table 19).

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the slightly higher landscape positions
- The very poorly drained Dawson soils in the lower landscape positions

Typical Profile

Spot

O_i—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

B_{hsm}—8 to 10 inches; dark reddish brown sand

B_s—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits and outwash

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: 8 to 12 inches to ortstein

Drainage class: Poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, May, October, November, December)

Months in which ponding does not occur: January, February, June, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: 5c-h

Habitat type: TTS

23—Leafriver mucky peat

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Leafriver and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the slightly higher landscape positions
- The very poorly drained Tawas soils in landscape positions similar to those of the Leafriver soil

Typical Profile

Leafriver

Oe—0 to 2 inches; black mucky peat

Oa—2 to 8 inches; black muck

A—8 to 10 inches; black, mottled loamy fine sand

Cg—10 to 80 inches; grayish brown and dark grayish brown, mottled fine sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, May, October, November, December)

Months in which ponding does not occur: January, February, June, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: 5c

Habitat type: F1

24B—Springlake loamy coarse sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Springlake and similar soils: 100 percent

Typical Profile

O_i—0 to 1 inch; slightly decomposed plant material

A—1 to 7 inches; very dark grayish brown loamy coarse sand

E—7 to 9 inches; grayish brown loamy coarse sand

Bhs—9 to 14 inches; dark brown loamy coarse sand
 Bs—14 to 23 inches; strong brown loamy coarse sand
 2BC—23 to 26 inches; strong brown gravelly coarse sand
 2C—26 to 80 inches; light yellowish brown gravelly coarse sand

Soil Properties and Qualities

Parent material: Outwash
Slope: 0 to 6 percent
Hazard of soil blowing: Moderate
Surface runoff class: Negligible
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Available water capacity: Very low
Shrink-swell potential: Low
Permeability: Very rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s
Michigan soil management group: 5a
Habitat type: AVO

29A—Solona fine sandy loam, 0 to 3 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Solona and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Graveraet soils in the slightly higher landscape positions
- The poorly drained Ensley soils in the slightly lower landscape positions

Typical Profile

Solona

A—0 to 6 inches; black fine sandy loam
 E—6 to 18 inches; brown, mottled fine sandy loam
 Bt—18 to 25 inches; brown, mottled fine sandy loam
 2C—25 to 80 inches; brown gravelly fine sandy loam

Soil Properties and Qualities

Parent material: Loamy till
Slope: 0 to 3 percent
Hazard of soil blowing: Moderate
Surface runoff class: Very low
Potential for frost action: Moderate
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Available water capacity: Moderate
Shrink-swell potential: Low
Permeability: Moderate
Flooding: None
Depth to seasonal high water table: 0.5 foot (April, May)
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 2w
Michigan soil management group: 3b
Habitat type: Primary—AVO-CI; secondary—TMC

30—Kinross muck

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Kinross and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the slightly higher landscape positions
- The very poorly drained Dawson soils in landscape positions similar to those of the Kinross soil

Typical Profile**Kinross**

Oa—0 to 3 inches; dark reddish brown muck

Eg—3 to 14 inches; grayish brown and dark gray sand

Bhs—14 to 22 inches; dark brown sand

Bs—22 to 35 inches; dark yellowish brown sand

C—35 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 2 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, October, November, December)

Months in which ponding does not occur: January, February, June, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: 5c-a
Habitat type: TTS

31B—McMillan fine sandy loam, 0 to 6 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska and well drained Trenary soils in landscape positions similar to those of the McMillan soil

Typical Profile

McMillan

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 4 inches; very dark gray fine sandy loam
 E—4 to 6 inches; brown fine sandy loam
 Bhs—6 to 9 inches; dark brown very fine sandy loam
 Bs1—9 to 16 inches; brown very fine sandy loam
 Bs2—16 to 22 inches; strong brown loamy fine sand
 Bw—22 to 32 inches; reddish yellow sand
 E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits
Slope: 0 to 6 percent
Hazard of soil blowing: Moderate
Surface runoff class: Low
Potential for frost action: Moderate
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: Moderate
Shrink-swell potential: Low
Permeability: Moderate in the upper part and rapid in the lower part
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland

Cropland

- Crop rotations that include close-growing crops, conservation tillage, grassed waterways, cover crops, and crop residue management help to control runoff and water erosion.
- Conservation tillage, windbreaks, crop residue management, and cover crops help to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.

- Increasing the content of organic matter in the root zone may increase the ability of the soil to hold water, nutrients, and pesticides and reduce the risk of ground-water pollution.
- The amount of nutrients in manure and fertilizer applications should not exceed the nutrient requirements of the plants.

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 4a

Habitat type: Primary—AVO; secondary—ATD

31D—McMillan fine sandy loam, 6 to 15 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska and well drained Trenary soils in landscape positions similar to those of the McMillan soil

Typical Profile

McMillan

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 6 inches; brown fine sandy loam

Bhs—6 to 9 inches; dark brown very fine sandy loam

Bs1—9 to 16 inches; brown very fine sandy loam

Bs2—16 to 22 inches; strong brown loamy fine sand

Bw—22 to 32 inches; reddish yellow sand

E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: Moderate
Shrink-swell potential: Low
Permeability: Moderate in the upper part and rapid in the lower part
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4e
Michigan soil management group: 4a
Habitat type: Primary—AVO; secondary—ATD

31E—McMillan fine sandy loam, 15 to 35 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 90 to 100 percent
 Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the McMillan soil

Typical Profile

McMillan

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 4 inches; very dark gray fine sandy loam
 E—4 to 6 inches; brown fine sandy loam
 Bhs—6 to 9 inches; dark brown very fine sandy loam
 Bs1—9 to 16 inches; brown very fine sandy loam

Bs2—16 to 22 inches; strong brown loamy fine sand

Bw—22 to 32 inches; reddish yellow sand

E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: 4a

Habitat type: Primary—AVO; secondary—ATD

31F—McMillan fine sandy loam, 35 to 60 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the McMillan soil

Typical Profile**McMillan**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 6 inches; brown fine sandy loam

Bhs—6 to 9 inches; dark brown very fine sandy loam

Bs1—9 to 16 inches; brown very fine sandy loam

Bs2—16 to 22 inches; strong brown loamy fine sand

Bw—22 to 32 inches; reddish yellow sand

E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 35 to 60 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: 4a

Habitat type: Primary—AVO; secondary—ATD

32A—Allendale loamy fine sand, 0 to 3 percent slopes

Setting

Landform: Lake plains and outwash plains

Map Unit Composition

Allendale and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch and Rudyard soils in landscape positions similar to those of the Allendale soil

Typical Profile

Allendale

Ap—0 to 5 inches; black loamy fine sand

E—5 to 8 inches; pinkish gray fine sand

Bhs—8 to 10 inches; dark reddish brown loamy fine sand

Bs—10 to 31 inches; strong brown fine sand

2Bt—31 to 35 inches; reddish brown silty clay

2C—35 to 80 inches; light reddish brown silty clay

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits over clayey glaciolacustrine deposits

Slope: 0 to 3 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Rapid in the upper part and slow or very slow in the lower part

Flooding: None

Depth to seasonal high water table: 1 foot (April, May, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.

- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3w

Michigan soil management group: 4/1b

Habitat type: TMC-D

33—Pits, sand and gravel

Map Unit Composition

Pits: 100 percent

Use and Management

Land use: Dominant use—source of sand and gravel

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

35—Histosols and Aquents, ponded

Map Unit Composition

Histosols and similar soils: 0 to 100 percent

Aquents and similar soils: 0 to 100 percent

Typical Profile

Histosols

0 to 51 inches; muck

51 to 80 inches; variable

Aquents

0 to 80 inches; variable

Soil Properties and Qualities

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Variable

Flooding: None

Depth to seasonal high water table: At the surface (all year)

Deepest ponding: 1 foot (all year)

Use and Management

Land use: Wetland wildlife habitat

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

Interpretive Groups

Land capability classification: 8w

Michigan soil management group: None assigned

Habitat type: None assigned

36—Carbondale, Lupton, and Tawas soils

Setting

Landform: Outwash plains

Map Unit Composition

Carbondale and similar soils: 0 to 100 percent

Lupton and similar soils: 0 to 100 percent

Tawas and similar soils: 0 to 100 percent

Contrasting inclusions: 0 to 25 percent

Contrasting inclusions:

- The poorly drained Deford soils in landscape positions similar to those of the major soils
- The moderately well drained Paquin and Kalkaska soils in the higher landscape positions

Typical Profile

Carbondale

Oa—0 to 38 inches; black muck

Oe—38 to 80 inches; black mucky peat

Lupton

Oi—0 to 4 inches; peat

Oa—4 to 80 inches; black muck

Tawas

Oa—0 to 26 inches; black muck

2C—26 to 80 inches; dark brown and light brownish gray sand

Soil Properties and Qualities

Parent material: Carbondale—organic, herbaceous material; Lupton—organic, woody material; Tawas—organic, woody material over glacial drift

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Very high

Shrink-swell potential: Low

Permeability: Carbondale and Lupton—moderate; Tawas—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, May, June, October, November, December)

Months in which ponding does not occur: January, February, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, June, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because of wetness and low strength, special harvesting equipment is needed. The equipment can be used only during periods in winter when skid roads and access roads are frozen.
- Because of low strength, suitable surfacing material is needed on year-round roads and landings.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on these soils.

Building site development

- Because of ponding, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding and low strength, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: Carbondale and Lupton—Mc; Tawas—M/4c

Habitat type: Primary—TTM; secondary—TTS

37—Dawson, Greenwood, and Loxley soils

Setting

Landform: Bogs and swamps

Map Unit Composition

Dawson and similar soils: 0 to 100 percent

Greenwood and similar soils: 0 to 100 percent

Loxley and similar soils: 0 to 100 percent

Contrasting inclusions: 0 to 25 percent

Contrasting inclusions:

- The poorly drained Spot soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Finch soils in the slightly higher landscape positions
- The moderately well drained Paquin soils in the higher landscape positions

Typical Profile

Dawson

Oi—0 to 10 inches; reddish brown peat

Oe—10 to 19 inches; very dark gray mucky peat

Oa—19 to 38 inches; black muck

C—38 to 80 inches; dark brown, mottled fine sand

Greenwood

Oe—0 to 65 inches; black mucky peat

Oa—65 to 80 inches; black muck

Loxley

Oi—0 to 8 inches; dark yellowish brown peat

Oa—8 to 80 inches; black and dark reddish brown muck

Soil Properties and Qualities

Parent material: Dawson—organic, herbaceous material over sandy glaciofluvial deposits; Greenwood and Loxley—organic, herbaceous material

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Very high

Shrink-swell potential: Low

Permeability: Dawson—moderate in the upper part and rapid in the lower part; Greenwood and Loxley—moderate

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, May, June, September, October, November, December)

Months in which ponding does not occur: July, August, September

Deepest ponding: Dawson and Greenwood—0.5 foot (April, May); Loxley—0.5 foot (April, May, November)

Use and Management

Land use: Dominant use—wildlife habitat

Woodland

- Opportunities for logging are limited because the soils support very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of these soils to winter, when roads may be frozen.

Building site development

- Because of ponding, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding and low strength, these soils are generally unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: Dawson—M/4c-a; Greenwood and Loxley—Mc-a

Habitat type: PCS

45D—Rubicon-Spot complex, 0 to 15 percent slopes***Setting***

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 45 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil

Typical Profile**Rubicon**

Oi—0 to 2 inches; slightly decomposed plant material
 E—2 to 5 inches; light brownish gray sand
 Bs—5 to 30 inches; dark brown and strong brown sand
 BC—30 to 38 inches; yellowish brown sand
 C—38 to 80 inches; light yellowish brown and pale brown sand

Spot

Oi—0 to 2 inches; very dark brown peat
 E—2 to 8 inches; light brownish gray sand
 Bhsm—8 to 10 inches; dark reddish brown sand
 Bs—10 to 18 inches; dark brown and strong brown sand
 C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Rubicon—2 to 15 percent; Spot—0 to 2 percent

Hazard of soil blowing: Rubicon—severe; Spot—slight

Surface runoff class: Rubicon—very low; Spot—negligible

Potential for frost action: Rubicon—low; Spot—moderate

Depth to restrictive feature: Rubicon—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Rubicon—excessively drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rubicon—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rubicon—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Rubicon—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Rubicon—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Rubicon soil, loose sand can interfere with the traction of wheeled equipment. Logging roads should be stabilized.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads in areas of the Spot soil require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites on the Spot soil generally can be used only during the driest time of year.

- Because of wetness, seedling mortality, and plant competition, trees are generally not planted in areas of the Spot soil.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Rubicon soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- Because of ponding, the Spot soil is generally unsuited to building site development.

Septic tank absorption fields

- In areas of the Rubicon soil, land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Rubicon soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Because of ponding, the Spot soil is generally unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: Rubicon—7s; Spot—5w

Michigan soil management group: Rubicon—5.3a; Spot—5c-h

Habitat type: Rubicon—AQVac; Spot—TTS

45E—Rubicon-Spot complex, 0 to 35 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 45 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil

Typical Profile

Rubicon

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

Bs—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Rubicon—2 to 35 percent; Spot—0 to 2 percent

Hazard of soil blowing: Rubicon—severe; Spot—slight

Surface runoff class: Rubicon—very low; Spot—negligible

Potential for frost action: Rubicon—low; Spot—moderate

Depth to restrictive feature: Rubicon—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Rubicon—excessively drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rubicon—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rubicon—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Rubicon—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Rubicon—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Loose sand in areas of the Rubicon soil can interfere with the traction of wheeled equipment. Logging roads should be stabilized.
- Because of the slope in areas of the Rubicon soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard in areas of the Rubicon soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads in areas of the Spot soil require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites on the Spot soil generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted in areas of the Spot soil.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Rubicon soil, and the ponding is a concern in areas of the Spot soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Rubicon soil, and the ponding is a concern in areas of the Spot soil.

Interpretive Groups

Land capability classification: Rubicon—7s; Spot—5w

Michigan soil management group: Rubicon—5.3a; Spot—5c-h

Habitat type: Rubicon—AQVac; Spot—TTS

46B—Kalkaska loamy sand, 0 to 6 percent slopes***Setting***

Landform: Moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile**Kalkaska**

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 6 inches; brown loamy sand

Bhs—6 to 8 inches; dark reddish brown loamy sand

Bs1—8 to 12 inches; strong brown loamy sand

Bs2—12 to 23 inches; strong brown sand

BC—23 to 38 inches; strong brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland (fig. 5); other uses—cropland

Cropland

- Crop rotations that include close-growing crops, conservation tillage, grassed waterways, cover crops, and crop residue management help to control runoff and water erosion.



Figure 5.—A stand of planted red pine in an area of Kalkaska loamy sand, 0 to 6 percent slopes. This soil is well suited to use as woodland and can produce good yields of quality red pine.

- Conservation tillage, windbreaks, crop residue management, and cover crops help to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.

- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 4a

Habitat type: ATD

46D—Kalkaska loamy sand, 6 to 15 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Kalkaska

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 6 inches; brown loamy sand

Bhs—6 to 8 inches; dark reddish brown loamy sand

Bs1—8 to 12 inches; strong brown loamy sand

Bs2—12 to 23 inches; strong brown sand

BC—23 to 38 inches; strong brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 4a

Habitat type: ATD

46E—Kalkaska loamy sand, 15 to 35 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Kalkaska and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Kalkaska

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 6 inches; brown loamy sand

Bhs—6 to 8 inches; dark reddish brown loamy sand

Bs1—8 to 12 inches; strong brown loamy sand

Bs2—12 to 23 inches; strong brown sand

BC—23 to 38 inches; strong brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 4a

Habitat type: ATD

46F—Kalkaska loamy sand, 35 to 60 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Kalkaska and similar soils: 100 percent

Typical Profile

Oe—0 to 1 inch; black, moderately decomposed plant material
 E—1 to 6 inches; brown loamy sand
 Bh_s—6 to 8 inches; dark reddish brown loamy sand
 Bs₁—8 to 12 inches; strong brown loamy sand
 Bs₂—12 to 23 inches; strong brown sand
 BC—23 to 38 inches; strong brown sand
 C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: 35 to 60 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: 4a
Habitat type: ATD

47B—Trenary fine sandy loam, 2 to 6 percent slopes

Setting

Landform: Ground moraines and end moraines

Map Unit Composition

Trenary and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Menominee soils in landscape positions similar to those of the Trenary soil
- The somewhat poorly drained Solona soils in the lower landscape positions

Typical Profile

Trenary

A—0 to 2 inches; very dark gray fine sandy loam
 E—2 to 6 inches; brown fine sandy loam
 Bhs—6 to 12 inches; dark reddish brown fine sandy loam
 Bs—12 to 17 inches; reddish brown fine sandy loam
 E'—17 to 26 inches; reddish brown sandy loam

Bt—26 to 37 inches; dark reddish brown sandy clay loam

C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Loamy till

Slope: 2 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland (fig. 6); other uses—cropland and pasture

Cropland

- Crop rotations that include close-growing crops, conservation tillage, grassed waterways, cover crops, and crop residue management help to control runoff and water erosion.
- Conservation tillage, windbreaks, crop residue management, and cover crops help to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.

Pasture

- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Proper stocking rates, controlled grazing, and restricted use during dry periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to soil tests helps to ensure the maximum growth of plants.

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- No major concerns affect the use of this soil for building site development.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 2e

Michigan soil management group: 3a

Habitat type: AVO



Figure 6.—Maple syrup production in an area of Trenary fine sandy loam, 2 to 6 percent slopes. This soil is one of the most productive for hardwoods in the county.

47D—Trenary fine sandy loam, 6 to 15 percent slopes

Setting

Landform: Ground moraines and end moraines

Map Unit Composition

Trenary and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Ensley soils in depressions
- The well drained Menominee soils in landscape positions similar to those of the Trenary soil

Typical Profile

Trenary

A—0 to 2 inches; very dark gray fine sandy loam

E—2 to 6 inches; brown fine sandy loam

Bhs—6 to 12 inches; dark reddish brown fine sandy loam

Bs—12 to 17 inches; reddish brown fine sandy loam

E'—17 to 26 inches; reddish brown sandy loam

Bt—26 to 37 inches; dark reddish brown sandy clay loam

C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Loamy till

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland and pasture

Cropland

- Crop rotations that include close-growing crops, conservation tillage, grassed waterways, cover crops, and crop residue management help to control runoff and water erosion.
- Conservation tillage, windbreaks, crop residue management, and cover crops help to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.

Pasture

- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Proper stocking rates, controlled grazing, and restricted use during dry periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to soil tests helps to ensure the maximum growth of plants.

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 3a

Habitat type: AVO

53B—Menominee sand, sandy substratum, 2 to 6 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Menominee and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska and well drained Trenary soils in landscape positions similar to those of the Menominee soil

Typical Profile

Menominee

O_e—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown sand

B_{hs}—8 to 11 inches; dark reddish brown sand

B_s—11 to 34 inches; brown and strong brown sand

2B/E—34 to 46 inches; reddish brown clay loam and reddish gray fine sandy loam

2C—46 to 62 inches; reddish brown loam

3C—62 to 80 inches; stratified light reddish brown sand to reddish brown and yellowish red loamy sand

Soil Properties and Qualities

Parent material: Sandy outwash over loamy till

Slope: 2 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 4/2a

Habitat type: AVO

57B—Amadon-Longrie sandy loams, 1 to 6 percent slopes, rocky

Setting

Landform: Ground moraines

Map Unit Composition

Amadon and similar soils: 30 to 60 percent

Longrie and similar soils: 30 to 60 percent

Rock outcrop: 1 to 10 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Battydoe soils in landscape positions similar to those of the major soils

Typical Profile

Amadon

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 8 inches; pinkish gray sandy loam

Bhs—8 to 10 inches; dark reddish brown fine sandy loam

Bs—10 to 15 inches; dark brown fine sandy loam

2R—15 to 80 inches; unweathered bedrock

Longrie

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 2 inches; highly decomposed plant material

E—2 to 6 inches; reddish gray sandy loam

Bhs—6 to 8 inches; dark reddish brown fine sandy loam

Bs—8 to 23 inches; dark brown fine sandy loam

C—23 to 36 inches; brown sandy loam

2R—36 to 80 inches; fractured limestone bedrock

Soil Properties and Qualities

Parent material: Coarse-loamy till

Slope: 1 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Moderate

Depth to restrictive feature: Amadon—10 to 20 inches to bedrock (lithic); Longrie—20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Available water capacity: Amadon—very low; Longrie—low

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The shallow depth to bedrock should be considered when road locations and landing sites are planned.

Building site development

- Excavation is hampered by the shallow depth to hard bedrock.

Septic tank absorption fields

- Because of the depth to bedrock, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Amadon—3s; Longrie—2e

Michigan soil management group: Amadon—Ra; Longrie—3/Ra

Habitat type: Amadon—ATD; Longrie—AVO

57D—Amadon-Longrie sandy loams, 6 to 15 percent slopes, rocky

Setting

Landform: Ground moraines

Map Unit Composition

Amadon and similar soils: 30 to 60 percent

Longrie and similar soils: 30 to 60 percent

Rock outcrop: 1 to 10 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Battydoe soils in landscape positions similar to those of the major soils

Typical Profile

Amadon

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 8 inches; pinkish gray sandy loam

Bhs—8 to 10 inches; dark reddish brown fine sandy loam

Bs—10 to 15 inches; dark brown fine sandy loam

2R—15 to 80 inches; unweathered bedrock

Longrie

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 2 inches; highly decomposed plant material

E—2 to 6 inches; reddish gray sandy loam

Bhs—6 to 8 inches; dark reddish brown fine sandy loam

Bs—8 to 23 inches; dark brown fine sandy loam

C—23 to 36 inches; brown sandy loam

2R—36 to 80 inches; fractured limestone bedrock

Soil Properties and Qualities

Parent material: Coarse-loamy till

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: Amadon—10 to 20 inches to bedrock (lithic); Longrie—20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Available water capacity: Amadon—very low; Longrie—low

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The shallow depth to bedrock should be considered when road locations and landing sites are planned.

Building site development

- Excavation is hampered by the shallow depth to hard bedrock.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Because of the depth to bedrock, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: Amadon—Ra; Longrie—3/Ra

Habitat type: Amadon—ATD; Longrie—AVO

57E—Amadon-Longrie sandy loams, 15 to 35 percent slopes, rocky

Setting

Landform: Ground moraines

Map Unit Composition

Amadon and similar soils: 30 to 60 percent

Longrie and similar soils: 30 to 60 percent

Rock outcrop: 1 to 10 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Battydoe soils in landscape positions similar to those of the major soils

Typical Profile**Amadon**

Oe—0 to 2 inches; moderately decomposed plant material
 E—2 to 8 inches; pinkish gray sandy loam
 Bhs—8 to 10 inches; dark reddish brown fine sandy loam
 Bs—10 to 15 inches; dark brown fine sandy loam
 2R—15 to 80 inches; unweathered bedrock

Longrie

Oe—0 to 1 inch; moderately decomposed plant material
 Oa—1 to 2 inches; highly decomposed plant material
 E—2 to 6 inches; reddish gray sandy loam
 Bhs—6 to 8 inches; dark reddish brown fine sandy loam
 Bs—8 to 23 inches; dark brown fine sandy loam
 C—23 to 36 inches; brown sandy loam
 2R—36 to 80 inches; fractured limestone bedrock

Soil Properties and Qualities

Parent material: Coarse-loamy till

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: Amadon—10 to 20 inches to bedrock (lithic); Longrie—20 to 40 inches to bedrock (lithic)

Drainage class: Well drained

Available water capacity: Amadon—very low; Longrie—low

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope and the depth to bedrock, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: Amadon—Ra; Longrie—3/Ra

Habitat type: Amadon—ATD; Longrie—AVO

60A—Kinross-Au Gres complex, 0 to 3 percent slopes***Setting***

Landform: Outwash plains and lake plains

Map Unit Composition

Kinross and similar soils: 40 to 60 percent

Au Gres and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 20 percent

Contrasting inclusions:

The moderately well drained Croswell soils in the slightly higher landscape positions

- The very poorly drained Dawson soils in landscape positions similar to those of the Kinross soil

Typical Profile**Kinross**

Oa—0 to 3 inches; dark reddish brown muck

Eg—3 to 14 inches; grayish brown and dark gray sand

Bhs—14 to 22 inches; dark brown sand

Bs—22 to 35 inches; dark yellowish brown sand

C—35 to 80 inches; yellowish brown sand

Au Gres

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; light brownish gray sand

Bs—7 to 17 inches; strong brown and dark brown, mottled sand

BC—17 to 28 inches; brown, mottled sand

C—28 to 80 inches; light yellowish brown and pale brown, mottled sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Kinross—0 to 2 percent; Au Gres—0 to 3 percent

Hazard of soil blowing: Kinross—moderate; Au Gres—severe

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Kinross—poorly drained; Au Gres—somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: Kinross—at the surface (January, February, March, April, October, November, December); Au Gres—0.5 foot to 6.7 feet (April, May)

Deepest ponding: Kinross—0.2 foot (March, April); Au Gres—none

Months in which ponding does not occur: Kinross—January, February, June, July, August, September, December; Au Gres—all year

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on the Kinross soil.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- The Kinross soil is generally unsuited to building site development because of ponding.
- In areas of the Au Gres soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The Kinross soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.
- The poor filtering capacity of the Au Gres soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Filling or mounding with suitable material helps to raise the absorption field above the water table in areas of the Au Gres soil.

Interpretive Groups

Land capability classification: Kinross—6w; Au Gres—4w

Michigan soil management group: Kinross—5c-a; Au Gres—5b

Habitat type: Kinross—TTS; Au Gres—TMC-Vac

61B—Paquin sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Paquin and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the slightly lower landscape positions
- The well drained Wallace soils in the slightly higher landscape positions

Typical Profile**Paquin**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 12 inches; brown sand

Bhs—12 to 14 inches; very dark brown sand

Bhsm—14 to 17 inches; very dark brown sand

Bsm—17 to 27 inches; dark brown sand

BC—27 to 34 inches; strong brown, mottled sand

C—34 to 80 inches; yellowish brown, mottled sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: 10 to 16 inches to ortstein

Drainage class: Moderately well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: 2 feet (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5a-h

Habitat type: ATD

65B—Rubicon sand, organic surface, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the lower landscape positions

Typical Profile

Rubicon

Oe—0 to 4 inches; moderately decomposed plant material

E—4 to 7 inches; light brownish gray sand

Bs—7 to 32 inches; dark brown and strong brown sand

BC—32 to 40 inches; yellowish brown sand

C—40 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s
Michigan soil management group: 5.3a
Habitat type: AQVac

65D—Rubicon sand, organic surface, 6 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 100 percent

Typical Profile

Oe—0 to 4 inches; moderately decomposed plant material
 E—4 to 7 inches; light brownish gray sand
 Bs—7 to 32 inches; dark brown and strong brown sand
 BC—32 to 40 inches; yellowish brown sand
 C—40 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits
Slope: 6 to 15 percent
Hazard of soil blowing: Severe
Surface runoff class: Very low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.

- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: AQVac

65E—Rubicon sand, organic surface, 15 to 35 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Rubicon and similar soils: 100 percent

Typical Profile

Oe—0 to 4 inches; moderately decomposed plant material

E—4 to 7 inches; light brownish gray sand

Bs—7 to 32 inches; dark brown and strong brown sand

BC—32 to 40 inches; yellowish brown sand

C—40 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash and sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures.

Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.3a

Habitat type: AQVac

66B—Kalkaska-Kaks complex, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 65 percent

Kaks and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Kaks

A—0 to 4 inches; black sandy loam

Bhs—4 to 21 inches; dark brown and dark reddish brown cobbly loamy sand

BC—21 to 35 inches; strong brown gravelly loamy sand

C—35 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Kaks—sandy till

Slope: 0 to 6 percent

Hazard of soil blowing: Kalkaska—severe; Kaks—moderate

Surface runoff class: Kalkaska—negligible; Kaks—very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Kaks—well drained

Available water capacity: Low

Shrink-swell potential: Kalkaska—low; Kaks—moderate

Permeability: Kalkaska—rapid; Kaks—moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of these soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Kalkaska—4s; Kaks—3s

Michigan soil management group: Kalkaska—5a; Kaks—4a

Habitat type: Kalkaska—ATD; Kaks—AVO

66D—Kalkaska-Kaks complex, 6 to 15 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 65 percent

Kaks and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Kaks

A—0 to 4 inches; black sandy loam

Bhs—4 to 21 inches; dark brown and dark reddish brown cobbly loamy sand

BC—21 to 35 inches; strong brown gravelly loamy sand

C—35 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Kaks—sandy till

Slope: 6 to 15 percent

Hazard of soil blowing: Kalkaska—severe; Kaks—moderate

Surface runoff class: Kalkaska—very low; Kaks—low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Kaks—well drained

Available water capacity: Low

Shrink-swell potential: Kalkaska—low; Kaks—moderate

Permeability: Kalkaska—rapid; Kaks—moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of these soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Kalkaska—6s; Kaks—4e

Michigan soil management group: Kalkaska—5a; Kaks—4a

Habitat type: Kalkaska—ATD; Kaks—AVO

66E—Kalkaska-Kaks complex, 15 to 35 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 65 percent

Kaks and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in depressions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Kaks

A—0 to 4 inches; black sandy loam

Bhs—4 to 21 inches; dark brown and dark reddish brown cobbly loamy sand

BC—21 to 35 inches; strong brown gravelly loamy sand

C—35 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Kaks—sandy till

Slope: 15 to 35 percent

Hazard of soil blowing: Kalkaska—severe; Kaks—moderate

Surface runoff class: Kalkaska—low; Kaks—high

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Kaks—well drained

Available water capacity: Low

Shrink-swell potential: Kalkaska—low; Kaks—moderate

Permeability: Kalkaska—rapid; Kaks—moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Kalkaska—7s; Kaks—6e

Michigan soil management group: Kalkaska—5a; Kaks—4a

Habitat type: Kalkaska—ATD; Kaks—AVO

66F—Kalkaska-Kaks complex, 35 to 60 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 65 percent

Kaks and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in depressions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Kaks

A—0 to 4 inches; black sandy loam

Bhs—4 to 21 inches; dark brown and dark reddish brown cobbly loamy sand

BC—21 to 35 inches; strong brown gravelly loamy sand

C—35 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Kaks—sandy till

Slope: 35 to 60 percent

Hazard of soil blowing: Kalkaska—severe; Kaks—moderate

Surface runoff class: Kalkaska—low; Kaks—high

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Kaks—well drained

Available water capacity: Low

Shrink-swell potential: Kalkaska—low; Kaks—moderate

Permeability: Kalkaska—rapid; Kaks—moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Kalkaska—7s; Kaks—7e

Michigan soil management group: Kalkaska—5a; Kaks—4a

Habitat type: Kalkaska—ATD; Kaks—AVO

74B—Menominee, sandy substratum-Graeraet complex, 0 to 6 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Menominee and similar soils: 40 to 60 percent

Graeraet and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils

Typical Profile**Menominee**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown sand

Bhs—8 to 11 inches; dark reddish brown sand

Bs—11 to 34 inches; brown and strong brown sand

2B/E—34 to 46 inches; reddish brown clay loam and reddish gray fine sandy loam

2C—46 to 62 inches; reddish brown loam

3C—62 to 80 inches; stratified light reddish brown sand to reddish brown and yellowish red loamy sand

Graveraet

Oi—0 to 1 inch; slightly decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 7 inches; brown fine sandy loam

Bhs—7 to 10 inches; dark reddish brown fine sandy loam

Bs—10 to 17 inches; dark brown fine sandy loam

E/Bx—17 to 33 inches; mottled brown loamy sand and reddish loam

B/E—33 to 48 inches; reddish brown sandy clay loam and brown loamy sand

Bt—48 to 68 inches; reddish brown sandy clay loam

C—68 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Menominee—sandy outwash over loamy till; Graveraet—till

Slope: Menominee—2 to 6 percent; Graveraet—0 to 4 percent

Hazard of soil blowing: Menominee—severe; Graveraet—moderate

Surface runoff class: Menominee—negligible; Graveraet—medium

Potential for frost action: Menominee—low; Graveraet—moderate

Depth to restrictive feature: Menominee—more than 80 inches; Graveraet—14 to 24 inches to a fragipan

Drainage class: Menominee—well drained; Graveraet—moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Menominee—rapid in the upper part, moderate in the middle part, and rapid in the lower part; Graveraet—moderate in the upper part, slow in the middle part, and moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: Menominee—more than 6.5 feet; Graveraet—1 foot (April)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Menominee soil, logging roads should be stabilized.
- In areas of the Graveraet soil, the seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- In areas of the Graveraet soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Graveraet soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

- Filling or mounding with suitable material helps to raise the absorption field above the water table in areas of the Graveraet soil.

Interpretive Groups

Land capability classification: Menominee—3s; Graveraet—2e

Michigan soil management group: Menominee—4/2a; Graveraet—3a-f

Habitat type: AVO

75D—Dillingham-Kalkaska complex, 6 to 15 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Dillingham and similar soils: 40 to 60 percent

Kalkaska and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the major soils

Typical Profile

Dillingham

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown loamy sand

Bhs—8 to 11 inches; dark brown loamy sand

Bs—11 to 21 inches; dark brown loamy fine sand

E/Bx—21 to 31 inches; light reddish brown fine sand and reddish brown loamy fine sand

C—31 to 80 inches; reddish brown and pinkish gray sand

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Dillingham—sandy till; Kalkaska—sandy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Dillingham—moderate; Kalkaska—severe

Surface runoff class: Dillingham—medium; Kalkaska—very low

Potential for frost action: Low

Depth to restrictive feature: Dillingham—16 to 28 inches to a fragipan; Kalkaska—more than 80 inches

Drainage class: Dillingham—well drained; Kalkaska—somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Dillingham—moderately rapid in the upper part, slow in the middle part, and moderately rapid in the lower part; Kalkaska—rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Dillingham soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Kalkaska soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: Dillingham—4a; Kalkaska—5a

Habitat type: ATD

75E—Dillingham-Kalkaska complex, 15 to 35 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Dillingham and similar soils: 35 to 55 percent

Kalkaska and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 25 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in depressions
- The well drained Alcona soils in landscape positions similar to those of the major soils

Typical Profile

Dillingham

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown loamy sand

Bhs—8 to 11 inches; dark brown loamy sand

Bs—11 to 21 inches; dark brown loamy fine sand

E/Bx—21 to 31 inches; light reddish brown fine sand and reddish brown loamy fine sand

C—31 to 80 inches; reddish brown and pinkish gray sand

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Dillingham—sandy till; Kalkaska—sandy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Dillingham—moderate; Kalkaska—severe

Surface runoff class: Dillingham—high; Kalkaska—low

Potential for frost action: Low

Depth to restrictive feature: Dillingham—16 to 28 inches to a fragipan; Kalkaska—more than 80 inches

Drainage class: Dillingham—well drained; Kalkaska—somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Dillingham—moderately rapid in the upper part, slow in the middle part, and moderately rapid in the lower part; Kalkaska—rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.
- In areas of the Dillingham soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Dillingham—4a; Kalkaska—5a

Habitat type: ATD

75F—Dillingham-Kalkaska complex, 35 to 70 percent slopes

Setting

Landform: Disintegration moraines

Map Unit Composition

Dillingham and similar soils: 35 to 55 percent

Kalkaska and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 25 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in depressions
- The well drained Alcona soils in landscape positions similar to those of the major soils

Typical Profile

Dillingham

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown loamy sand

Bhs—8 to 11 inches; dark brown loamy sand

Bs—11 to 21 inches; dark brown loamy fine sand

E/Bx—21 to 31 inches; light reddish brown fine sand and reddish brown loamy fine sand

C—31 to 80 inches; reddish brown and pinkish gray sand

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Dillingham—sandy till; Kalkaska—sandy glaciofluvial deposits

Slope: 35 to 70 percent

Hazard of soil blowing: Dillingham—moderate; Kalkaska—severe

Surface runoff class: Dillingham—high; Kalkaska—low

Potential for frost action: Low

Depth to restrictive feature: Dillingham—16 to 28 inches to a fragipan; Kalkaska—more than 80 inches

Drainage class: Dillingham—well drained; Kalkaska—somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Dillingham—moderately rapid in the upper part, slow in the middle part, and moderately rapid in the lower part; Kalkaska—rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.
- In areas of the Dillingham soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Dillingham—4a; Kalkaska—5a

Habitat type: ATD

76D—Menominee, sandy substratum-Trenary complex, 6 to 15 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Menominee and similar soils: 40 to 60 percent

Trenary and similar soils: 30 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Solona soils in the slightly lower landscape positions

Typical Profile

Menominee

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown sand

Bhs—8 to 11 inches; dark reddish brown sand

Bs—11 to 34 inches; brown and strong brown sand
 2B/E—34 to 46 inches; reddish brown clay loam and reddish gray fine sandy loam
 2C—46 to 62 inches; reddish brown loam
 3C—62 to 80 inches; stratified light reddish brown sand to reddish brown and yellowish red loamy sand

Trenary

A—0 to 2 inches; very dark gray fine sandy loam
 E—2 to 6 inches; brown fine sandy loam
 Bhs—6 to 12 inches; dark reddish brown fine sandy loam
 Bs—12 to 17 inches; reddish brown fine sandy loam
 E'—17 to 26 inches; reddish brown sandy loam
 Bt—26 to 37 inches; dark reddish brown sandy clay loam
 C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Menominee—sandy outwash over loamy till; Trenary—loamy till

Slope: 6 to 15 percent

Hazard of soil blowing: Menominee—severe; Trenary—moderate

Surface runoff class: Menominee—low; Trenary—medium

Potential for frost action: Menominee—low; Trenary—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Menominee—rapid in the upper part, moderate in the middle part, and rapid in the lower part; Trenary—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Menominee soil, logging roads should be stabilized.
- In areas of the Trenary soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the Menominee soil, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: Menominee—4s; Trenary—4e

Michigan soil management group: Menominee—4/2a; Trenary—3a
Habitat type: AVO

76E—Menominee, sandy substratum-Trenary complex, 15 to 35 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Menominee and similar soils: 40 to 60 percent

Trenary and similar soils: 30 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Solona soils in the slightly lower landscape positions

Typical Profile

Menominee

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 8 inches; brown sand

Bhs—8 to 11 inches; dark reddish brown sand

Bs—11 to 34 inches; brown and strong brown sand

2B/E—34 to 46 inches; reddish brown clay loam and reddish gray fine sandy loam

2C—46 to 62 inches; reddish brown loam

3C—62 to 80 inches; stratified light reddish brown sand to reddish brown and yellowish red loamy sand

Trenary

A—0 to 2 inches; very dark gray fine sandy loam

E—2 to 6 inches; brown fine sandy loam

Bhs—6 to 12 inches; dark reddish brown fine sandy loam

Bs—12 to 17 inches; reddish brown fine sandy loam

E'—17 to 26 inches; reddish brown sandy loam

Bt—26 to 37 inches; dark reddish brown sandy clay loam

C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Menominee—sandy outwash over loamy till; Trenary—loamy till

Slope: 15 to 35 percent

Hazard of soil blowing: Menominee—severe; Trenary—moderate

Surface runoff class: Menominee—medium; Trenary—high

Potential for frost action: Menominee—low; Trenary—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Menominee—rapid in the upper part, moderate in the middle part, and rapid in the lower part; Trenary—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Menominee soil, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: Menominee—4/2a; Trenary—3a

Habitat type: AVO

84B—Liminga-Alcona complex, 0 to 6 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Liminga and similar soils: 40 to 60 percent

Alcona and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in drainageways
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile

Liminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Alcona

O_e—0 to 1 inch; moderately decomposed plant material

E—1 to 3 inches; pinkish gray fine sandy loam

B_s—3 to 17 inches; dark brown fine sandy loam

B/E—17 to 23 inches; dark yellowish brown very fine sandy loam

E/B—23 to 54 inches; light yellowish brown loamy fine sand and reddish brown fine sandy loam

C—54 to 80 inches; light brown, stratified loamy very fine sand to fine sandy loam to very fine sandy loam

Soil Properties and Qualities

Parent material: Liminga—sandy glaciofluvial deposits; Alcona—loamy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Liminga—severe; Alcona—moderate

Surface runoff class: Liminga—negligible; Alcona—low

Potential for frost action: Liminga—low; Alcona—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Liminga—low; Alcona—high

Shrink-swell potential: Low

Permeability: Liminga—rapid; Alcona—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Liminga soil, logging roads should be stabilized.
- In areas of the Alcona soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of the Liminga soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Liminga—3s; Alcona—2e

Michigan soil management group: Liminga—5a; Alcona—3a

Habitat type: Liminga—ATD; Alcona—AVO

84D—Liminga-Alcona complex, 6 to 15 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Liminga and similar soils: 40 to 60 percent

Alcona and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in drainageways
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile

Liminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Alcona

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 3 inches; pinkish gray fine sandy loam

Bs—3 to 17 inches; dark brown fine sandy loam

B/E—17 to 23 inches; dark yellowish brown very fine sandy loam

E/B—23 to 54 inches; light yellowish brown loamy fine sand and reddish brown fine sandy loam

C—54 to 80 inches; light brown, stratified loamy very fine sand to fine sandy loam to very fine sandy loam

Soil Properties and Qualities

Parent material: Liminga—sandy glaciofluvial deposits; Alcona—loamy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Liminga—severe; Alcona—moderate

Surface runoff class: Liminga—very low; Alcona—medium

Potential for frost action: Liminga—low; Alcona—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Liminga—low; Alcona—high

Shrink-swell potential: Low

Permeability: Liminga—rapid; Alcona—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Liminga soil, logging roads should be stabilized.

- In areas of the Alcona soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Liminga soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Liminga—3s; Alcona—3e

Michigan soil management group: Liminga—5a; Alcona—3a

Habitat type: Liminga—ATD; Alcona—AVO

84E—Limminga-Alcona complex, 15 to 35 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Limminga and similar soils: 40 to 60 percent

Alcona and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Limminga

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 7 inches; brown fine sand

Bhs—7 to 9 inches; dark brown fine sand

Bs—9 to 22 inches; strong brown fine sand

BC—22 to 31 inches; brownish yellow fine sand

C—31 to 80 inches; brownish yellow fine sand

Alcona

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 3 inches; pinkish gray fine sandy loam

Bs—3 to 17 inches; dark brown fine sandy loam

B/E—17 to 23 inches; dark yellowish brown very fine sandy loam

E/B—23 to 54 inches; light yellowish brown loamy fine sand and reddish brown fine sandy loam

C—54 to 80 inches; light brown, stratified loamy very fine sand to fine sandy loam to very fine sandy loam

Soil Properties and Qualities

Parent material: Liminga—sandy glaciofluvial deposits; Alcona—loamy glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Liminga—severe; Alcona—moderate

Surface runoff class: Liminga—low; Alcona—high

Potential for frost action: Liminga—low; Alcona—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Liminga—low; Alcona—high

Shrink-swell potential: Low

Permeability: Liminga—rapid; Alcona—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Liminga soil, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Liminga—6s; Alcona—6e

Michigan soil management group: Liminga—5a; Alcona—3e

Habitat type: Liminga—ATD; Alcona—AVO

85B—Kalkaska-Okeefe sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains and disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 60 percent

Okeefe and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the major soils
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile**Kalkaska**

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Okeefe

Oe—0 to 2 inches; black, moderately decomposed plant material

E—2 to 6 inches; brown sand

Bhs—6 to 7 inches; dark brown sand

Bs—7 to 19 inches; brown and strong brown sand

BC—19 to 31 inches; yellowish brown fine sand

2C—31 to 80 inches; stratified brown silt loam and pale brown silt

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Okeefe—sandy outwash over loamy glaciolacustrine deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Okeefe—well drained

Available water capacity: Kalkaska—low; Okeefe—moderate

Shrink-swell potential: Low

Permeability: Kalkaska—rapid; Okeefe—rapid in the upper part and moderate in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of these soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Kalkaska—4s; Okeefe—3s
Michigan soil management group: Kalkaska—5a; Okeefe—4/2a
Habitat type: ATD

85D—Kalkaska-Okeefe sands, 6 to 15 percent slopes

Setting

Landform: Outwash plains and disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 60 percent
 Okeefe and similar soils: 30 to 50 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the major soils
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand
 E—2 to 6 inches; brown sand
 Bhs—6 to 8 inches; dark reddish brown sand
 Bs—8 to 16 inches; strong brown sand
 BC—16 to 26 inches; strong brown sand
 C—26 to 80 inches; light yellowish brown and pale brown sand

Okeefe

Oe—0 to 2 inches; black, moderately decomposed plant material
 E—2 to 6 inches; brown sand
 Bhs—6 to 7 inches; dark brown sand
 Bs—7 to 19 inches; brown and strong brown sand
 BC—19 to 31 inches; yellowish brown fine sand
 2C—31 to 80 inches; stratified brown silt loam and pale brown silt

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Okeefe—sandy outwash over loamy glaciolacustrine deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Kalkaska—very low; Okeefe—low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Okeefe—well drained

Available water capacity: Kalkaska—low; Okeefe—moderate

Shrink-swell potential: Low

Permeability: Kalkaska—rapid; Okeefe—rapid in the upper part and moderate in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of these soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Kalkaska—6s; Okeefe—4e

Michigan soil management group: Kalkaska—5a; Okeefe—4/2a

Habitat type: ATD

85E—Kalkaska-Okeefe sands, 15 to 35 percent slopes

Setting

Landform: Outwash plains and disintegration moraines

Map Unit Composition

Kalkaska and similar soils: 40 to 60 percent

Okeefe and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Alcona soils in landscape positions similar to those of the major soils
- The moderately well drained Paquin soils in the slightly lower landscape positions

Typical Profile

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Okeefe

Oe—0 to 2 inches; black, moderately decomposed plant material

E—2 to 6 inches; brown sand

Bhs—6 to 7 inches; dark brown sand

Bs—7 to 19 inches; brown and strong brown sand

BC—19 to 31 inches; yellowish brown fine sand
 2C—31 to 80 inches; stratified brown silt loam and pale brown silt

Soil Properties and Qualities

Parent material: Kalkaska—sandy glaciofluvial deposits; Okeefe—sandy outwash over loamy glaciolacustrine deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Kalkaska—somewhat excessively drained; Okeefe—well drained

Available water capacity: Kalkaska—low; Okeefe—moderate

Shrink-swell potential: Low

Permeability: Kalkaska—rapid; Okeefe—rapid in the upper part and moderate in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Kalkaska—7s; Okeefe—6e

Michigan soil management group: Kalkaska—5a; Okeefe—4/2a

Habitat type: ATD

88B—Croswell-Au Gres sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Croswell and similar soils 40 to 55 percent

Au Gres and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions

Typical Profile

Croswell

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; light brownish gray sand

Bs—6 to 15 inches; dark brown and strong brown sand

BC—15 to 22 inches; brownish yellow sand

C—22 to 80 inches; light yellowish brown, mottled sand

Au Gres

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; light brownish gray sand

Bs—7 to 17 inches; strong brown and dark brown, mottled sand

BC—17 to 28 inches; brown, mottled sand

C—28 to 80 inches; light yellowish brown and pale brown, mottled sand

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits

Slope: Croswell—0 to 6 percent; Au Gres—0 to 3 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Croswell—low; Au Gres—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Croswell—moderately well drained; Au Gres—somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: Croswell—2 feet (April, May); Au Gres—0.5 foot (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- In areas of the Au Gres soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

- The seasonal high water table in areas of the Au Gres soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate in areas of the Au Gres soil.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The poor filtering capacity of these soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: Croswell—4s; Au Gres—4w

Michigan soil management group: Croswell—5a; Au Gres—5b

Habitat type: Croswell—AQVac; Au Gres—TMC-Vac

89A—Spot-Finch complex, 0 to 3 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Spot and similar soils: 40 to 60 percent

Finch and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The moderately well drained Paquin soils in the slightly higher landscape positions

Typical Profile

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Finch

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 11 inches; pinkish gray sand

Bsm—11 to 42 inches; dark brown, brown, and dark reddish brown, mottled sand

C—42 to 80 inches; yellowish brown fine sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Spot—0 to 2 percent; Finch—0 to 3 percent

Hazard of soil blowing: Spot—slight; Finch—severe

Surface runoff class: Spot—negligible; Finch—very low

Potential for frost action: Spot—moderate; Finch—low

Depth to restrictive feature: Spot—8 to 12 inches to ortstein; Finch—7 to 13 inches to ortstein

Drainage class: Spot—poorly drained; Finch—somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Spot—at the surface (January, February, March, April, May, October, November, December); Finch—0.5 to 6.7 feet (April, May)

Deepest ponding: Spot—0.2 foot (March, April, May, October, November); Finch—none

Months in which ponding does not occur: Spot—January, February, June, July, August, September, December; Finch—all year

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year, especially in areas of the Spot soil.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- The Spot soil is generally unsuited to building site development because of the ponding.
- In areas of the Finch soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.
- The poor filtering capacity of the Finch soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Filling or mounding with suitable material helps to raise the absorption field above the water table in areas of the Finch soil.

Interpretive Groups

Land capability classification: Spot—5w; Finch—4w

Michigan soil management group: Spot—5c-h; Finch—5b-h

Habitat type: Spot—TTS; Finch—TMC-Vac

90D—Rousseau-Spot complex, 0 to 15 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in landscape positions slightly higher than those of the Spot soil

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Spot—sandy outwash

Slope: Rousseau—2 to 15 percent; Spot—0 to 2 percent

Hazard of soil blowing: Rousseau—severe; Spot—slight

Surface runoff class: Rousseau—very low; Spot—negligible

Potential for frost action: Rousseau—low; Spot—moderate

Depth to restrictive feature: Rousseau—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Rousseau—excessively drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Rousseau—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Rousseau—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Rousseau soil, logging roads should be stabilized.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Rousseau soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- The Spot soil is generally unsuited to building site development because of ponding.

Septic tank absorption fields

- In area of the Rousseau soil, land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Rousseau soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Rousseau—4e; Spot—5w

Michigan soil management group: Rousseau—5a; Spot—5c-h

Habitat type: Rousseau—AQVac; Spot—TTS

90E—Rousseau-Spot complex, 0 to 35 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in landscape positions slightly higher than those of the Spot soil

Typical Profile**Rousseau**

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Spot—sandy outwash

Slope: Rousseau—2 to 35 percent; Spot—0 to 2 percent

Hazard of soil blowing: Rousseau—severe; Spot—slight

Surface runoff class: Rousseau—low; Spot—negligible

Potential for frost action: Rousseau—low; Spot—moderate

Depth to restrictive feature: Rousseau—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Rousseau—excessively drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Rousseau—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Rousseau—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Rousseau soil, logging roads should be stabilized.
- Because of the slope in areas of the Rousseau soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.

- Because of the erosion hazard in areas of the Rousseau soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Rousseau soil, and the ponding is a concern in areas of the Spot soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Rousseau soil, and the ponding is a concern in areas of the Spot soil.

Interpretive Groups

Land capability classification: Rousseau—6e; Spot—5w

Michigan soil management group: Rousseau—5a; Spot—5c-h

Habitat type: Rousseau—AQVac; Spot—TTS

90F—Rousseau-Spot complex, 0 to 60 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in landscape positions slightly higher than those of the Spot soil

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Spot—sandy outwash

Slope: Rousseau—2 to 60 percent; Spot—0 to 2 percent

Hazard of soil blowing: Rousseau—severe; Spot—slight

Surface runoff class: Rousseau—low; Spot—negligible

Potential for frost action: Rousseau—low; Spot—moderate

Depth to restrictive feature: Rousseau—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Rousseau—excessively drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Rousseau—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Rousseau—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope in areas of the Rousseau soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard in areas of the Rousseau soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Rousseau soil, and the ponding is a concern in areas of the Spot soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Rousseau soil, and the ponding is a concern in areas of the Spot soil.

Interpretive Groups

Land capability classification: Rousseau—7e; Spot—5w

Michigan soil management group: Rousseau—5a; Spot—5c-h

Habitat type: Rousseau—AQVac; Spot—TTS

91D—Rousseau fine sand, 6 to 15 percent slopes***Setting***

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions
- The somewhat poorly drained Wainola soils in the lower landscape positions

Typical Profile**Rousseau**

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 5a

Habitat type: AQVac

91E—Rousseau fine sand, 15 to 35 percent slopes***Setting***

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions
- The somewhat poorly drained Wainola soils in the lower landscape positions

Typical Profile**Rousseau**

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: 5a

Habitat type: AQVac

91F—Rousseau fine sand, 35 to 60 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Kinross soils in depressions

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Parent material: Eolian sands
Slope: 35 to 60 percent
Hazard of soil blowing: Severe
Surface runoff class: Low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e
Michigan soil management group: 5a
Habitat type: AQVac

93F—Ontonagon-Pickford, occasionally flooded, complex, 0 to 50 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Ontonagon and similar soils: 60 to 85 percent
 Pickford and similar soils: 15 to 30 percent
 Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Rudyard soils in landscape positions slightly higher than those of the Pickford soil

Typical Profile**Ontonagon**

A—0 to 7 inches; dark brown silt loam
 B/E—7 to 13 inches; reddish brown silty clay and brown silt loam
 Bt—13 to 21 inches; reddish brown clay
 BC—21 to 32 inches; reddish brown clay
 C—32 to 80 inches; reddish brown clay

Pickford

A—0 to 6 inches; black silt loam
 Eg—6 to 9 inches; gray silt loam
 Bw—9 to 13 inches; reddish brown silty clay loam
 BC—13 to 24 inches; reddish brown clay
 C—24 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Clayey glaciolacustrine deposits

Slope: Ontonagon—2 to 50 percent; Pickford—0 to 2 percent

Hazard of soil blowing: Ontonagon—slight; Pickford—negligible

Surface runoff class: Ontonagon—very high; Pickford—high

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Ontonagon—well drained; Pickford—poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Very slow

Frequency of flooding: Ontonagon—none; Pickford—occasional (March, April, October)

Depth to seasonal high water table: Ontonagon—more than 6.5 feet; Pickford—at the surface (March, April, May, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil in these soils, logging roads should be graveled and in some areas landings should be stabilized.
- In areas of the Ontonagon soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Because of the slope in areas of the Ontonagon soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard in areas of the Ontonagon soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced and by using such harvest methods as selective cutting and strip cutting.
- The seasonal high water table in areas of the Pickford soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Pickford soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Pickford soil because of wetness, seedling mortality, and plant competition.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Ontonagon soil, and flooding is a concern in areas of the Pickford soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Ontonagon soil, and flooding is a concern in areas of the Pickford soil.

Interpretive Groups

Land capability classification: Ontonagon—7e; Pickford—5w

Michigan soil management group: Ontonagon—0a; Pickford—1c

Habitat type: Ontonagon—ATD; Pickford—TTP

94A—Tawas-Spot-Finch complex, 0 to 3 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Tawas and similar soils: 30 to 50 percent

Spot and similar soils: 25 to 45 percent

Finch and similar soils: 15 to 30 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The moderately well drained Paquin soils in the slightly higher landscape positions

Typical Profile

Tawas

Oa—0 to 26 inches; black muck

2C—26 to 80 inches; dark brown and light brownish gray sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Finch

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 11 inches; pinkish gray sand

Bsm—11 to 42 inches; dark brown, brown, and dark reddish brown, mottled sand

C—42 to 80 inches; yellowish brown fine sand

Soil Properties and Qualities

Parent material: Tawas—organic, woody material over drift; Spot and Finch—outwash

Slope: Tawas—0 to 1 percent; Spot—0 to 2 percent; Finch—0 to 3 percent

Hazard of soil blowing: Tawas and Spot—slight; Finch—severe

Surface runoff class: Tawas and Spot—negligible; Finch—very low

Potential for frost action: Tawas—high; Spot—moderate; Finch—low

Depth to restrictive feature: Tawas—more than 80 inches; Spot—8 to 12 inches to ortstein; Finch—7 to 13 inches to ortstein

Drainage class: Tawas—very poorly drained; Spot—poorly drained; Finch—somewhat poorly drained

Available water capacity: Tawas—very high; Spot and Finch—low

Shrink-swell potential: Low

Permeability: Tawas—moderate in the upper part and rapid in the lower part; Spot and Finch—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Tawas—at the surface (January, February, March, April, May, June, October, November, December); Spot—at the surface (January, February, March, April, May, October, November, December); Finch—0.5 foot to 6.7 feet (April, May)

Deepest ponding: Tawas—0.2 foot (March, April, May, June, October, November); Spot—0.2 foot (March, April, May, October); Finch—none

Months in which ponding does not occur: Tawas—January, February, July, August, September, December; Spot—January, February, June, July, August, September, December; Finch—all year

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because of wetness and low strength, special harvesting equipment is needed in areas of the Tawas soil. The equipment can be used only during periods in winter when skid roads and access roads are frozen.
- Because of low strength in areas of the Tawas soil, suitable surfacing material is needed on year-round roads and landings.
- In areas of the Spot and Finch soils, the seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel, especially in areas of the Spot soil. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted in areas of the Tawas and Spot soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- The Tawas and Spot soils are generally unsuited to building site development because of the ponding.

- In areas of the Finch soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The Tawas soil is generally unsuited to use as a site for septic tank absorption fields because of low strength and ponding.
- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.
- The poor filtering capacity of the Finch soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution in areas of the Finch soil.
- Filling or mounding with suitable material helps to raise the absorption field above the water table in areas of the Finch soil.

Interpretive Groups

Land capability classification: Tawas—8w; Spot—5w; Finch—4w

Michigan soil management group: Tawas—M/4c; Spot—5c-h; Finch—5b-h

Habitat type: Tawas—TTS; Spot—TTS; Finch—TMC-Vac

102—Spot-Dawson peats

Setting

Landform: Ground moraines, outwash plains, and lake plains

Map Unit Composition

Spot and similar soils: 45 to 60 percent

Dawson and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Crowell and somewhat poorly drained Finch soils in the higher landscape positions

Typical Profile

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Dawson

Oi—0 to 10 inches; reddish brown peat

Oe—10 to 19 inches; very dark gray mucky peat

Oa—19 to 38 inches; black muck

C—38 to 80 inches; dark brown, mottled fine sand

Soil Properties and Qualities

Parent material: Spot—sandy glaciofluvial deposits; Dawson—organic, herbaceous material over sandy glaciofluvial deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: Spot—moderate; Dawson—high

Depth to restrictive feature: Spot—8 to 12 inches to ortstein; Dawson—more than 80 inches

Drainage class: Spot—poorly drained; Dawson—very poorly drained

Available water capacity: Spot—low; Dawson—very high

Shrink-swell potential: Low

Permeability: Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part; Dawson—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Spot—at the surface (January, February, March, April, May, October, November, December); Dawson—at the surface (January, February, March, April, May, June, September, October, November, December)

Deepest ponding: Spot—0.2 foot (March, April, May, October, November); Dawson—0.5 foot (April, May)

Months in which ponding does not occur: Spot—January, February, June, July, August, September, December; Dawson—July, August, September

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- In areas of the Spot soil, the seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Opportunities for logging are limited in areas of the Dawson soil because this soil supports very few trees. Low strength also limits logging activities.
- Because of low strength in areas of the Dawson soil, suitable surfacing material is needed on year-round roads and landings.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted in areas of these soils.

Building site development

- Because of ponding, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, these soils are generally unsuited to use as sites for septic tank absorption fields. Low strength is an additional concern in areas of the Dawson soil.

Interpretive Groups

Land capability classification: Spot—5w; Dawson—8w

Michigan soil management group: Spot—5c-h; Dawson—M/4c-a

Habitat type: Spot—TTS; Dawson—PCS

104B—Pence very fine sandy loam, 0 to 6 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kaskaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 5 inches; reddish gray very fine sandy loam

Bhs—5 to 6 inches; dark reddish brown very fine sandy loam

Bs1—6 to 13 inches; dark reddish brown very fine sandy loam

Bs2—13 to 20 inches; brown fine sandy loam

2BC—20 to 27 inches; brown sand

2C—27 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 2e

Michigan soil management group: 3/5a-a

Habitat type: ATD

104D—Pence very fine sandy loam, 6 to 15 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 5 inches; reddish gray very fine sandy loam

Bhs—5 to 6 inches; dark reddish brown very fine sandy loam

Bs1—6 to 13 inches; dark reddish brown very fine sandy loam

Bs2—13 to 20 inches; brown fine sandy loam

2BC—20 to 27 inches; brown sand

2C—27 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Outwash

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 3/5a-a

Habitat type: ATD

104E—Pence very fine sandy loam, 15 to 35 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 5 inches; reddish gray very fine sandy loam

Bhs—5 to 6 inches; dark reddish brown very fine sandy loam

Bs1—6 to 13 inches; dark reddish brown very fine sandy loam

Bs2—13 to 20 inches; brown fine sandy loam

2BC—20 to 27 inches; brown sand

2C—27 to 80 inches; pale brown sand

Soil Properties and Qualities

Parent material: Outwash

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: 3/5a-a

Habitat type: ATD

109D—Rousseau-Dawson complex, 0 to 15 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Dawson and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in drainageways

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Dawson

Oi—0 to 10 inches; reddish brown peat

Oe—10 to 19 inches; very dark gray mucky peat

Oa—19 to 38 inches; black muck
 C—38 to 80 inches; dark brown, mottled fine sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Dawson—organic, herbaceous material over sandy glaciofluvial deposits
Slope: Rousseau—2 to 15 percent; Dawson—0 to 2 percent
Hazard of soil blowing: Rousseau—severe; Dawson—slight
Surface runoff class: Rousseau—low; Dawson—negligible
Potential for frost action: Rousseau—low; Dawson—high
Depth to restrictive feature: More than 80 inches
Drainage class: Rousseau—excessively drained; Dawson—very poorly drained
Available water capacity: Rousseau—low; Dawson—very high
Shrink-swell potential: Low
Permeability: Rousseau—rapid; Dawson—moderate in the upper part and rapid in the lower part
Flooding: None
Depth to seasonal high water table: Rousseau—more than 6.5 feet; Dawson—at the surface (January, February, March, April, May, June, September, October, November, December)
Deepest ponding: Rousseau—none; Dawson—0.5 foot (April, May)
Months in which ponding does not occur: Rousseau—all year; Dawson—July, August, September

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Rousseau soil, logging roads should be stabilized.
- Opportunities for logging are limited because these soils support very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of these soils to winter, when roads may be frozen.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted in areas of the Dawson soil.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Rousseau soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- The Dawson soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope in areas of the Rousseau soil.
- The poor filtering capacity of the Rousseau soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- The Dawson soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding and low strength.

Interpretive Groups

Land capability classification: Rousseau—4e; Dawson—8w

Michigan soil management group: Rousseau—5a; Dawson—M/4c-a

Habitat type: Rousseau—AQVac; Dawson—PCS

109F—Rousseau-Dawson complex, 0 to 60 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Dawson and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in drainageways

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Dawson

Oi—0 to 10 inches; reddish brown peat

Oe—10 to 19 inches; very dark gray mucky peat

Oa—19 to 38 inches; black muck

C—38 to 80 inches; dark brown, mottled fine sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Dawson—organic, herbaceous material over sandy glaciofluvial deposits

Slope: Rousseau—2 to 60 percent; Dawson—0 to 2 percent

Hazard of soil blowing: Rousseau—severe; Dawson—slight

Surface runoff class: Rousseau—low; Dawson—negligible

Potential for frost action: Rousseau—low; Dawson—high

Depth to restrictive feature: More than 80 inches

Drainage class: Rousseau—excessively drained; Dawson—very poorly drained

Available water capacity: Rousseau—low; Dawson—high

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Dawson—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Dawson—at the surface (January, February, March, April, May, June, September, October, November, December)

Deepest ponding: Rousseau—none; Dawson—0.5 foot (April, May)

Months in which ponding does not occur: Rousseau—all year; Dawson—July, August, September

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment on the Rousseau soil, logging roads should be stabilized.
- Because of the slope in areas of the Rousseau soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard in areas of the Rousseau soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.
- In areas of the Dawson soil, opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of these soils to winter, when roads may be frozen.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on the Dawson soil.
- In areas of the Dawson soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because of wetness and low strength in areas of the Dawson soil, special harvesting equipment is needed. The equipment can be used only during periods in winter when skid roads and access roads are frozen.
- Because of low strength in areas of the Dawson soil, suitable surfacing material is needed on year-round roads and landings.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Rousseau soil, and ponding is a concern in areas of the Dawson soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Rousseau soil, and ponding is a concern in areas of the Dawson soil.

Interpretive Groups

Land capability classification: Rousseau—7e; Dawson—8w

Michigan soil management group: Rousseau—5a; Dawson—M/4c-a

Habitat type: Rousseau—AQVac; Dawson—PCS

110D—Au Gres-Dawson-Rubicon complex, 0 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Au Gres and similar soils: 40 to 60 percent

Dawson and similar soils: 30 to 40 percent

Rubicon and similar soils: 10 to 25 percent

Typical Profile

Au Gres

Oe—0 to 2 inches; moderately decomposed plant material
 E—2 to 7 inches; light brownish gray sand
 Bs—7 to 17 inches; strong brown and dark brown, mottled sand
 BC—17 to 28 inches; brown, mottled sand
 C—28 to 80 inches; light yellowish brown and pale brown, mottled sand

Dawson

Oi—0 to 10 inches; reddish brown peat
 Oe—10 to 19 inches; very dark gray mucky peat
 Oa—19 to 38 inches; black muck
 C—38 to 80 inches; dark brown, mottled fine sand

Rubicon

Oi—0 to 2 inches; slightly decomposed plant material
 E—2 to 5 inches; light brownish gray sand
 Bs—5 to 30 inches; dark brown and strong brown sand
 BC—30 to 38 inches; yellowish brown sand
 C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Au Gres and Rubicon—sandy glaciofluvial deposits; Dawson—organic, herbaceous material over sandy glaciofluvial deposits;
Slope: Au Gres—0 to 3 percent; Dawson—0 to 2 percent; Rubicon—2 to 15 percent
Hazard of soil blowing: Au Gres—severe; Dawson—slight; Rubicon—severe
Surface runoff class: Au Gres and Dawson—negligible; Rubicon—very low
Potential for frost action: Au Gres—moderate; Dawson—high; Rubicon—low
Depth to restrictive feature: More than 80 inches
Drainage class: Au Gres—somewhat poorly drained; Dawson—very poorly drained; Rubicon—excessively drained
Available water capacity: Au Gres and Rubicon—low; Dawson—very high
Shrink-swell potential: Low
Permeability: Au Gres and Rubicon—rapid; Dawson—moderate in the upper part and rapid in the lower part
Flooding: None
Depth to seasonal high water table: Au Gres—0.5 foot (April, May); Dawson—at the surface (January, February, March, April, May, June, September, October, November, December); Rubicon—more than 6.5 feet
Deepest ponding: Au Gres and Rubicon—none; Dawson—0.5 foot (April, May)
Months in which ponding does not occur: Au Gres and Rubicon—all year; Dawson—July, August, September

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Au Gres soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in areas of the Au Gres soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

- In areas of the Dawson soil, opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of these soils to winter, when roads may be frozen.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Rubicon soil, logging roads should be stabilized.
- Trees are generally not planted in areas of the Dawson soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Au Gres soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- In areas of the Rubicon soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- The Dawson soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- The poor filtering capacity of the Au Gres and Rubicon soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- In areas of the Au Gres soil, filling or mounding with suitable material helps to raise the absorption field above the water table.
- The Dawson soil is generally unsuited to use as a site for septic tank absorption fields because of ponding and low strength.
- Land shaping and installing the distribution lines on the contour help to overcome the slope in areas of the Rubicon soil.

Interpretive Groups

Land capability classification: Au Gres—4w; Dawson—8w; Rubicon—7s

Michigan soil management group: Au Gres—5b; Dawson—M/4c-a; Rubicon—5.3a

Habitat type: Au Gres—TMC-Vac; Dawson—PCS; Rubicon—AQVac

110E—Au Gres-Dawson-Rubicon complex, 0 to 35 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Au Gres and similar soils: 40 to 60 percent

Dawson and similar soils: 30 to 40 percent

Rubicon and similar soils: 10 to 25 percent

Typical Profile

Au Gres

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; light brownish gray sand

Bs—7 to 17 inches; strong brown and dark brown, mottled sand

BC—17 to 28 inches; brown, mottled sand

C—28 to 80 inches; light yellowish brown and pale brown, mottled sand

Dawson

Oi—0 to 10 inches; reddish brown peat

Oe—10 to 19 inches; very dark gray mucky peat

Oa—19 to 38 inches; black muck

C—38 to 80 inches; dark brown, mottled fine sand

Rubicon

Oi—0 to 2 inches; slightly decomposed plant material

E—2 to 5 inches; light brownish gray sand

Bs—5 to 30 inches; dark brown and strong brown sand

BC—30 to 38 inches; yellowish brown sand

C—38 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Au Gres and Rubicon—sandy glaciofluvial deposits; Dawson—organic, herbaceous material over sandy glaciofluvial deposits

Slope: Au Gres—0 to 3 percent; Dawson—0 to 2 percent; Rubicon—2 to 35 percent

Hazard of soil blowing: Au Gres—severe; Dawson—slight; Rubicon—severe

Surface runoff class: Au Gres and Dawson—negligible; Rubicon—very low

Potential for frost action: Au Gres—moderate; Dawson—high; Rubicon—low

Depth to restrictive feature: More than 80 inches

Drainage class: Au Gres—somewhat poorly drained; Dawson—very poorly drained; Rubicon—excessively drained

Available water capacity: Au Gres and Rubicon—low; Dawson—very high

Shrink-swell potential: Low

Permeability: Au Gres and Rubicon—rapid; Dawson—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Au Gres—0.5 foot (April, May); Dawson—at the surface (January, February, March, April, May, June, September, October, November, December); Rubicon—more than 6.5 feet

Deepest ponding: Au Gres and Rubicon—none; Dawson—0.5 foot (April, May)

Months in which ponding does not occur: Au Gres and Rubicon—all year; Dawson—July, August, September

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Au Gres soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in areas of the Au Gres soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Dawson soil, opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of these soils to winter, when roads may be frozen.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Rubicon soil, logging roads should be stabilized.
- Because of the slope in areas of the Rubicon soil, special care is needed in laying out logging roads and landings and in operating logging equipment.
- Logging roads should be designed so that they conform to the topography.

- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard in areas of the Rubicon soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Trees are generally not planted in areas of the Dawson soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Au Gres soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Dawson soil is generally unsuited to building site development because of the ponding.
- The Rubicon soil is generally unsuited to building site development because of the slope.

Septic tank absorption fields

- The poor filtering capacity of the Au Gres and Rubicon soils can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- In areas of the Au Gres soil, filling or mounding with suitable material helps to raise the absorption field above the water table.
- The Dawson soil is generally unsuited to use as a site for septic tank absorption fields because of low strength and ponding.
- The Rubicon soil is generally unsuited to use as a site for septic tank absorption fields because of the slope.

Interpretive Groups

Land capability classification: Au Gres—4w; Dawson—8w; Rubicon—7s

Michigan soil management group: Au Gres—5b; Dawson—M/4c-a; Rubicon—5.3a

Habitat type: Au Gres—TMC-Vac; Dawson—PCS; Rubicon—AQVac

116—Udipsamments and Udorthents, nearly level

Map Unit Composition

Udipsamments: 0 to 100 percent

Udorthents: 0 to 100 percent

Soil Properties and Qualities

Udipsamments

- Udipsamments consist of sandy areas where the surface layer and parts of the subsoil have been removed or disturbed. In some areas the original soil has been covered with sandy fill material. Most areas are barren or are only sparsely vegetated.

Udorthents

- Udorthents consist of areas where topsoil has been removed and the subsoil or substratum is exposed. The exposed areas support little or no vegetation. Some inactive areas have a sparse cover of grass.

Use and Management

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

Interpretive Groups

Land capability classification: None assigned

Michigan soil management group: None assigned

Habitat type: None assigned

117D—Manistee sand, sandy substratum, 6 to 15 percent slopes***Setting***

Landform: Lake plains and outwash plains

Map Unit Composition

Manistee and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Allendale soils in the slightly lower landscape positions

Typical Profile**Manistee**

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 10 inches; pinkish gray sand

Bs—10 to 25 inches; dark brown and strong brown sand

2B/E—25 to 30 inches; reddish brown clay and pinkish gray silty clay loam

2Bt—30 to 36 inches; reddish brown clay

2C—36 to 64 inches; reddish brown clay

3C—64 to 80 inches; brown loamy sand

Soil Properties and Qualities

Parent material: Sandy outwash over clayey lacustrine deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Medium

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Rapid in the upper part and very slow in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 4/1a

Habitat type: ATD

120B—McMillan-Trenary fine sandy loams, 1 to 6 percent slopes***Setting***

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 45 to 65 percent

Trenary and similar soils: 25 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Solona soils in the slightly lower landscape positions

Typical Profile**McMillan**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 6 inches; brown fine sandy loam

Bhs—6 to 9 inches; dark brown very fine sandy loam

Bs1—9 to 16 inches; brown very fine sandy loam

Bs2—16 to 22 inches; strong brown loamy fine sand

Bw—22 to 32 inches; reddish yellow sand

E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Trenary

- A—0 to 2 inches; very dark gray fine sandy loam
- E—2 to 6 inches; brown fine sandy loam
- Bhs—6 to 12 inches; dark reddish brown fine sandy loam
- Bs—12 to 17 inches; reddish brown fine sandy loam
- E'—17 to 26 inches; reddish brown sandy loam
- Bt—26 to 37 inches; dark reddish brown sandy clay loam
- C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: McMillan—sandy glaciofluvial deposits; Trenary—loamy till

Slope: McMillan—1 to 6 percent; Trenary—2 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: McMillan—moderate in the upper part and rapid in the lower part;

Trenary—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland

Cropland

- Crop rotations that include close-growing crops, conservation tillage, grassed waterways, cover crops, and crop residue management help to control runoff and water erosion.
- Conservation tillage, windbreaks, crop residue management, and cover crops help to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.
- Increasing the content of organic matter in the root zone may increase the ability of the soil to hold water, nutrients, and pesticides and reduce the risk of ground-water pollution.
- The amount of nutrients in manure and fertilizer applications should not exceed the nutrient requirements of the plants.

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the McMillan soil, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of the McMillan soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

- In areas of the Trenary soil, backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: McMillan—3s; Trenary—2e

Michigan soil management group: McMillan—4a; Trenary—3a

Habitat type: AVO

120D—McMillan-Trenary fine sandy loams, 6 to 15 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 45 to 65 percent

Trenary and similar soils: 25 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Solona soils in the lower landscape positions

Typical Profile

McMillan

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; very dark gray fine sandy loam

E—4 to 6 inches; brown fine sandy loam

Bhs—6 to 9 inches; dark brown very fine sandy loam

Bs1—9 to 16 inches; brown very fine sandy loam

Bs2—16 to 22 inches; strong brown loamy fine sand

Bw—22 to 32 inches; reddish yellow sand

E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Trenary

A—0 to 2 inches; very dark gray fine sandy loam

E—2 to 6 inches; brown fine sandy loam

Bhs—6 to 12 inches; dark reddish brown fine sandy loam

Bs—12 to 17 inches; reddish brown fine sandy loam

E'—17 to 26 inches; reddish brown sandy loam

Bt—26 to 37 inches; dark reddish brown sandy clay loam

C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: McMillan—sandy glaciofluvial deposits; Trenary—loamy till

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: McMillan—moderate in the upper part and rapid in the lower part;

Trenary—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the McMillan soil, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the McMillan soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- In areas of the Trenary soil, backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: McMillan—4e; Trenary—4e

Michigan soil management group: McMillan—4a; Trenary—3a

Habitat type: AVO

120E—McMillan-Trenary fine sandy loams, 15 to 35 percent slopes

Setting

Landform: Moraines

Map Unit Composition

McMillan and similar soils: 45 to 65 percent

Trenary and similar soils: 25 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Solona soils in the lower landscape positions

Typical Profile

McMillan

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 4 inches; very dark gray fine sandy loam
 E—4 to 6 inches; brown fine sandy loam
 Bh_s—6 to 9 inches; dark brown very fine sandy loam
 Bs₁—9 to 16 inches; brown very fine sandy loam
 Bs₂—16 to 22 inches; strong brown loamy fine sand
 Bw—22 to 32 inches; reddish yellow sand
 E and Bt—32 to 80 inches; light brown sand with bands of brown loamy sand

Trenary

A—0 to 2 inches; very dark gray fine sandy loam
 E—2 to 6 inches; brown fine sandy loam
 Bh_s—6 to 12 inches; dark reddish brown fine sandy loam
 Bs—12 to 17 inches; reddish brown fine sandy loam
 E'—17 to 26 inches; reddish brown sandy loam
 Bt—26 to 37 inches; dark reddish brown sandy clay loam
 C—37 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: McMillan—sandy glaciofluvial deposits; Trenary—loamy till

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: McMillan—moderate in the upper part and rapid in the lower part;

Trenary—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: McMillan—6e; Trenary—6e

Michigan soil management group: McMillan—4a; Trenary—3a

Habitat type: AVO

122—Pits, quarry***Map Unit Composition***

Pits, quarry: 100 percent

Use and Management

Land use: Limestone quarries

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

Interpretive Groups

Land capability classification: None assigned

Michigan soil management group: None assigned

Habitat type: None assigned

126—Pickford silt loam***Setting***

Landform: Lake plains

Map Unit Composition

Pickford and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Rudyard soils in the slightly higher landscape positions

Typical Profile**Pickford**

A—0 to 6 inches; black silt loam

Eg—6 to 9 inches; gray silt loam

Bw—9 to 13 inches; reddish brown silty clay loam

BC—13 to 24 inches; reddish brown clay

C—24 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: At the surface (March, April, May, October, November)

Months in which ponding does not occur: January, February, June, July, August, September, November, December

Deepest ponding: 0.2 foot (March, April, May, October)

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: 1c

Habitat type: TTP

129A—Rudyard silt loam, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Rudyard and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Pickford soils in the slightly lower landscape positions

Typical Profile

Rudyard

A—0 to 5 inches; very dark grayish brown silt loam

B/E—5 to 8 inches; reddish brown silty clay loam and brown silt loam

Bt—8 to 22 inches; reddish brown clay

BC—22 to 29 inches; reddish brown clay

C—29 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: 0.5 foot (March, April, May, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3w

Michigan soil management group: 0b

Habitat type: TAM

130A—Rudyard-Pickford silt loams, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Rudyard and similar soils: 45 to 65 percent

Pickford and similar soils: 35 to 55 percent

Typical Profile

Rudyard

A—0 to 5 inches; very dark grayish brown silt loam

B/E—5 to 8 inches; reddish brown silty clay loam and brown silt loam

Bt—8 to 22 inches; reddish brown clay

BC—22 to 29 inches; reddish brown clay

C—29 to 80 inches; reddish brown clay

Pickford

A—0 to 6 inches; black silt loam

Eg—6 to 9 inches; gray silt loam

Bw—9 to 13 inches; reddish brown silty clay loam

BC—13 to 24 inches; reddish brown clay

C—24 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: Rudyard—0 to 3 percent; Pickford—0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: Rudyard—moderate; Pickford—high

Depth to restrictive feature: More than 80 inches

Drainage class: Rudyard—somewhat poorly drained; Pickford—poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: Rudyard—0.5 feet (March, April, May, October, November); Pickford—at the surface (March, April, May, October, November)

Deepest ponding: Rudyard—none; Pickford—0.2 foot (March, April, May, October)

Months in which ponding does not occur: Rudyard—all year; Pickford—January, February, June, July, August, September, November, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

- Year-round logging roads in areas of the Pickford soil require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Trees are generally not planted on the Pickford soil because of wetness, seedling mortality, and plant competition.

Building site development

- In areas of the Rudyard soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Pickford soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability in areas of the Rudyard soil.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability in areas of the Rudyard soil.
- Filling or mounding with suitable material helps to raise the absorption field above the water table in areas of the Rudyard soil.
- The Pickford soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Rudyard—3w; Pickford—5w

Michigan soil management group: Rudyard—0b; Pickford—1c

Habitat type: Rudyard—TAM; Pickford—TTP

132B—Sugar very fine sandy loam, 0 to 6 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Sugar and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Rudyard soils in the slightly lower landscape positions

Typical Profile

Sugar

Oa—0 to 1 inch; black, highly decomposed plant material

A—1 to 4 inches; black very fine sandy loam

E—4 to 10 inches; pinkish gray loamy very fine sand

Bs—10 to 19 inches; dark brown and strong brown very fine sandy loam

Bw—19 to 26 inches; yellowish brown loamy very fine sand

2B/E—26 to 34 inches; reddish brown silt loam and white loamy very fine sand

2Bt—34 to 45 inches; reddish brown silty clay loam

2C—45 to 80 inches; reddish brown clay

Soil Properties and Qualities

Parent material: Coarse-silty glaciofluvial deposits over clayey glaciolacustrine deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low
Potential for frost action: High
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Available water capacity: High
Shrink-swell potential: High
Permeability: Moderate in the upper part and very slow in the lower part
Flooding: None
Depth to seasonal high water table: 1.5 feet (April)
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 2e
Michigan soil management group: 3/1a
Habitat type: AVO

133—Dorval muck

Setting

Landform: Lake plains

Map Unit Composition

Dorval and similar soils: 90 to 100 percent
 Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Pickford soils in landscape positions similar to those of the Dorval soil

Typical Profile

Dorval

Oa1—0 to 12 inches; black muck
 Oa2—12 to 19 inches; very dark gray muck
 Oe—19 to 25 inches; dark reddish brown mucky peat

Cg—25 to 33 inches; gray, mottled silty clay loam
 C—33 to 80 inches; reddish brown, mottled silty clay

Soil Properties and Qualities

Parent material: Organic, herbaceous material over clayey lacustrine deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Very high

Shrink-swell potential: High

Permeability: Moderate in the upper part and very slow in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (March, April, May, June, October, November, December)

Months in which ponding does not occur: January, February, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, June, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because of wetness and low strength, special harvesting equipment is needed. The equipment can be used only during periods in winter when skid roads and access roads are frozen.
- Because of low strength, suitable surfacing material is needed on year-round roads and landings.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: M/1c

Habitat type: TTM

143—Caffey muck

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Caffey and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the slightly higher landscape positions
- The very poorly drained Tawas soils in landscape positions similar to those of the Caffey soil

Typical Profile**Caffey**

Oa—0 to 6 inches; black muck

Bw—6 to 12 inches; brown, mottled sand

Cg—12 to 21 inches; stratified grayish brown and dark yellowish brown, mottled sand to fine sand

2C—21 to 35 inches; stratified gray, grayish brown, and light olive brown, mottled loamy very fine sand to very fine sandy loam

2Cg—35 to 80 inches; grayish brown very fine sandy loam

Soil Properties and Qualities

Parent material: Glaciofluvial deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Rapid in the upper part and moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (March, April, May)

Months in which ponding does not occur: January, February, June, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: 4/2c

Habitat type: TTM

146A—Allendale-Fibre complex, 0 to 3 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Allendale and similar soils: 45 to 65 percent

Fibre and similar soils: 30 to 45 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in depressions

Typical Profile

Allendale

Ap—0 to 5 inches; black loamy fine sand

E—5 to 8 inches; pinkish gray fine sand

Bhs—8 to 10 inches; dark reddish brown loamy fine sand

Bs—10 to 31 inches; strong brown fine sand

2Bt—31 to 35 inches; reddish brown silty clay

2C—35 to 80 inches; light reddish brown silty clay

Fibre

Oa—0 to 5 inches; black muck

E—5 to 13 inches; brown sand

Bs—13 to 17 inches; dark brown, mottled sand

E/B—17 to 19 inches; reddish brown, mottled loamy sand and fine sandy loam

2Bt—19 to 27 inches; reddish brown, mottled clay

2C—27 to 80 inches; reddish brown, mottled clay

Soil Properties and Qualities

Parent material: Sandy glaciofluvial deposits over clayey glaciolacustrine deposits

Slope: Allendale—0 to 3 percent; Fibre—0 to 2 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Allendale—somewhat poorly drained; Fibre—poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Rapid in the upper part and very slow in the lower part

Flooding: None

Depth to seasonal high water table: Allendale—1 foot (April, May, November); Fibre—
at the surface (April, May)

Deepest ponding: Allendale—none; Fibre—0.3 foot (March, April, May, October)

Months in which ponding does not occur: Allendale—all year; Fibre—January,
February, June, July, August, September, November, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Fibre soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year in areas of the Fibre soil.
- Trees are generally not planted on the Fibre soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the Allendale soil, trench walls should be reinforced.
- In areas of the Allendale soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Fibre soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- The poor filtering capacity of the Allendale soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution in areas of the Allendale soil.
- Backfilling the trench with porous material helps to compensate for the restricted permeability in areas of the Allendale soil.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability in areas of the Allendale soil.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- The Fibre soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Allendale—3w; Fibre—5w

Michigan soil management group: Allendale—4/1b; Fibre—4/1c

Habitat type: Allendale—TMC-D; Fibre—none assigned

167D—Battydoe, stony-Wallace complex, 6 to 15 percent slopes***Setting***

Landform: Ground moraines

Map Unit Composition

Battydoe and similar soils: 45 to 65 percent

Wallace and similar soils: 35 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Finch soils in the slightly lower landscape positions

Typical Profile

Battydoe

Oa—0 to 1 inch; highly decomposed plant material
 A—1 to 3 inches; black fine sandy loam
 E—3 to 5 inches; reddish gray loamy sand
 Bhs—5 to 11 inches; dark reddish brown fine sandy loam
 Bs—11 to 20 inches; reddish brown loamy sand
 BC—20 to 28 inches; brown gravelly fine sandy loam
 C—28 to 80 inches; light brown gravelly fine sandy loam

Wallace

Oe—0 to 2 inches; moderately decomposed plant material
 E—2 to 10 inches; light brownish gray sand
 Bhs—10 to 11 inches; dark reddish brown sand
 Bhsm—11 to 21 inches; dark brown sand
 Bsm—21 to 26 inches; dark brown sand
 BC—26 to 59 inches; brownish yellow sand
 C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Battydoe—till; Wallace—sandy outwash

Slope: 6 to 15 percent

Hazard of soil blowing: Battydoe—moderate; Wallace—severe

Surface runoff class: Battydoe—medium; Wallace—low

Potential for frost action: Battydoe—moderate; Wallace—low

Depth to restrictive feature: Battydoe—more than 80 inches; Wallace—8 to 18 inches to ortstein

Drainage class: Well drained

Available water capacity: Battydoe—moderate; Wallace—very low

Shrink-swell potential: Low

Permeability: Battydoe—moderate; Wallace—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Battydoe soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.

Interpretive Groups

Land capability classification: Battydoe—4e; Wallace—6s

Michigan soil management group: Battydoe—3a; Wallace—5a-h

Habitat type: Battydoe—AVO; Wallace—ATD

173B—Paquin-Finch sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Paquin and similar soils: 40 to 60 percent

Finch and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Spot soils in depressions
- The well drained Wallace soils in the slightly higher landscape positions

Typical Profile

Paquin

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 12 inches; brown sand

Bhs—12 to 14 inches; very dark brown sand

Bhsm—14 to 17 inches; very dark brown sand

Bsm—17 to 27 inches; dark brown sand

BC—27 to 34 inches; strong brown, mottled sand

C—34 to 80 inches; yellowish brown, mottled sand

Finch

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 11 inches; pinkish gray sand

Bsm—11 to 42 inches; dark brown, brown, and dark reddish brown, mottled sand

C—42 to 80 inches; yellowish brown fine sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Paquin—0 to 6 percent; Finch—0 to 3 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: Paquin—10 to 16 inches to ortstein; Finch—7 to 13 inches to ortstein

Drainage class: Paquin—moderately well drained; Finch—somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Paquin—2 feet (April, May); Finch—0.5 foot (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Paquin soil, logging roads should be stabilized.
- In areas of the Finch soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.

Interpretive Groups

Land capability classification: Paquin—6s; Finch—4w

Michigan soil management group: Paquin—5a-h; Finch—5b-h

Habitat type: Paquin—ATD; Finch—TMC-Vac

174B—Crowell-Spot complex, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Crowell and similar soils: 40 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in landscape positions slightly lower than those of the Crowell soil

Typical Profile

Crowell

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; light brownish gray sand

Bs—6 to 15 inches; dark brown and strong brown sand

BC—15 to 22 inches; brownish yellow sand

C—22 to 80 inches; light yellowish brown, mottled sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand
 Bs—10 to 18 inches; dark brown and strong brown sand
 C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Croswell—0 to 6 percent; Spot—0 to 2 percent

Hazard of soil blowing: Croswell—severe; Spot—slight

Surface runoff class: Negligible

Potential for frost action: Croswell—low; Spot—moderate

Depth to restrictive feature: Croswell—more than 80 inches; Spot—8 to 12 inches to ortstein

Drainage class: Croswell—moderately well drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Croswell—rapid; Spot—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Croswell—2 feet (April, May); Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Croswell—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Croswell—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Croswell soil, logging roads should be stabilized.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- In areas of the Spot soil, the seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Spot soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the Croswell soil, trench walls should be reinforced.
- In areas of the Croswell soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Spot soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- The poor filtering capacity of the Croswell soil can result in the pollution of ground water.

- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution in areas of the Croswell soil.
- In areas of the Croswell soil, filling or mounding with suitable material helps to raise the absorption field above the water table.
- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Croswell—4s; Spot—5w

Michigan soil management group: Croswell—5a; Spot—5c-h

Habitat type: Croswell—AQVac; Spot—TTS

175D—Wallace-Spot complex, 0 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Wallace and similar soils: 35 to 55 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in landscape positions slightly lower than those of the Wallace soil

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Wallace—2 to 15 percent; Spot—0 to 2 percent

Hazard of soil blowing: Wallace—severe; Spot—slight

Surface runoff class: Wallace—low; Spot—negligible

Potential for frost action: Wallace—low; Spot—moderate

Depth to restrictive feature: Wallace—8 to 18 inches to ortstein; Spot—8 to 12 inches to ortstein

Drainage class: Wallace—well drained; Spot—poorly drained

Available water capacity: Wallace—very low; Spot—low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Wallace—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Wallace—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Wallace—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in areas of the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Spot soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Wallace soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- The Spot soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope in areas of the Wallace soil.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Wallace—6s; Spot—5w

Michigan soil management group: Wallace—5a-h; Spot—5c-h

Habitat type: Wallace—ATD; Spot—TTS

175E—Wallace-Spot complex, 0 to 35 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Wallace and similar soils: 35 to 55 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The somewhat poorly drained Finch soils in drainageways

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Wallace—2 to 35 percent; Spot—0 to 2 percent

Hazard of soil blowing: Wallace—severe; Spot—slight

Surface runoff class: Wallace—medium; Spot—negligible

Potential for frost action: Wallace—low; Spot—moderate

Depth to restrictive feature: Wallace—8 to 18 inches to ortstein; Spot—8 to 12 inches to ortstein

Drainage class: Wallace—well drained; Spot—poorly drained

Available water capacity: Wallace—very low; Spot—low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Wallace—more than 6.5 feet; Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Wallace—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Wallace—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.
- Because of the slope in areas of the Wallace soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- The seasonal high water table in areas of the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Spot soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites generally can be used only during the driest time of year.
- Because of the erosion hazard in areas of the Wallace soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Wallace soil, and the ponding is a concern in areas of the Spot soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Wallace soil, and the ponding is a concern in areas of the Spot soil.

Interpretive Groups

Land capability classification: Wallace—7s; Spot—5w

Michigan soil management group: Wallace—5a-h; Spot—5c-h

Habitat type: Wallace—ATD; Spot—TTS

176B—Paquin-Spot complex, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Paquin and similar soils: 40 to 60 percent

Spot and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dawson soils in landscape positions similar to those of the Spot soil
- The well drained Wallace soils in the higher landscape positions

Typical Profile**Paquin**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 12 inches; brown sand

Bhs—12 to 14 inches; very dark brown sand

Bhsm—14 to 17 inches; very dark brown sand

Bsm—17 to 27 inches; dark brown sand

BC—27 to 34 inches; strong brown, mottled sand

C—34 to 80 inches; yellowish brown, mottled sand

Spot

Oi—0 to 2 inches; very dark brown peat

E—2 to 8 inches; light brownish gray sand

Bhsm—8 to 10 inches; dark reddish brown sand

Bs—10 to 18 inches; dark brown and strong brown sand

C—18 to 80 inches; light brown and light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: Paquin—0 to 6 percent; Spot—0 to 2 percent

Hazard of soil blowing: Paquin—severe; Spot—slight

Surface runoff class: Paquin—very low; Spot—negligible

Potential for frost action: Paquin—low; Spot—moderate

Depth to restrictive feature: Paquin—10 to 16 inches to ortstein; Spot—8 to 12 inches to ortstein

Drainage class: Paquin—moderately well drained; Spot—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Paquin—2 feet (April, May); Spot—at the surface (January, February, March, April, May, October, November, December)

Deepest ponding: Paquin—none; Spot—0.2 foot (March, April, May, October, November)

Months in which ponding does not occur: Paquin—all year; Spot—January, February, June, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Paquin soil, logging roads should be stabilized.
- In areas of the Spot soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in areas of the Spot soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

- In areas of the Spot soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Spot soil, landing sites can generally be used only during the driest time of year.
- Trees are generally not planted in areas of the Spot soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because cutbanks are not stable and are subject to caving in areas of the Paquin soil, trench walls should be reinforced.
- In areas of the Paquin soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Spot soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- In areas of the Paquin soil, filling or mounding with suitable material helps to raise the absorption field above the water table.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- The Spot soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.

Interpretive Groups

Land capability classification: Paquin—6s; Spot—5w

Michigan soil management group: Paquin—5a-h; Spot—5c-h

Habitat type: Paquin—ATD; Spot—TTS

179B—Wallace sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wallace and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Paquin and somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent
Hazard of soil blowing: Severe
Surface runoff class: Very low
Potential for frost action: Low
Depth to restrictive feature: 8 to 18 inches to ortstein
Drainage class: Well drained
Available water capacity: Very low
Shrink-swell potential: Low
Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part,
 and rapid in the lower part
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5a-h

Habitat type: ATD

179D—Wallace sand, 6 to 15 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wallace and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Paquin and somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand
 Bhs—10 to 11 inches; dark reddish brown sand
 Bhsm—11 to 21 inches; dark brown sand
 Bsm—21 to 26 inches; dark brown sand
 BC—26 to 59 inches; brownish yellow sand
 C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash
Slope: 6 to 15 percent
Hazard of soil blowing: Severe
Surface runoff class: Low
Potential for frost action: Low
Depth to restrictive feature: 8 to 18 inches to ortstein
Drainage class: Well drained
Available water capacity: Very low
Shrink-swell potential: Low
Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Land shaping and installing the distribution lines on the contour help to overcome the slope.

Interpretive Groups

Land capability classification: 6s
Michigan soil management group: 5a-h
Habitat type: ATD

179E—Wallace sand, 15 to 35 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wallace and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Spot soils in depressions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 15 to 35 percent

Hazard of soil blowing: Severe

Surface runoff class: Medium

Potential for frost action: Low

Depth to restrictive feature: 8 to 18 inches to ortstein

Drainage class: Well drained

Available water capacity: Very low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures.

Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5a-h

Habitat type: ATD

179F—Wallace sand, 35 to 60 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wallace and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Spot soils in depressions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 35 to 60 percent

Hazard of soil blowing: Severe

Surface runoff class: Medium

Potential for frost action: Low

Depth to restrictive feature: 8 to 18 inches to ortstein

Drainage class: Well drained

Available water capacity: Very low

Shrink-swell potential: Low

Permeability: Rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5a-h

Habitat type: ATD

180B—Millecoquins silt loam, 0 to 6 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Millecoquins and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Rudyard soils in the slightly lower landscape positions

Typical Profile

Millecoquins

A—0 to 2 inches; very dark gray silt loam

E—2 to 4 inches; reddish gray silt loam

Bhs—4 to 5 inches; dark reddish brown silt loam

Bs—5 to 12 inches; brown silt loam

B/E—12 to 25 inches; mottled, reddish brown silty clay loam and brown silt loam

BC—25 to 31 inches; reddish brown, mottled silty clay loam

C—31 to 55 inches; stratified, mottled, brown silt loam and reddish brown silty clay loam

2C—55 to 80 inches; brown loam

Soil Properties and Qualities

Parent material: Fine-silty glaciofluvial deposits over loamy till

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate
Surface runoff class: Medium
Potential for frost action: High
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Available water capacity: High
Shrink-swell potential: Low
Permeability: Moderately slow
Flooding: None
Depth to seasonal high water table: 1 foot (April)
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 2e
Michigan soil management group: 2.5a
Habitat type: AVO

186D—Sporley silt loam, 6 to 15 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Sporley and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Fence soils in the slightly lower landscape positions
- The well drained Liminga soils in landscape positions similar to those of the Sporley soil

Typical Profile

Sporley

Oe—0 to 4 inches; black, moderately decomposed plant material

E—4 to 8 inches; reddish gray silt loam
 Bhs1—8 to 11 inches; very dark brown silt loam
 Bhs2—11 to 16 inches; dark brown fine sandy loam
 E/B—16 to 22 inches; brown silt loam
 B/E—22 to 45 inches; reddish brown and reddish gray silt loam
 C—45 to 80 inches; reddish brown silt loam

Soil Properties and Qualities

Parent material: Glaciofluvial deposits
Slope: 6 to 15 percent
Hazard of soil blowing: Slight
Surface runoff class: Very high
Potential for frost action: High
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: High
Shrink-swell potential: Low
Permeability: Moderately slow
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 3e
Michigan soil management group: 3a
Habitat type: ATD

186E—Sporley silt loam, 15 to 35 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Sporley and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Hendrie soils in depressions
- The well drained Liminga soils in landscape positions similar to those of the Sporley soil

Typical Profile**Sporley**

Oe—0 to 4 inches; black, moderately decomposed plant material

E—4 to 8 inches; reddish gray silt loam

Bhs1—8 to 11 inches; very dark brown silt loam

Bhs2—11 to 16 inches; dark brown fine sandy loam

E/B—16 to 22 inches; brown silt loam

B/E—22 to 45 inches; reddish brown and reddish gray silt loam

C—45 to 80 inches; reddish brown silt loam

Soil Properties and Qualities

Parent material: Glaciofluvial deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Slight

Surface runoff class: Very high

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderately slow

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: 3a
Habitat type: ATD

186F—Sporley silt loam, 35 to 60 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Sporley and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The poorly drained Hendrie soils in depressions
- The well drained Liminga soils in landscape positions similar to those of the Sporley soil

Typical Profile

Sporley

Oe—0 to 4 inches; black, moderately decomposed plant material

E—4 to 8 inches; reddish gray silt loam

Bhs1—8 to 11 inches; very dark brown silt loam

Bhs2—11 to 16 inches; dark brown fine sandy loam

E/B—16 to 22 inches; brown silt loam

B/E—22 to 45 inches; reddish brown and reddish gray silt loam

C—45 to 80 inches; reddish brown silt loam

Soil Properties and Qualities

Parent material: Glaciofluvial deposits

Slope: 35 to 60 percent

Hazard of soil blowing: Slight

Surface runoff class: Very high

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderately slow

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging

roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

- The grade should be kept as low as possible.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: 3a

Habitat type: ATD

187B—Auger silt loam, 0 to 6 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Auger and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Annanias soils in the slightly lower landscape positions
- The well drained Zandi soils in the higher landscape positions

Typical Profile

Auger

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 5 inches; brown silt loam

Bhs—5 to 6 inches; black silt loam

Bs—6 to 15 inches; dark reddish brown and reddish brown silt loam

BC—15 to 25 inches; brown silt loam

C—25 to 80 inches; stratified pale brown, light yellowish brown, and brown silt loam to silt

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Slight

Surface runoff class: Low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: 2.5 feet (April)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 3a

Habitat type: Primary—TMC-D; secondary—ATD

188—Hendrie mucky peat

Setting

Landform: Lake plains

Map Unit Composition

Hendrie and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Annanias soils in the slightly higher landscape positions
- The poorly drained Gogomain and very poorly drained Tawas soils in landscape positions similar to those of the Hendrie soil

Typical Profile

Hendrie

Oe—0 to 4 inches; dark brown, moderately decomposed plant material

Eg—4 to 7 inches; grayish brown, mottled silt loam

Bw—7 to 16 inches; brown, mottled silt loam

C—16 to 80 inches; pinkish gray and light brownish gray, mottled silt loam

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: Very high

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: At the surface (March, April, May, October)

Months in which ponding does not occur: January, February, June, July, August, September, December
Deepest ponding: 0.2 foot (March, April, May, October, November)

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: 2.5c

Habitat type: None assigned

189A—Bodi-Chesbrough silt loams, 0 to 3 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Bodi and similar soils: 45 to 65 percent

Chesbrough and similar soils: 35 to 55 percent

Typical Profile

Bodi

Oe—0 to 1 inch; dark brown, moderately decomposed plant material

E—1 to 4 inches; brown silt loam

Bhs—4 to 5 inches; dark brown silt loam

Bs—5 to 17 inches; brown and strong brown silt loam

2Bs—17 to 24 inches; strong brown sand

3E/Bx—24 to 44 inches; brown and pinkish gray loamy sand and reddish brown sandy loam

3Cd—44 to 80 inches; reddish brown loamy sand

Chesbrough

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; black silt loam

E—2 to 4 inches; grayish brown silt loam

Bs—4 to 10 inches; brown, mottled silt loam

2Bs—10 to 12 inches; strong brown, mottled gravelly loamy sand

3B/E—12 to 16 inches; mottled, reddish brown sandy loam and light brown loamy sand

3B/Ex—16 to 22 inches; mottled, reddish brown sandy loam and brown loamy sand

3Bt—22 to 30 inches; reddish brown sandy loam

3C—30 to 80 inches; light brown and reddish brown sandy loam and loamy sand

Soil Properties and Qualities

Parent material: Till

Slope: Bodi—0 to 6 percent; Chesbrough—0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: Bodi—moderate; Chesbrough—high

Depth to restrictive feature: Bodi—20 to 30 inches to a fragipan and 36 to 55 inches to dense material; Chesbrough—13 to 20 inches to a fragipan

Drainage class: Bodi—moderately well drained; Chesbrough—somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Bodi—moderate in the upper part and very slow in the lower part; Chesbrough—moderate in the upper part, very slow in the middle part, and moderate in the lower part

Flooding: None

Depth to seasonal high water table: Bodi—1.5 feet (March, April, May, October, November); Chesbrough—0.5 foot (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: Bodi—3e; Chesbrough—4w

Michigan soil management group: Bodi—3a-a; Chesbrough—3b-a

Habitat type: Bodi—ATD; Chesbrough—TMC-D

190B—Bodi silt loam, 0 to 6 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Bodi and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Chesbrough soils in the slightly lower landscape positions

Typical Profile

Bodi

Oe—0 to 1 inch; dark brown, moderately decomposed plant material

E—1 to 4 inches; brown silt loam

Bhs—4 to 5 inches; dark brown silt loam

Bs—5 to 17 inches; brown and strong brown silt loam

2Bs—17 to 24 inches; strong brown sand

3E/Bx—24 to 44 inches; brown and pinkish gray loamy sand and reddish brown sandy loam

3Cd—44 to 80 inches; reddish brown loamy sand

Soil Properties and Qualities

Parent material: Till

Slope: 0 to 6 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: 20 to 30 inches to a fragipan; 36 to 55 inches to dense material

Drainage class: Moderately well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate in the upper part and very slow in the lower part

Flooding: None

Depth to seasonal high water table: 1.5 feet (March, April, May, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 3a-a

Habitat type: ATD

191D—Widgeon-Kalkaska complex, 6 to 15 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Widgeon and similar soils: 40 to 60 percent

Kalkaska and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained McMillan soils in landscape positions similar to those of the Widgeon soil
- The well drained Sugar soils in landscape positions similar to those of the Kalkaska soil

Typical Profile

Widgeon

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 5 inches; dark brown silt loam

E—5 to 9 inches; brown silt loam

Bhs—9 to 12 inches; dark brown silt loam

Bs—12 to 16 inches; brown silt loam

E/B—16 to 32 inches; light brownish gray silt loam and reddish brown silty clay loam

C—32 to 80 inches; stratified, mottled, brown, yellowish brown, and pale brown silt loam to reddish brown silty clay loam

Kalkaska

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Widgeon—lacustrine deposits; Kalkaska—sandy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Widgeon—moderate; Kalkaska—severe

Surface runoff class: Widgeon—very high; Kalkaska—very low

Potential for frost action: Widgeon—high; Kalkaska—low

Depth to restrictive feature: More than 80 inches

Drainage class: Widgeon—moderately well drained; Kalkaska—somewhat excessively drained

Available water capacity: Widgeon—moderate; Kalkaska—low

Shrink-swell potential: Low

Permeability: Widgeon—moderate in the upper part and moderately slow in the lower part; Kalkaska—rapid

Flooding: None

Depth to seasonal high water table: Widgeon—1.5 feet (March, April, May, October, November); Kalkaska—more than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Widgeon soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Kalkaska soil, logging roads should be stabilized.

Building site development

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- In areas of the Widgeon soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- Because cutbanks are not stable and are subject to caving in areas of the Kalkaska soil, trench walls should be reinforced.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- In areas of the Widgeon soil, backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability in areas of the Widgeon soil.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- The poor filtering capacity of the Kalkaska soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Widgeon—4e; Kalkaska—6s

Michigan soil management group: Widgeon—3/2a; Kalkaska—5a

Habitat type: Widgeon—AVO; Kalkaska—ATD

193A—Annaias silt loam, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Annaias and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Auger soils in the slightly higher landscape positions
- The poorly drained Hendrie soils in depressions

Typical Profile

Annaias

Oa—0 to 4 inches; highly decomposed plant material

E—4 to 7 inches; pinkish gray silt loam

Bhs—7 to 10 inches; dark brown silt loam

Bs—10 to 15 inches; brown silt loam

BC—15 to 26 inches; yellowish brown silt loam

C1—26 to 47 inches; stratified reddish brown and pale brown silt loam to very fine sandy loam

C2—47 to 80 inches; stratified reddish brown and light brownish gray silt loam to silt

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: Low

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: 0.5 foot (April)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3w

Michigan soil management group: 3a-s

Habitat type: Primary—TMC; secondary—TMC-D

194A—Hendrie-Annianias complex, 0 to 3 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Hendrie and similar soils: 45 to 55 percent

Annianias and similar soils: 30 to 45 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Auger soils in the slightly higher landscape positions
- The poorly drained Gogomain soils in landscape positions similar to those of the Hendrie soil

Typical Profile**Hendrie**

Oe—0 to 4 inches; dark brown, moderately decomposed plant material

Eg—4 to 7 inches; grayish brown, mottled silt loam

Bw—7 to 16 inches; brown, mottled silt loam

C—16 to 80 inches; pinkish gray and light brownish gray, mottled silt loam

Annianias

Oa—0 to 4 inches; highly decomposed plant material

E—4 to 7 inches; pinkish gray silt loam

Bhs—7 to 10 inches; dark brown silt loam

Bs—10 to 15 inches; brown silt loam

BC—15 to 26 inches; yellowish brown silt loam

C1—26 to 47 inches; stratified reddish brown and pale brown silt loam to very fine sandy loam

C2—47 to 80 inches; stratified reddish brown and light brownish gray silt loam to silt

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: Hendrie—0 to 2 percent; Annianias—0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: Hendrie—negligible; Annianias—low

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Hendrie—poorly drained; Annianias—somewhat poorly drained

Available water capacity: Hendrie—very high; Annianias—high

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: Hendrie—at the surface (March, April, May, October); Annanias—0.5 foot (April)

Deepest ponding: Hendrie—0.2 foot (March, April, May, October, November); Annanias—none

Months in which ponding does not occur: Hendrie—January, February, June, July, August, September, December; Annanias—all year

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Hendrie soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- In areas of the Hendrie soil, landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Hendrie soil because of wetness, seedling mortality, and plant competition.

Building site development

- The Hendrie soil is generally unsuited to building site development because of the ponding.
- In areas of the Annanias soil, buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The Hendrie soil is generally unsuited to use as a site for septic tank absorption fields because of the ponding.
- In areas of the Annanias soil, filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: Hendrie—5w; Annanias—3w

Michigan soil management group: Hendrie—2.5c; Annanias—3a-s

Habitat type: Hendrie—none assigned; Annanias—TMC

195A—Chesbrough silt loam, 0 to 3 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Chesbrough and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The moderately well drained Bodi soils in the slightly higher landscape positions

Typical Profile

Chesbrough

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 2 inches; black silt loam

E—2 to 4 inches; grayish brown silt loam

Bs—4 to 10 inches; brown, mottled silt loam

2Bs—10 to 12 inches; strong brown, mottled gravelly loamy sand

3B/E—12 to 16 inches; mottled, reddish brown sandy loam and light brown loamy sand

3B/Ex—16 to 22 inches; mottled, reddish brown sandy loam and brown loamy sand

3Bt—22 to 30 inches; reddish brown sandy loam

3C—30 to 80 inches; light brown and reddish brown sandy loam and loamy sand

Soil Properties and Qualities

Parent material: Till

Slope: 0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: 13 to 20 inches to a fragipan

Drainage class: Somewhat poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate in the upper part, very slow in the middle part, and moderate in the lower part

Flooding: None

Depth to seasonal high water table: 0.5 foot (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 4w

Michigan soil management group: 3b-a

Habitat type: TMC-D

197D—Zandi silt loam, 6 to 15 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Zandi and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Liminga soils in landscape positions similar to those of the Zandi soil
- The somewhat poorly drained Annanias soils in the lower landscape positions

Typical Profile

Zandi

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 6 inches; brown silt loam

Bhs—6 to 7 inches; dark brown silt loam

Bs—7 to 12 inches; strong brown very fine sandy loam

Bw—12 to 22 inches; brown very fine sandy loam

E and Bt—22 to 37 inches; brown loamy very fine sand and very fine sandy loam

C—37 to 80 inches; stratified brown very fine sand and strong brown loamy very fine sand

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Slight

Surface runoff class: Medium

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 3a

Habitat type: ATD

197E—Zandi silt loam, 15 to 35 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Zandi and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Liminga soils in landscape positions similar to those of the Zandi soil
- The somewhat poorly drained Annanias soils in the lower landscape positions

Typical Profile**Zandi**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 6 inches; silt loam

Bhs—6 to 7 inches; silt loam

Bs—7 to 12 inches; very fine sandy loam

Bw—12 to 22 inches; very fine sandy loam

E and Bt—22 to 37 inches; stratified loamy very fine sand to very fine sandy loam

C—37 to 80 inches; stratified very fine sand to loamy very fine sand

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 15 to 35 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: 3a

Habitat type: ATD

198B—Vilas loamy sand, 0 to 6 percent slopes***Setting***

Landform: Outwash plains

Map Unit Composition

Vilas and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the lower landscape positions

Typical Profile**Vilas**

A—0 to 3 inches; black loamy sand

E—3 to 5 inches; brown sand

Bs1—5 to 9 inches; brown loamy sand

Bs2—9 to 20 inches; strong brown sand

C—20 to 80 inches; light yellowish brown, yellowish brown, and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Available water capacity: Low

Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—wildlife habitat (fig. 7)

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s
Michigan soil management group: 4a
Habitat type: AQVac

198D—Vilas loamy sand, 6 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Vilas and similar soils: 90 to 100 percent
 Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the lower landscape positions

Typical Profile

Vilas

A—0 to 3 inches; black loamy sand
 E—3 to 5 inches; brown sand
 Bs1—5 to 9 inches; brown loamy sand
 Bs2—9 to 20 inches; strong brown sand
 C—20 to 80 inches; light yellowish brown, yellowish brown, and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash
Slope: 6 to 15 percent
Hazard of soil blowing: Moderate
Surface runoff class: Very low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained



Figure 7.—A prescribed burn in an area of Vilas loamy sand, 0 to 6 percent slopes. The controlled burns are used to maintain openings for wildlife, such as bluebirds, sharptail grouse, sandhill cranes, meadowlarks, northern harriers, and bobolinks. Prairie grasses and blueberries also benefit from maintenance of these openings.

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 4a

Habitat type: AQVac

199B—Auger-Annianias silt loams, 0 to 6 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Auger and similar soils: 40 to 60 percent

Annianias and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Hendrie soils in depressions

Typical Profile**Auger**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 5 inches; brown silt loam

Bhs—5 to 6 inches; black silt loam

Bs—6 to 15 inches; dark reddish brown and reddish brown silt loam

BC—15 to 25 inches; brown silt loam

C—25 to 80 inches; stratified pale brown, light yellowish brown, and brown silt loam to silt

Annianias

Oa—0 to 4 inches; highly decomposed plant material

E—4 to 7 inches; pinkish gray silt loam

Bhs—7 to 10 inches; dark brown silt loam

Bs—10 to 15 inches; brown silt loam

BC—15 to 26 inches; yellowish brown silt loam

C1—26 to 47 inches; stratified reddish brown and pale brown silt loam to very fine sandy loam

C2—47 to 80 inches; stratified reddish brown and light brownish gray silt loam to silt

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: Auger—0 to 6 percent; Annianias—0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: Low

Potential for frost action: Auger—moderate; Annianias—high

Depth to restrictive feature: More than 80 inches

Drainage class: Auger—moderately well drained; Annianias—somewhat poorly drained

Available water capacity: Auger—very high; Annanias—moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: Auger—2.5 feet (April); Annanias—0.5 foot (April)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- In areas of the Annanias soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- In areas of the Annanias soil, the seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- In areas of the Annanias soil, backfilling the trenches with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: Auger—3e; Annanias—3w

Michigan soil management group: Auger—3a; Annanias—3a-s

Habitat type: Auger—TMC-D; Annanias—TMC

200B—Pence loamy sand, 0 to 6 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

A—0 to 1 inch; black loamy sand

E—1 to 4 inches; brown loamy sand

Bhs—4 to 6 inches; dark reddish brown sandy loam

Bs—6 to 17 inches; dark brown gravelly sandy loam

2BC—17 to 28 inches; strong brown coarse sand and sand

2C—28 to 80 inches; strong brown gravelly sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate or moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 4a-a

Habitat type: ATD

200D—Pence loamy sand, 6 to 15 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

A—0 to 1 inch; black loamy sand

E—1 to 4 inches; brown loamy sand

Bhs—4 to 6 inches; dark reddish brown sandy loam

Bs—6 to 17 inches; dark brown gravelly sandy loam

2BC—17 to 28 inches; strong brown coarse sand and sand

2C—28 to 80 inches; strong brown gravelly sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 6 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate or moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 4a-a

Habitat type: ATD

200E—Pence loamy sand, 15 to 35 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Pence and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Pence soil

Typical Profile

Pence

A—0 to 1 inch; black loamy sand

E—1 to 4 inches; brown loamy sand

Bhs—4 to 6 inches; dark reddish brown sandy loam

Bs—6 to 17 inches; dark brown gravelly sandy loam

2BC—17 to 28 inches; strong brown coarse sand and sand

2C—28 to 80 inches; strong brown gravelly sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: Medium

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate or moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: 4a-a

Habitat type: ATD

201B—Croswell, rarely flooded-Deford, frequently flooded, complex, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Croswell, rarely flooded, and similar soils: 45 to 65 percent

Deford, frequently flooded, and similar soils: 25 to 45 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Tawas soils in landscape positions similar to those of the Deford soil

Typical Profile**Croswell**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 6 inches; light brownish gray sand

Bs—6 to 15 inches; dark brown and strong brown sand

BC—15 to 22 inches; brownish yellow sand

C—22 to 80 inches; light yellowish brown, mottled sand

Deford

Oa—0 to 5 inches; black muck

C—5 to 32 inches; light yellowish brown, mottled fine sand

Cg—32 to 80 inches; light brownish gray and dark gray fine sand

Soil Properties and Qualities

Parent material: Croswell—sandy glaciofluvial deposits; Deford—sandy alluvium

Slope: Croswell—0 to 6 percent; Deford—0 to 2 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Croswell—low; Deford—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Croswell—moderately well drained; Deford—poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Frequency of flooding: Croswell—rare (April, May); Deford—frequent (April, May, October, November)

Depth to seasonal high water table: Croswell—2 feet (April, May); Deford—at the surface (January, February, March, April, May, October, November, December)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Croswell soil, logging roads should be stabilized.
- In areas of the Deford soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table in areas of the Deford soil restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- In areas of the Deford soil, year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Trees are generally not planted in areas of the Deford soil because of wetness, seedling mortality, and plant competition.

Building site development

- Because of flooding, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of flooding, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Croswell—4s; Deford—7w

Michigan soil management group: Croswell—5a; Deford—L-4c

Habitat type: Croswell—AQVac; Deford—FMC

202B—Whitewash sand, 0 to 4 percent slopes

Setting

Landform: Alluvial flats

Map Unit Composition

Whitewash and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The excessively drained Deer Park soils in the slightly higher landscape positions

Typical Profile

Whitewash

Oe—0 to 3 inches; moderately decomposed plant material

C—3 to 7 inches; yellowish brown sand

Ab—7 to 9 inches; very dark grayish brown fine sandy loam

C'—9 to 80 inches; yellowish brown sand with strata of fine sandy loam to silt loam

Soil Properties and Qualities

Parent material: Sandy alluvium

Slope: 0 to 4 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Moderately rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 3s
Michigan soil management group: 5.7a
Habitat type: AVO

203D—Frohling loamy sand, 8 to 15 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Frohling and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Deerton and somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Frohling soil

Typical Profile

Frohling

Oe—0 to 1 inch; black, moderately decomposed plant material
 E—1 to 3 inches; reddish gray loamy sand
 Bh_s—3 to 7 inches; dark brown fine sandy loam
 Bs—7 to 19 inches; brown fine sandy loam
 B/Ex—19 to 55 inches; reddish brown sandy loam and brown and reddish brown loamy sand
 C—55 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Coarse-loamy till

Slope: 8 to 15 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: 16 to 24 inches to a fragipan

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate in the upper part, very slow in the middle part, and moderate in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 3a-f

Habitat type: ATD

203E—Frohling loamy sand, 15 to 35 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Frohling and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The well drained Deerton and somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Frohling soil

Typical Profile

Frothing

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 3 inches; reddish gray loamy sand

Bhs—3 to 7 inches; dark brown fine sandy loam

Bs—7 to 19 inches; brown fine sandy loam

B/Ex—19 to 55 inches; reddish brown sandy loam and brown and reddish brown loamy sand

C—55 to 80 inches; reddish brown sandy loam

Soil Properties and Qualities

Parent material: Coarse-loamy till

Slope: 15 to 35 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: Moderate

Depth to restrictive feature: 16 to 24 inches to a fragipan

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderate in the upper part, very slow in the middle part, and moderate in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because of the slope, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 3a-f

Habitat type: ATD

204—Gogomain muck

Setting

Landform: Lake plains

Map Unit Composition

Gogomain and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The very poorly drained Dorval soils in landscape positions similar to those of the Gogomain soil
- The somewhat poorly drained Rudyard soils in the slightly higher landscape positions

Typical Profile

Gogomain

Oa—0 to 6 inches; black muck

Eg—6 to 9 inches; gray very fine sandy loam

Bw—9 to 18 inches; yellowish brown very fine sandy loam

2C1—18 to 32 inches; reddish brown silty clay loam

2C2—32 to 80 inches; reddish brown silty clay

Soil Properties and Qualities

Parent material: Glaciolacustrine deposits

Slope: 0 to 2 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: Moderate

Shrink-swell potential: High

Permeability: Moderate in the upper part and very slow in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (April, May, October, November)

Months in which ponding does not occur: January, February, June, July, August, September, November, December

Deepest ponding: 0.2 foot (March, April, May, October)

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the sticky and plastic subsoil, logging roads should be graveled and in some areas landings should be stabilized.
- Windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- The seasonal high water table restricts the use of equipment to midsummer, when the soil is dry, or midwinter, when the soil is frozen or has adequate snow cover.
- Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.
- Landing sites generally can be used only during the driest time of year.
- Because of wetness, seedling mortality, and plant competition, trees are generally not planted on this soil.

Building site development

- Because of ponding, 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.

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: 4/1c

Habitat type: None assigned

205B—Kalkaska sand, 0 to 6 percent slopes, burned***Setting***

Landform: Outwash plains

Map Unit Composition

Kalkaska and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the slightly lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile**Kalkaska**

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5a

Habitat type: AQVac

205D—Kalkaska sand, 6 to 15 percent slopes, burned***Setting***

Landform: Outwash plains

Map Unit Composition

Kalkaska and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions
- The poorly drained Kinross soils in depressions

Typical Profile**Kalkaska**

A—0 to 2 inches; black sand

E—2 to 6 inches; brown sand

Bhs—6 to 8 inches; dark reddish brown sand

Bs—8 to 16 inches; strong brown sand

BC—16 to 26 inches; strong brown sand

C—26 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 6 to 15 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5a

Habitat type: AQVac

206B—Deerton loamy sand, 0 to 6 percent slopes***Setting***

Landform: Ground moraines

Map Unit Composition

Deerton and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat excessively drained Kalkaska soils in landscape positions similar to those of the Deerton soil

Typical Profile**Deerton**

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 6 inches; reddish gray loamy sand

Bhs—6 to 23 inches; dark reddish brown loamy sand

C—23 to 33 inches; brown sand

2Cr—33 to 55 inches; pinkish gray, weathered bedrock

2R—55 to 80 inches; unweathered bedrock

Soil Properties and Qualities

Parent material: Sandy outwash

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: Low

Depth to restrictive feature: 24 to 40 inches to bedrock (paralithic); 30 to 60 inches to bedrock (lithic)

Drainage class: Well drained

Available water capacity: Very low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major concerns affect the use of this soil as woodland.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- Because of the depth to bedrock, this soil is generally unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 4/Ra

Habitat type: ATD

211D—Frohling-Wallace complex, 6 to 15 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Frohling and similar soils: 35 to 55 percent

Wallace and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions
- The well drained Deerton soils in landscape positions similar to those of the major soils

Typical Profile

Frohling

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 3 inches; reddish gray loamy sand

Bhs—3 to 7 inches; dark brown fine sandy loam

Bs—7 to 19 inches; brown fine sandy loam

B/Ex—19 to 55 inches; reddish brown sandy loam and brown and reddish brown loamy sand

C—55 to 80 inches; reddish brown sandy loam

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand
 Bhs—10 to 11 inches; dark reddish brown sand
 Bhsm—11 to 21 inches; dark brown sand
 Bsm—21 to 26 inches; dark brown sand
 BC—26 to 59 inches; brownish yellow sand
 C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Frohling—coarse-loamy till; Wallace—sandy outwash

Slope: Frohling—8 to 15 percent; Wallace—6 to 15 percent

Hazard of soil blowing: Frohling—moderate; Wallace—severe

Surface runoff class: Frohling—high; Wallace—low

Potential for frost action: Frohling—moderate; Wallace—low

Depth to restrictive feature: Frohling—16 to 24 inches to a fragipan; Wallace—8 to 18 inches to ortstein

Drainage class: Well drained

Available water capacity: Frohling—low; Wallace—very low

Shrink-swell potential: Low

Permeability: Frohling—moderate in the upper part, very slow in the middle part, and rapid in the lower part; Wallace—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- In areas of the Frohling soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.
- In areas of the Frohling soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- Backfilling the trench with porous material helps to compensate for the restricted permeability in areas of the Frohling soil.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- The restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly in areas of the Wallace soil.

Interpretive Groups

Land capability classification: Frohling—6s; Wallace—6s

Michigan soil management group: Frohling—3a-f; Wallace—5a-h

Habitat type: ATD

211E—Frohling-Wallace complex, 15 to 35 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

Frohling and similar soils: 35 to 55 percent

Wallace and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions
- The well drained Deerton soils in landscape positions similar to those of the major soils

Typical Profile

Frohling

Oe—0 to 1 inch; black, moderately decomposed plant material

E—1 to 3 inches; reddish gray loamy sand

Bhs—3 to 7 inches; dark brown fine sandy loam

Bs—7 to 19 inches; brown fine sandy loam

B/Ex—19 to 55 inches; reddish brown sandy loam and brown and reddish brown loamy sand

C—55 to 80 inches; reddish brown sandy loam

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Frohling—coarse-loamy till; Wallace—sandy outwash

Slope: 15 to 35 percent

Hazard of soil blowing: Frohling—moderate; Wallace—severe

Surface runoff class: Frohling—high; Wallace—medium

Potential for frost action: Frohling—moderate; Wallace—low

Depth to restrictive feature: Frohling—16 to 24 inches to a fragipan; Wallace—8 to 18 inches to ortstein

Drainage class: Well drained

Available water capacity: Frohling—low; Wallace—very low

Shrink-swell potential: Low

Permeability: Frohling—moderate in the upper part, very slow in the middle part, and rapid in the lower part; Wallace—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.
- In areas of the Frohling soil, windthrow can be minimized by using harvest methods that do not leave the remaining trees widely spaced.

Building site development

- Because of the slope, these soils are generally unsuited to building site development.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Frohling—6s; Wallace—7s

Michigan soil management group: Frohling—3a-f; Wallace—5a-h

Habitat type: ATD

212—Markey mucky peat***Setting***

Landform: Fens on lake plains and outwash plains

Map Unit Composition

Markey and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The poorly drained Kinross soils in landscape positions similar to those of the Markey soil

Typical Profile**Markey**

Oe—0 to 3 inches; very dark brown mucky peat

Oa—3 to 20 inches; very dark gray and very dark grayish brown muck

Cg—20 to 80 inches; brown sand

Soil Properties and Qualities

Parent material: Organic, herbaceous material over outwash

Slope: 0 to 1 percent

Hazard of soil blowing: Moderate

Surface runoff class: Negligible

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: At the surface (January, February, March, April, May, June, October, November, December)

Months in which ponding does not occur: January, February, July, August, September, December

Deepest ponding: 0.2 foot (March, April, May, June, October, November)

Use and Management

Land use: Dominant use—wetland wildlife

Woodland

- Opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of this soil to winter, when roads may be frozen.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of ponding, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: M/4c

Habitat type: None assigned

214D—Rousseau-Markey complex, 0 to 15 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Markey and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in drainageways

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Markey

Oe—0 to 3 inches; very dark brown mucky peat

Oa—3 to 20 inches; very dark gray and very dark grayish brown muck

Cg—20 to 80 inches; brown sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Markey—organic, herbaceous material over outwash

Slope: Rousseau—2 to 15 percent; Markey—0 to 1 percent

Hazard of soil blowing: Rousseau—severe; Markey—moderate

Surface runoff class: Rousseau—low; Markey—negligible

Potential for frost action: Rousseau—low; Markey—high

Depth to restrictive feature: More than 80 inches

Drainage class: Rousseau—excessively drained; Markey—very poorly drained

Available water capacity: Rousseau—low; Markey—high

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Markey—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Markey—at the surface (January, February, March, April, May, June, October, November, December)

Deepest ponding: Rousseau—none; Markey—0.2 foot (March, April, May, June, October, November)

Months in which ponding does not occur: Rousseau—all year; Markey—January, February, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- In areas of the Markey soil, opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of the Markey soil to winter, when roads may be frozen.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- In areas of the Rousseau soil, buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- The Markey soil is generally unsuited to building site development because of the ponding.

Septic tank absorption fields

- In areas of the Rousseau soil, land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Rousseau soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.
- The Markey soil is generally unsuited to use as a site for septic tank absorption fields because of ponding and low strength.

Interpretive Groups

Land capability classification: Rousseau—4e; Markey—6w

Michigan soil management group: Rousseau—5a; Markey—M/4c

Habitat type: Rousseau—AQVac; Markey—none assigned

214E—Rousseau-Markey complex, 0 to 35 percent slopes

Setting

Landform: Dunes

Map Unit Composition

Rousseau and similar soils: 40 to 60 percent

Markey and similar soils: 35 to 55 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in drainageways

Typical Profile

Rousseau

Oi—0 to 1 inch; slightly decomposed plant material

E—1 to 4 inches; dark gray fine sand

Bs—4 to 20 inches; brown and strong brown fine sand

BC—20 to 33 inches; light yellowish brown fine sand

C1—33 to 66 inches; light yellowish brown fine sand

C2—66 to 80 inches; yellowish brown sand

Markey

Oe—0 to 3 inches; very dark brown mucky peat

Oa—3 to 20 inches; very dark gray and very dark grayish brown muck

Cg—20 to 80 inches; brown sand

Soil Properties and Qualities

Parent material: Rousseau—eolian sands; Markey—organic, herbaceous material over outwash

Slope: Rousseau—2 to 35 percent; Markey—0 to 1 percent

Hazard of soil blowing: Rousseau—severe; Markey—moderate

Surface runoff class: Rousseau—low; Markey—negligible

Potential for frost action: Rousseau—low; Markey—high

Depth to restrictive feature: More than 80 inches

Drainage class: Rousseau—excessively drained; Markey—very poorly drained

Available water capacity: Rousseau—low; Markey—high

Shrink-swell potential: Low

Permeability: Rousseau—rapid; Markey—moderate in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: Rousseau—more than 6.5 feet; Markey—at the surface (January, February, March, April, May, June, October, November, December)

Deepest ponding: Rousseau—none; Markey—0.2 foot (March, April, May, June, October, November)

Months in which ponding does not occur: Rousseau—all year; Markey—January, February, July, August, September, December

Use and Management

Land use: Dominant use—woodland

Woodland

- Because of the slope in areas of the Rousseau soil, special care is needed in laying out logging roads and landings and in operating logging equipment. Logging roads should be designed so that they conform to the topography.
- Small areas of nearly level included soils, if any are available, and suitable nearly level adjacent areas should be selected as sites for landings.
- Because of the erosion hazard in areas of the Rousseau soil, water should be removed from logging roads by water bars, out-sloping or in-sloping road surfaces, culverts, and drop structures. Building logging roads on the contour or on the gentler slopes and seeding logging roads, skid roads, and landings after the trees are logged also help to prevent excessive soil loss.
- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- In areas of the Markey soil, opportunities for logging are limited because the soil supports very few trees. Low strength also limits logging activities.
- Wetness and instability limit logging in areas of the Markey soil to winter, when roads may be frozen.

Building site development

- These soils are generally unsuited to building site development. The slope is a concern in areas of the Rousseau soil, and the ponding is a concern in areas of the Markey soil.

Septic tank absorption fields

- These soils are generally unsuited to use as sites for septic tank absorption fields. The slope is a concern in areas of the Rousseau soil, and the ponding and low strength are concerns in areas of the Markey soil.

Interpretive Groups

Land capability classification: Rousseau—6e; Markey—6w

Michigan soil management group: Rousseau—5a; Markey—M/4c

Habitat type: Rousseau—AQVac; Markey—none assigned

215B—Wallace-Alcona complex, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Wallace and similar soils: 40 to 60 percent

Alcona and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand
 BC—26 to 59 inches; brownish yellow sand
 C—59 to 80 inches; light yellowish brown sand

Alcona

Oe—0 to 1 inch; moderately decomposed plant material
 E—1 to 3 inches; pinkish gray fine sandy loam
 Bs—3 to 17 inches; dark brown fine sandy loam
 B/E—17 to 23 inches; dark yellowish brown very fine sandy loam
 E/B—23 to 54 inches; light yellowish brown loamy fine sand and reddish brown fine sandy loam
 C—54 to 80 inches; light brown, stratified loamy very fine sand to fine sandy loam to very fine sandy loam

Soil Properties and Qualities

Parent material: Wallace—sandy outwash; Alcona—loamy glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Wallace—severe; Alcona—moderate

Surface runoff class: Wallace—very low; Alcona—low

Potential for frost action: Wallace—low; Alcona—moderate

Depth to restrictive feature: Wallace—8 to 18 inches to ortstein; Alcona—more than 80 inches

Drainage class: Well drained

Available water capacity: Wallace—very low; Alcona—moderate

Shrink-swell potential: Low

Permeability: Wallace—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part; Alcona—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.
- In areas of the Alcona soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of the Wallace soil can result in the pollution of ground water.
- In areas of the Wallace soil, the restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Wallace—6s; Alcona—2e

Michigan soil management group: Wallace—5a-h; Alcona—3a

Habitat type: Wallace—ATD; Alcona—AVO

215D—Wallace-Alcona complex, 6 to 15 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Wallace and similar soils: 40 to 60 percent

Alcona and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions

Typical Profile

Wallace

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 10 inches; light brownish gray sand

Bhs—10 to 11 inches; dark reddish brown sand

Bhsm—11 to 21 inches; dark brown sand

Bsm—21 to 26 inches; dark brown sand

BC—26 to 59 inches; brownish yellow sand

C—59 to 80 inches; light yellowish brown sand

Alcona

Oe—0 to 1 inch; moderately decomposed plant material

E—1 to 3 inches; pinkish gray fine sandy loam

Bs—3 to 17 inches; dark brown fine sandy loam

B/E—17 to 23 inches; dark yellowish brown very fine sandy loam

E/B—23 to 54 inches; light yellowish brown loamy fine sand and reddish brown fine sandy loam

C—54 to 80 inches; light brown, stratified loamy very fine sand to fine sandy loam to very fine sandy loam

Soil Properties and Qualities

Parent material: Wallace—sandy outwash; Alcona—loamy glaciofluvial deposits

Slope: 6 to 15 percent

Hazard of soil blowing: Wallace—severe; Alcona—moderate

Surface runoff class: Wallace—low; Alcona—medium

Potential for frost action: Wallace—low; Alcona—moderate

Depth to restrictive feature: Wallace—8 to 18 inches to ortstein; Alcona—more than 80 inches

Drainage class: Well drained

Available water capacity: Wallace—very low; Alcona—moderate

Shrink-swell potential: Low

Permeability: Wallace—rapid in the upper part, moderate or moderately rapid in the middle part, and rapid in the lower part; Alcona—moderate

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment in areas of the Wallace soil, logging roads should be stabilized.
- In areas of the Alcona soil, skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of the Wallace soil can result in the pollution of ground water.
- In areas of the Wallace soil, the restrictive layer should be broken up or removed in order for the septic tank absorption system to work properly.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: Wallace—6s; Alcona—3e

Michigan soil management group: Wallace—5a-h; Alcona—3a

Habitat type: Wallace—ATD; Alcona—AVO

246B—Garlic sand, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines and outwash plains

Map Unit Composition

Garlic and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions
- The well drained Okeefe soils in landscape positions similar to those of the Garlic soil

Typical Profile

Garlic

Oe—0 to 2 inches; dark brown, moderately decomposed plant material

E—2 to 9 inches; brown sand

Bhs—9 to 11 inches; dark reddish brown sand

Bs—11 to 20 inches; yellowish red sand

BC—20 to 29 inches; yellowish brown and strong brown sand

C—29 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Outwash; glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5.3a

Habitat type: ATD

246D—Garlic sand, 6 to 15 percent slopes

Setting

Landform: Disintegration moraines and outwash plains

Map Unit Composition

Garlic and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Contrasting inclusions:

- The somewhat poorly drained Finch soils in the lower landscape positions
- The well drained Okeefe soils in landscape positions similar to those of the Garlic soil

Typical Profile

Garlic

Oe—0 to 2 inches; dark brown, moderately decomposed plant material

E—2 to 9 inches; brown sand

Bhs—9 to 11 inches; dark reddish brown sand
 Bs—11 to 20 inches; yellowish red sand
 BC—20 to 29 inches; yellowish brown and strong brown sand
 C—29 to 80 inches; light yellowish brown and pale brown sand

Soil Properties and Qualities

Parent material: Outwash; glaciofluvial deposits
Slope: 6 to 15 percent
Hazard of soil blowing: Severe
Surface runoff class: Very low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: Low
Shrink-swell potential: Low
Permeability: Rapid
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.

Septic tank absorption fields

- Land shaping and installing the distribution lines on the contour help to overcome the slope.
- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

Interpretive Groups

Land capability classification: 6s
Michigan soil management group: 5.3a
Habitat type: ATD

286B—Fence silt loam, 0 to 6 percent slopes

Setting

Landform: Till-floored lake plains

Map Unit Composition

Fence and similar soils: 85 to 100 percent
 Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The somewhat poorly drained Annanias soils in the lower landscape positions
- The well drained Sporley soils in landscape positions similar to those of the Fence soil

Typical Profile**Fence**

O_e—0 to 2 inches; moderately decomposed plant material

E—2 to 5 inches; reddish gray silt loam

B_{hs}—5 to 13 inches; dark brown silt loam

B/E—13 to 23 inches; reddish brown and reddish gray, mottled silt loam

B_t—23 to 33 inches; reddish brown silt loam

C—33 to 80 inches; light reddish brown silt loam

Soil Properties and Qualities

Parent material: Glaciofluvial deposits

Slope: 0 to 6 percent

Hazard of soil blowing: Slight

Surface runoff class: Moderate

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: High

Shrink-swell potential: Low

Permeability: Moderately slow

Flooding: None

Depth to seasonal high water table: 1.5 feet (March, April, May, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- Backfilling the trench with porous material helps to compensate for the restricted permeability.
- Enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 2e

Michigan soil management group: 3a

Habitat type: ATD

287B—Noseum fine sandy loam, 0 to 4 percent slopes

Setting

Landform: Outwash terraces

Map Unit Composition

Noseum and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Contrasting inclusions:

- The moderately well drained Paquin and Bodi soils in landscape positions similar to those of the Noseum soil

Typical Profile

Noseum

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 5 inches; brown fine sandy loam

Bhs—5 to 7 inches; dark brown fine sandy loam

Bs1—7 to 19 inches; brown fine sandy loam

Bs2—19 to 27 inches; strong brown sand

BC—27 to 39 inches; reddish yellow sand

C—39 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Parent material: Outwash

Slope: 0 to 4 percent

Hazard of soil blowing: Moderate

Surface runoff class: Very low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderately rapid in the upper part and rapid in the lower part

Flooding: None

Depth to seasonal high water table: 2 feet (April, May)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- Skidders should not be used during wet periods, when ruts form easily. Year-round logging roads may require a gravel base.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

Septic tank absorption fields

- The poor filtering capacity of this soil can result in the pollution of ground water.
- On large lots, an absorption system of shallow trenches with shrubbery planted around the perimeter and low, uniform application rates help to minimize the risk of ground-water pollution.

- Filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 5a

Habitat type: ATD

300—Beaches

Setting

Landform: Beaches

Map Unit Composition

Beaches: 100 percent

Use and Management

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

Interpretive Groups

Land capability classification: None assigned

Michigan soil management group: None assigned

Habitat type: None assigned

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 all 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, under natural conditions, 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, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2003) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

- 22—Spot peat
- 23—Leafriver mucky peat
- 30—Kinross muck
- 35—Histosols and Aquent, ponded
- 36—Carbondale, Lupton, and Tawas soils
- 37—Dawson, Greenwood, and Loxley soils
- 102—Spot-Dawson peats
- 126—Pickford silt loam
- 133—Dorval muck
- 143—Caffey muck
- 188—Hendrie mucky peat
- 204—Gogomain muck
- 212—Markey mucky peat

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 following map units, 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. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

- 45D—Rubicon-Spot complex, 0 to 15 percent slopes
- 45E—Rubicon-Spot complex, 0 to 35 percent slopes
- 60A—Kinross-Au Gres complex, 0 to 3 percent slopes
- 89A—Spot-Finch complex, 0 to 3 percent slopes
- 90D—Rousseau-Spot complex, 0 to 15 percent slopes
- 90E—Rousseau-Spot complex, 0 to 35 percent slopes
- 90F—Rousseau-Spot complex, 0 to 60 percent slopes
- 93F—Ontonagon-Pickford, occasionally flooded, complex, 0 to 50 percent slopes
- 94A—Tawas-Spot-Finch complex, 0 to 3 percent slopes
- 109D—Rousseau-Dawson complex, 0 to 15 percent slopes
- 109F—Rousseau-Dawson complex, 0 to 60 percent slopes
- 110D—Au Gres-Dawson-Rubicon complex, 0 to 15 percent slopes
- 110E—Au Gres-Dawson-Rubicon complex, 0 to 35 percent slopes
- 130A—Rudyard-Pickford silt loams, 0 to 3 percent slopes
- 146A—Allendale-Fibre complex, 0 to 3 percent slopes
- 174B—Croswell-Spot complex, 0 to 6 percent slopes
- 175D—Wallace-Spot complex, 0 to 15 percent slopes
- 175E—Wallace-Spot complex, 0 to 35 percent slopes
- 176B—Paquin-Spot complex, 0 to 6 percent slopes
- 194A—Hendrie-Annianias complex, 0 to 3 percent slopes
- 201B—Croswell, rarely flooded-Deford, frequently flooded, complex, 0 to 6 percent slopes
- 214D—Rousseau-Markey complex, 0 to 15 percent slopes
- 214E—Rousseau-Markey complex, 0 to 35 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; 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.

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*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *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.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. Prime farmland is described, the estimated yields of the main crops and pasture plants are listed, and the system of land capability classification used by the Natural Resources Conservation Service is explained.

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

In 1992, about 6,000 acres in Luce County was farmed. The major crops are hay, small grains, and irrigated potatoes (fig. 8). The potential for many of the soils is excellent if proper management is applied. Farm management practices needed for cropland include controlling water erosion and soil blowing, improving soil fertility, preventing surface compaction, and improving drainage.

Water erosion is a management concern on the undulating to rolling soils in the county, such as Trenary and McMillan soils. Erosion of the surface layer reduces productivity through the loss of topsoil and soil nutrients. Livestock may cause erosion along the banks of ditches or streams as a result of overgrazing. A system of conservation tillage that leaves a protective cover of crop residue on the surface helps to control surface runoff and erosion. Diversions, surface drains, grade-stabilization structures, and grassed waterways help to prevent gully erosion caused by concentrated runoff.

Soil blowing is a hazard in areas of Kalkaska loamy sand. A dry, bare surface is very susceptible to soil blowing. A permanent plant cover, windbreaks of trees or shrubs, surface mulch, spring plowing, or a system of conservation tillage helps to control soil blowing.

Soil fertility is naturally high or medium in the finer textured soils and low in the sandy soils. Most of the farmland soils in Luce County are acid and need additions of ground limestone to raise the pH to the optimum level of 6.5. At this pH level, most nutrients are readily available for plant growth. Additions of lime and fertilizer should be based on the results of soil tests. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime needed (Michigan State University, 1985).

Surface compaction is a management concern on clayey soils, such as Pickford and Rudyard soils. Excessive cultivation and working the soil when it is wet can result in compaction. Allowing livestock to graze on these soils during wet periods also results in compaction and can retard the growth of pasture plants. Poor seedling emergence, lower water infiltration rates, restricted rooting depth, and reduced crop yields may result. Conservation tillage, rotation grazing, and additions of organic material help to prevent surface compaction.

Soil wetness is the major concern in areas of Pickford and Rudyard soils. Improving soil drainage can increase crop production and the timeliness of fieldwork. Fieldwork is restricted when the soils are wet. Improving surface drainage and lowering the perched seasonal high water table allow earlier spring planting and extend the harvest season.



Figure 8.—Certified seed potatoes grown under irrigation in an area of Kalkaska loamy sand, 0 to 6 percent slopes. Soil blowing is a hazard. Planting rye or other cover crops can reduce the hazard of soil blowing.

Pasture

In 1992, the county had about 4,500 acres of pasture. Pastures should be topdressed every other year according to the results of soil tests. Clipping the pasture results in more uniform regrowth and controls weeds. A proper seeding mixture of pasture plants increases forage production.

More specific information about seeding mixtures and seeding times is available at the local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

The productivity of a pasture and its ability to protect the surface of the soil are influenced by the number of livestock that the pasture supports, the length of time that they graze, and the distribution of rainfall. Good pasture management includes stocking rates that maintain the desired forage species, pasture rotation, deferred grazing, and restricted grazing during wet and extremely dry periods.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is

limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

About 5,920 acres, or nearly 1 percent of the survey area, meets the requirements for prime farmland. Areas of Trenchy fine sandy loam, 2 to 6 percent slopes, are the only areas of prime farmland that are being farmed. These areas are in Lakefield Township.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland 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, forestland, 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, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, 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, rangeland, forestland, 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 capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table. It is also given under the heading "Interpretive Groups."

Also under the heading "Interpretive Groups" and in each map unit description, the Michigan soil management group is listed. The soils in each map unit are assigned to a group according to the dominant texture, the drainage class, and the major management concerns (Mokma, 1982). More detailed information about these groups is available from the local office of the Michigan State University Cooperative Extension Service.

Woodland Management and Productivity

Woodland is the major land use in Luce County. It makes up about 95 percent of the county, or about 550,000 acres. State agencies manage about 214,000 acres of the woodland. The remaining 336,000 acres is managed by forest industry companies and private landowners.

Productivity was measured on several of the major soil series in the county. The site index was determined using at least five trees per site. Thirty site indices were done on 25 different soil series (USDA/NRCS, National Forestry Manual).

The sandy upland soils in the county, which make up about 268,000 acres, support stands of red pine, white pine, jack pine, and aspen or sugar maple and American beech (fig. 9). The loamy upland soils in the county, which make up about 47,500 acres, support stands of sugar maple, American beech, and aspen. The large muck areas, which make up about 165,700 acres, support stands of northern whitecedar, tamarack, and black spruce. The wetter mineral soils, which make up about 65,000 acres, support stands of balsam fir, white spruce, aspen, and red maple. Forest management assistance is available from the local Conservation District, the Michigan Department of Natural Resources, or private forestry consultants.

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.

In table 7, 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 provided 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.



Figure 9.—A planted windbreak in an area of Kalkaska loamy sand, 0 to 6 percent slopes. This north-south planting is a living snow fence that minimizes the drifting of snow across the taxiway at the Luce County airport.

Suggested trees to plant are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices in table 7. 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.

Ratings in the column *erosion hazard* are based on the soil erosion factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

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. *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. *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. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

The column *windthrow hazard* rates the likelihood that trees will be uprooted by wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Ratings in the column *potential for 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.

Table 8 provides expanded information concerning the operability of harvesting equipment. The table gives information about operating harvesting or thinning equipment in logging areas and on skid roads, log landings, and haul roads. Limitations are given for the most limiting season and for the preferred operating season. The most limiting season in this survey area generally is spring or late fall. In some areas, however, it is during dry periods in summer, when loose sand can limit trafficability on deep, excessively drained, sandy soils.

The preferred operating season is the period when harvesting or thinning causes the least amount of soil damage. This period generally is when the soil is not too wet or when the ground is frozen or partly frozen or has an adequate snow cover.

For limitations affecting construction of haul roads, the ratings are based on slope, flooding, 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 soils are described as well suited, moderately suited, or poorly suited to use as haul roads. A rating of *well suited* indicates that no significant limitations affect construction activities, *moderately suited* indicates that one or more limitations can cause some difficulty in construction, and *poorly suited* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of suitability for log landings 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 soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings for logging areas and skid roads 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 suited, or poorly suited to this use.

Forest Habitat Types

The information in this section is derived from a field guide developed for the Upper Peninsula of Michigan and for northeastern Wisconsin (Coffman and others, 1980). The system of habitat classification used in the guide is based on the concept that plants occur in predictable patterns or communities and that these communities reflect differences in site characteristics.

Besides identifying the various habitat types by means of vegetative keys, the guide also provides information about the different possible successional stages for most of the habitat types. The successional stages depend largely on how the forest has been

disturbed. They include the succession after logging in the original climax stands, the succession after logging in second-growth stands, and the succession in stands that have been both logged and burned.

The guide gives the suggested forest management for each of the successional stages. This management includes methods of thinning and harvest, site preparation, and measures that improve regeneration of the stands. The potential productivity, in terms of a site index and the mean annual volume in cubic feet per acre per year, is given for most of the habitat types. The development of the descriptive or interpretive information for some of the habitat types, however, is based on limited data and thus should be used with caution.

Habitat types have been determined for each map unit in the survey area. The primary habitat type is the one that is most common for the map unit. The secondary habitat type is less common. Habitat types are given at the end of the descriptions in the section "Detailed Soil Map Units." They also are specified in the section "Interpretive Groups," which follows the tables at the back of this survey.

The following paragraphs describe the habitat types in the survey area. They provide information about the potential climax species, some of the common understory species, and, if known, the potential productivity of the habitat type.

AOC—Acer-Osmorhiza-Caulophyllum habitat type. This habitat type has a potential climax overstory dominated by sugar maple. Other species include eastern hemlock and American basswood. American elm, white ash, and eastern hophornbeam are in some areas. The dominant ground flora includes spinulose woodfern, blue cohosh, sweet cicely, common ladyfern, yellow violet, Canada white violet, and downy violet. The potential productivity for northern hardwoods is high.

AQVac—Acer-Quercus-Vaccinium habitat type. This habitat type has a potential climax overstory dominated by red maple and red oak. Other species include eastern hemlock, white pine, balsam fir, and white spruce. The dominant ground flora includes lowbush blueberry, Canada blueberry, brackenfern, wintergreen, bigleaf aster, and hazelnut. The potential productivity is moderately low for northern hardwoods, moderate for aspen, and moderately high for red pine and jack pine.

AQVib—Acer-Quercus-Viburnum habitat type. This habitat type has a potential climax overstory dominated by red maple and red oak. Other species include American beech, sugar maple, white ash, and American basswood. The dominant ground flora includes mapleleaf viburnum, witchhazel, trefoil tickclover, brackenfern, and hazelnut. The potential productivity is moderately high for northern hardwoods and high for aspen and red pine.

ATD—Acer-Tsuga-Dryopteris habitat type. This habitat type has a potential climax overstory dominated by sugar maple. Other species include eastern hemlock and American basswood. Yellow birch, red maple, and American elm are in some areas. The dominant ground flora includes spinulose woodfern, twistedstalk, hairy Solomons seal, scarlet alder, and Canada mayflower. The potential productivity is moderately high for northern hardwoods and high for aspen. The potential productivity for red pine plantations is high if plant competition is controlled.

ATD-CI—Acer-Tsuga-Dryopteris habitat type, Circaea-Impatiens phase. This habitat type has a potential climax overstory dominated by sugar maple. Other species include eastern hemlock and American basswood. Yellow birch, red maple, and American elm are in some areas. The dominant ground flora includes spinulose woodfern, rosy twistedstalk, Solomons seal, scarlet elder, Canada mayflower, jewelweed, and alpine circaea. The potential productivity is moderately high for northern hardwoods and high for aspen. The potential productivity for red pine plantations is high if plant competition is controlled.

AVO—Acer-Viola-Osmorhiza habitat type. This habitat type has a potential climax overstory dominated by sugar maple. Other species include eastern hemlock, American basswood, white ash, yellow birch, eastern hophornbeam, eastern hemlock,

and American elm. The dominant ground flora includes Canada white violet, sweet cicely, spinulose woodfern, common ladyfern, hairy Solomons seal, and rosy twistedstalk. The potential productivity is high for northern hardwoods and aspen. It also is high for red pine plantations if plant competition is controlled.

AVO-A—Acer-Viola-Osmorhiza habitat type, Adiantum phase. This habitat type has a potential climax overstory dominated by sugar maple. Other species include American basswood, white ash, yellow birch, eastern hophornbeam, eastern hemlock, and American elm. The dominant ground flora includes Canada white violet, sweet cicely, spinulose woodfern, wild leek, maidenhair fern, ladyfern, Solomons seal, and rosy twistedstalk. The potential productivity is high for northern hardwoods and aspen. It also is high for red pine plantations if plant competition is controlled.

AVO-CI—Acer-Viola-Osmorhiza habitat type, Circaea-Impatiens phase. This habitat type has a potential climax overstory dominated by sugar maple. Other species include American basswood, white ash, yellow birch, eastern hophornbeam, eastern hemlock, and American elm. The dominant ground flora includes Canada white violet, sweet cicely, spinulose woodfern, ladyfern, Solomons seal, rosy twistedstalk, jewelweed, and alpine circaea. The potential productivity is high for northern hardwoods and aspen. It is high for red pine plantations if plant competition is controlled.

FE—Fraxinus-Eupatorium habitat type. This habitat type has a potential climax overstory dominated by black ash and American elm. Other species include red maple, balsam fir, and white ash. The dominant ground flora consists of sedge, speckled alder, northern dewberry, boneset, spotted joe-pye weed, and water hemlock.

FI—Fraxinus-Impatiens habitat type. This habitat type has a potential climax overstory dominated by white ash and red maple. Other species include sugar maple, black ash, and balsam fir. The dominant ground flora consists of spotted touchmenot, sedge, alpine circaea, spinulose woodfern, common ladyfern, scarlet alder, and field mint. The potential productivity for northern hardwoods is moderate.

FMC—Fraxinus-Mentha-Carex habitat type. This habitat type has a potential climax overstory dominated by black ash and American elm. Other species include red maple and balsam fir. The dominant ground flora consists of sedge, field mint, speckled alder, and spotted touchmenot.

PCS—Picea-Chamadaphne-Sphagnum habitat type. This habitat type has a potential climax overstory dominated by black spruce. Other species include tamarack and northern whitecedar. The dominant ground flora consists of leatherleaf, bog rosemary, pale laurel, sphagnum, Labrador tea, sedge, and Canada blueberry.

PVC—Pinus-Vaccinium-Carex habitat type. This habitat type has a potential climax overstory dominated by jack pine. Other species include red pine, black spruce, and white pine. The dominant ground flora consists of sedge, low sweet blueberry, sweet fern, juneberry, Canada mayflower, and spinulose woodfern.

PVD—Pinus-Vaccinium-Deschampsia habitat type. This habitat type has a potential climax overstory dominated by jack pine. Other species include red pine and white pine. The dominant ground flora consists of hairgrass, sedge, reindeer moss, sweet fern, lowbush blueberry, brackenfern, and trailing arbutus. The potential productivity is moderately low for red pine and moderate for jack pine.

QAE—Quercus-Acer-Epigea habitat type. This habitat type has a potential climax overstory dominated by red oak and red maple. Other species include white spruce and white pine. The dominant ground flora consists of brackenfern, trailing arbutus, wintergreen, lowbush blueberry, mosses, and Canada blueberry. The potential productivity is moderately low for aspen and moderate for red pine and jack pine.

TAM—Tsuga-Acer-Mitchella habitat type. This habitat type has a potential climax overstory dominated by sugar maple and eastern hemlock. Other species include red maple, American basswood, white ash, and yellow birch. The dominant ground flora

consists of sedge, wild sarsaparilla, partridgeberry, horsetail, bigleaf aster, Canada mayflower, ladyfern, American fly honeysuckle, rosy twistedstalk, and northern dewberry. The potential productivity is moderately low for northern hardwoods and moderate for aspen.

TAM-Eq—Tsuga-Acer-Mitchella habitat type, Equisetum phase. This habitat type has a potential climax overstory dominated by sugar maple and eastern hemlock. Other species includes black ash, American elm, red maple, American basswood, white ash, and yellow birch. The dominant ground flora consists of sedge, wild sarsaparilla, partridgeberry, horsetail, bigleaf aster, Canada mayflower, ladyfern, American fly honeysuckle, rosy twistedstalk, and northern dewberry. The potential productivity is moderately low for northern hardwoods and moderate for aspen.

TM—Tsuga-Maianthemum habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock, sugar maple, and red maple. Other species include yellow birch, white spruce, balsam fir, white pine, red oak, northern whitecedar, and American basswood. The dominant ground flora includes Canada mayflower, brackenfern, sedge, American starflower, and wild sarsaparilla. The potential productivity is moderate for northern hardwoods, moderately high for aspen, and high for red pine and jack pine.

TMC—Tsuga-Maianthemum-Coptis habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock and red maple. Sugar maple and yellow birch are common. Balsam fir, white spruce, and northern whitecedar are in some stands. The dominant ground flora consists of Canada mayflower, goldthread, yellow beadleily, bunchberry dogwood, American starflower, and spinulose woodfern. The potential productivity for northern hardwoods is moderate.

TMC-D—Tsuga-Maianthemum-Coptis habitat type, Dryopteris phase. This habitat type has a potential climax overstory dominated by eastern hemlock and red maple. Sugar maple and yellow birch are common. Other species include balsam fir, white spruce, and northern whitecedar. The dominant ground flora consists of Canada mayflower, goldthread, yellow beadleily, bunchberry dogwood, American starflower, spinulose woodfern, long beechfern, oakfern, and Solomons seal. The potential productivity is moderate for northern hardwoods and aspen.

TMC-Vac—Tsuga-Maianthemum-Coptis habitat type, Vaccinium phase. This habitat type has a potential climax overstory dominated by eastern hemlock and red maple. Sugar maple and yellow birch are common. Other species include balsam fir, white spruce, and northern whitecedar. The dominant ground flora consists of Canada mayflower, goldthread, yellow beadleily, bunchberry dogwood, American starflower, Canada blueberry, lowbush blueberry, and spinulose woodfern. The potential productivity is moderate for northern hardwoods and aspen.

TMV—Tsuga-Maianthemum-Vaccinium habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock and red maple. Other species include sugar maple, white pine, balsam fir, and white spruce. Red oak is in some stands. The dominant ground flora includes Canada blueberry, wild sarsaparilla, brackenfern, Canada mayflower, lowbush blueberry, yellow beadleily, and wood betony. The potential productivity is moderate for northern hardwoods, moderately high for aspen, and high for red pine and jack pine.

TTL—Tsuga-Thuja-Lonicera habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock and northern whitecedar. Other species include red maple, sugar maple, balsam fir, and eastern white pine. The dominant ground flora includes bigleaf aster, sedge, American fly honeysuckle, Canada mayflower, and spinulose woodfern. The potential productivity is moderately low for northern hardwoods, high for aspen, and moderate for red pine.

TTM—Tsuga-Thuja-Mitella habitat type. This habitat type has a potential climax overstory dominated by northern whitecedar and eastern hemlock. Other species include balsam fir and red maple. The dominant ground flora includes sphagnum,

naked miterwort, twinflower, goldthread, bunchberry dogwood, sedge, Canada mayflower, American starflower, and fringed polygala.

TTP—Tsuga-Thuja-Petasties habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock and northern whitecedar. Other species include balsam fir, red maple, and sugar maple. The dominant ground flora includes palmate-leaved sweet coltsfoot, bigleaf aster, sedge, barren strawberry, sarsaparilla, and black snakeroot. The potential productivity is moderately low for aspen.

TTS—Tsuga-Thuja-Sphagnum habitat type. This habitat type has a potential climax overstory dominated by eastern hemlock and northern whitecedar. Other species include balsam fir and black spruce. Red maple is in some stands. The dominant ground flora includes sphagnum, goldthread, bunchberry dogwood, sedge, Canada mayflower, American starflower, and wood sorrel.

Recreation

The soils of the survey area are rated in tables 9a and 9b 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. *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, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 9a and 9b 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

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, orchardgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, ferns, clubmoss, and cattails.

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, apple, beech, dogwood, and hazelnut. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, blueberry, 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, and cedar.

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, wild rice, 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 sandhill cranes, sharptail grouse, meadowlark, marsh hawk, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

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 onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about 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 onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

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. Construction activities on building sites may be regulated by local, State, and Federal laws. All necessary permits should be obtained before construction begins. Questions about management practices and solutions relating to the various soil concerns affecting building should be referred to the appropriate local permitting or regulatory officials.

Tables 11a and 11b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, and shallow excavations.

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. *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.

Sanitary Facilities

The construction of sanitary facilities may be regulated by local, State, and Federal laws. All necessary permits should be obtained before construction begins. Questions relating to management practices and solutions applicable to the soil concerns affecting sanitary facilities should be referred to the appropriate local permitting official, health department, building and zoning office, or regulatory officials.

Tables 12a and 12b 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. *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, onsite 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 soil blowing.

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.

Construction Materials

Tables 13a and 13b give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* 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 13a, 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. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good 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 reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, or topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

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).

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.

Water Management

Tables 14a and 14b give 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; aquifer-fed excavated ponds; grassed waterways; and drainage. 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. *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).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a non erosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, or to other layers that affect the rate of water movement; permeability; depth to a zone in which the soil moisture status is wet or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts. Availability of drainage outlets is not considered in the ratings.

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.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 15 gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

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 oven-dry 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.

Physical Properties

Table 16 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, 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 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 (oven-dry) 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.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $1/3$ - or $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Erosion factors are shown in table 16 as the K factor (K 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 several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor 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 described in the "National Soil Survey Handbook" (USDA, NRCS).

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 17 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

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 17, 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.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Soil Features

Table 18 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel

or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Soil moisture status is an estimate of the fluctuating water content in a soil. It greatly influences vegetation type and plant growth; physical properties of soils, such as permeability, workability, strength, linear extensibility, and frost action; and chemical interactions and transport. Many other properties, qualities, and interpretations also are affected. Soil moisture status is important in the classification of soils, wetland, and habitat.

Table 19 gives estimates of soil moisture for each component of a map unit at various depths for every month of the year. The depths displayed are representative values that are indicative of conditions that occur most commonly. These representative values of dry, moist, and wet can vary greatly from month to month and from year to year. *Dry* indicates a moisture condition under which most plants (especially crops) cannot extract water for growth. *Moist* indicates a moisture condition under which soil water is most readily available for plant growth. *Wet* indicates a condition under which water will stand in an unlined hole or at least a condition under which the soil is too wet for the growth of most agricultural species. A moisture status of 4.0-6.7 (wet) indicates that most of the time the component is saturated at some depth between 4.0 feet and 6.7 feet during the month designated. In some years the soil may be saturated at a depth of less than 4.0 feet or more than 6.7 feet; however, field observations indicate that the soil will be saturated between these depths in most years. In the summer, the soil may show the effects of drying plus intermittent rains that result in a moist or wet layer over a dry layer that gets moist or wet again.

Table 20 gives estimates of additional 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 20 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

The table also shows the *kind of water table*, that is, perched or apparent. 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.

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 20 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Characterization Data for Selected Soils

Some of the major soils in Luce County were sampled by the Soil Survey Laboratory at the National Soil Survey Center in Lincoln, Nebraska. The laboratory data obtained from the soil samples included analyses of particle-size distribution, rock fragments, bulk density, and moisture retention. Complete chemical analyses also were performed on each sample, and spodic horizon criteria were tested on the appropriate samples. Standard procedures of the National Cooperative Soil Survey were used for all analyses (USDA/NRCS, 2004).

These data were used in classifying and correlating the soils and in evaluating their behavior, especially under forestry uses. Nine pedons were selected as representative of the respective series. These series and their laboratory identification numbers are as follows: Auger (S97MI-095-036), Annanias (S02MI-095-002), Bodi (S97MI-095-031), Dillingham (S01MI-095-002), Kaks (S01MI-095-001), McMillan (S01MI-095-003), Okeefe (S97MI-095-022), Sporley (S98MI-095-008), and Zandi (S97MI-095-029). The data can be accessed at the lab data Web site (<http://soils.usda.gov>).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 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. An example is Aquic 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 class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy, mixed, active, frigid Aquic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows

standards in the “Soil Survey Manual” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. More information about the soil series in Luce County, including the range of important characteristics of the soils in the series, is available in the Official Soil Series Descriptions (OSDs) at <http://soils.usda.gov>.

Alcona Series

The Alcona series consists of very deep, well drained soils on lake plains and ground moraines. These soils formed in stratified loamy glaciofluvial deposits. Permeability is moderate. Slopes range from 0 to 70 percent.

Typical pedon of Alcona fine sandy loam, on a slope of 42 percent; in an area of Wallace-Alcona complex, 1,450 feet east and 2,300 feet north of the southwest corner of sec. 17, T. 42 N., R. 5 W., in Mackinac County, Michigan:

Oe—0 to 1 inch; partially decomposed leaf litter.

E—1 to 3 inches; pinkish gray (7.5YR 6/2) fine sandy loam, pinkish gray (7.5YR 7/2) dry; weak fine subangular blocky structure; friable; many fine to coarse roots; about 1 percent gravel; strongly acid; clear smooth boundary.

Bs1—3 to 6 inches; dark brown (7.5YR 3/4) fine sandy loam; weak fine subangular blocky structure; friable; many fine to coarse roots; about 1 percent gravel; strongly acid; clear smooth boundary.

Bs2—6 to 9 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; many fine to coarse roots; about 1 percent gravel; moderately acid; clear wavy boundary.

Bs3—9 to 17 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; many fine to coarse roots; about 1 percent gravel; moderately acid; clear wavy boundary.

B/E—17 to 23 inches; about 65 percent reddish brown (5YR 5/4) very fine sandy loam (Bt); few faint dark brown (7.5YR 4/4) clay films on faces of peds; surrounded by tongues of light pinkish gray (7.5YR 6/2) very fine sandy loam (E), pinkish gray (7.5YR 7/2) dry; moderate medium subangular blocky structure; firm; common fine and medium roots; about 1 percent gravel; moderately acid; clear wavy boundary.

E/B—23 to 54 inches; about 70 percent light reddish brown (5YR 6/3) loamy fine sand (E), pinkish gray (7.5YR 7/2) dry; surrounding peds of reddish brown (5YR 5/4) fine sandy loam (Bt); few faint reddish brown (5YR 5/4) clay flows on faces of peds; weak coarse subangular blocky structure; friable; common fine vesicular pores; few fine and medium roots; about 1 percent gravel; slightly acid; gradual wavy boundary.

C—54 to 80 inches; light brown (7.5YR 6/4) and brown (7.5YR 5/4), stratified loamy very fine sand, fine sandy loam, and very fine sandy loam; massive; friable; few fine and medium roots; about 1 percent gravel; slightly effervescent; moderately alkaline.

Allendale Series

The Allendale series consists of very deep, somewhat poorly drained soils on lake plains, outwash plains, and ground moraines. These soils formed in sandy sediments and in the underlying clayey lacustrine or till deposits. Permeability is rapid in the upper sandy part and very slow in the lower clayey part. Slopes range from 0 to 3 percent.

Typical pedon of Allendale loamy fine sand, 0 to 3 percent slopes, 540 feet east and 640 feet south of the northwest corner of sec. 20, T. 43 N., R. 2 W., in Chippewa County, Michigan:

Ap—0 to 5 inches; black (10YR 2/1) loamy fine sand, dark gray (10YR 5/1) dry; weak medium granular structure; very friable; many fine to coarse roots; moderately acid; clear smooth boundary.

E—5 to 8 inches; pinkish gray (7.5YR 6/2) fine sand, pinkish gray (7.5YR 7/2) dry; weak medium subangular blocky structure; very friable; many fine and medium roots; moderately acid; clear irregular boundary.

Bhs—8 to 10 inches; dark reddish brown (5YR 3/3) loamy fine sand; weak medium subangular blocky structure; very friable; many fine and medium roots; ortstein makes up 10 percent of the horizon and occurs as weakly cemented chunks; moderately acid; clear irregular boundary.

Bs1—10 to 15 inches; strong brown (7.5YR 4/6) fine sand; moderate medium subangular blocky structure; very friable; common fine roots; common medium distinct yellowish red (5YR 4/6) iron accumulations; slightly acid; clear wavy boundary.

Bs2—15 to 31 inches; yellowish brown (10YR 5/6) fine sand; moderate medium subangular blocky structure; very friable; common fine roots; many coarse prominent strong brown (7.5YR 5/8) and medium prominent yellowish red (5YR 5/8) iron accumulations; neutral; abrupt smooth boundary.

2Bt—31 to 35 inches; reddish brown (5YR 5/4) silty clay; many faint reddish brown (5YR 4/4) clay flows on faces of peds and in root channels; weak coarse subangular blocky structure; firm; many medium distinct yellowish red (5YR 5/8) and prominent light olive brown (2.5Y 5/6) iron accumulations; many fine prominent light greenish gray (5G 7/1) and grayish green (5GY 6/1) iron depletions; slight effervescence; slightly alkaline; clear smooth boundary.

2C—35 to 80 inches; light reddish brown (5YR 6/3) silty clay with thin strata of yellowish brown (10YR 5/4) silty clay loam and silt loam; massive; firm; many coarse distinct pinkish gray (7.5YR 6/2) and few fine prominent light greenish gray (5G 7/1) iron depletions; common medium prominent strong brown (7.5YR 5/8) and red (2.5YR 5/6) iron accumulations; strongly effervescent; moderately alkaline.

Amadon Series

The Amadon series consists of shallow, well drained soils on bedrock-controlled ground moraines and bedrock benches. These soils formed in loamy glacial till deposits overlying limestone bedrock. Permeability is moderate. Slopes range from 0 to 45 percent.

Typical pedon of Amadon sandy loam, on a slope of 1 percent; in an area of Amadon-Longrie complex, 1,800 feet south and 50 feet east of the northwest corner of sec. 27, T. 42 N., R. 11 W., in Mackinac County, Michigan:

Oe—0 to 2 inches; partially decomposed leaf litter.

E—2 to 8 inches; pinkish gray (7.5YR 6/2) sandy loam, pinkish gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; many fine to coarse roots; about 2 percent gravel; moderately acid; clear smooth boundary.

Bhs—8 to 10 inches; dark reddish brown (5YR 3/2) fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; about 2 percent gravel; moderately acid; clear smooth boundary.

Bs—10 to 15 inches; dark brown (7.5YR 3/4) fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; about 2 percent gravel; moderately acid; clear smooth boundary.

2R—15 inches; fractured, hard limestone bedrock.

Annaias Series

The Annaias series consists of very deep, somewhat poorly drained soils on lake plains. These soils formed in loamy glaciolacustrine deposits. Permeability is moderate. Slopes range from 0 to 3 percent.

Typical pedon of Annaias silt loam, 250 feet west and 800 feet south of the northeast corner of sec. 20, T. 48 N., R. 8 W., in Luce County, Michigan:

Oa—0 to 4 inches; black (7.5YR 2/1), well decomposed leaf litter; moderate medium granular structure; friable; many fine to coarse roots; extremely acid; clear wavy boundary.

E—4 to 7 inches; pinkish gray (7.5YR 6/2) silt loam, pinkish gray (7.5YR 7/2) dry; moderate fine subangular blocky structure; friable; common fine to coarse roots; extremely acid; abrupt wavy boundary.

Bhs—7 to 10 inches; dark brown (7.5YR 3/3) silt loam; moderate fine subangular blocky structure; friable; many fine to coarse roots; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation; extremely acid; clear wavy boundary.

Bs—10 to 15 inches; brown (7.5YR 4/4) silt loam; moderate fine and medium subangular blocky structure; friable; common fine to coarse roots; few fine faint strong brown (7.5YR 4/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

BC—15 to 26 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine and medium roots; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

C1—26 to 47 inches; brown (7.5YR 5/4), reddish brown (5YR 5/4), and pale brown (10YR 6/3), stratified silt loam and very fine sandy loam; massive or weak medium platy structure; friable; common fine to coarse vesicular and tubular pores; few thin ($\frac{1}{8}$ inch) dark gray (7.5YR 4/1) organic stains; common coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; gradual smooth boundary.

C2—47 to 80 inches; brown (7.5YR 5/3), reddish brown (5YR 5/4), and light brownish gray (10YR 6/2), stratified silt loam and silt; massive or weak medium platy structure inherent from deposition; friable; common fine to coarse vesicular and tubular pores; common coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid.

Au Gres Series

The Au Gres series consists of very deep, somewhat poorly drained soils on ground moraines, lake plains, and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 3 percent.

Typical pedon of Au Gres sand, on a slope of 1 percent, 2,000 feet east and 400 feet south of the northwest corner of sec. 28, T. 49 N., R. 8 W., in Luce County, Michigan:

Oe—0 to 2 inches; dark brown (7.5YR 3/3), partially decomposed leaf litter; massive; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.

E—2 to 7 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak

- medium subangular blocky structure; friable; common fine to coarse roots; extremely acid; abrupt wavy boundary.
- Bs1—7 to 12 inches; 90 percent strong brown (7.5YR 4/6) and 10 percent dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; friable; many fine to coarse roots; ortstein makes up 10 percent of the horizon and is moderately cemented; ortstein occurs as dark brown (7.5YR 3/4) tongues 2 to 4 inches wide extending to a depth of 15 inches; few fine faint strong brown (7.5YR 5/6) masses of iron accumulation; extremely acid; clear wavy boundary.
- Bs2—12 to 17 inches; strong brown (7.5YR 5/6) sand; weak medium subangular blocky structure; friable; few fine to coarse roots; ortstein makes up 25 percent of the horizon and is moderately cemented; ortstein occurs as strong brown (7.5YR 5/6) and dark brown (7.5YR 3/4) tongues 1 to 4 inches wide extending to a depth of 24 inches; common fine distinct yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.
- BC—17 to 28 inches; brown (7.5YR 5/4) sand; weak medium subangular blocky structure; friable; common fine faint strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.
- C1—28 to 52 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; strongly acid; clear wavy boundary.
- C2—52 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid.

Auger Series

The Auger series consists of very deep, moderately well drained soils on lake plains. These soils formed in loamy glaciolacustrine deposits. Permeability is moderate. Slopes range from 0 to 6 percent.

Typical pedon of Auger silt loam, on a slope of 3 percent, 650 feet north of the southeast corner of sec. 17, T. 48 N., R. 8 W., in Luce County, Michigan:

- Oe—0 to 2 inches; partially decomposed leaf litter; weak medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- E—2 to 5 inches; brown (7.5YR 5/2) silt loam, pinkish gray (7.5YR 7/2) dry; moderate medium subangular blocky structure; friable; common fine to coarse roots; common charcoal fragments; extremely acid; abrupt irregular boundary.
- Bhs—5 to 6 inches; black (5YR 2.5/1) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; few charcoal fragments; extremely acid; abrupt irregular boundary.
- Bs1—6 to 11 inches; mixed dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; few charcoal fragments; extremely acid; clear irregular boundary.
- Bs2—11 to 15 inches; mixed yellowish red (5YR 4/6 and 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine to coarse roots; very strongly acid; clear wavy boundary.
- BC—15 to 25 inches; brown (7.5YR 5/4) very fine sandy loam; moderate medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear wavy boundary.
- C1—25 to 63 inches; pale brown (10YR 6/3), light yellowish brown (10YR 6/4), and brown (7.5YR 5/4), stratified silt loam and silt; weak thick platy structure inherent from deposition; friable; common medium distinct strong brown (7.5YR 5/6 and 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

C2—63 to 80 inches; brown (7.5YR 5/3 and 5/4) silt; weak thick platy structure inherent from deposition; friable; common medium and coarse prominent yellowish red (5YR 5/6 and 5/8) masses of iron accumulation; very strongly acid.

Battydoe Series

The Battydoe series consists of very deep, well drained soils on ground moraines and drumlins. These soils formed in loamy glacial till deposits. Permeability is moderate. Slopes range from 1 to 35 percent.

Typical pedon of Battydoe fine sandy loam, on a slope of 1 percent, 1,200 feet south and 175 feet west of the northeast corner of sec. 28, T. 42 N., R. 11 W., in Mackinac County, Michigan:

Oe—0 to 1 inch; black (5YR 2/1), partially decomposed leaf litter.

A—1 to 3 inches; black (5YR 2/1) fine sandy loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; many fine to coarse roots; about 3 percent gravel and 10 percent cobbles; strongly acid; abrupt smooth boundary.

E—3 to 5 inches; reddish gray (5YR 5/2) loamy sand, light gray (5YR 6/1) dry; moderate medium and fine subangular blocky structure; friable; common fine to coarse roots; about 3 percent gravel and 10 percent cobbles; strongly acid; abrupt irregular boundary.

Bhs—5 to 11 inches; dark reddish brown (5YR 3/3) fine sandy loam; weak medium and fine subangular blocky structure; friable; common fine to coarse roots; ortstein makes up 30 percent of the horizon and occurs as weakly cemented chunks; about 3 percent gravel and 10 percent cobbles; strongly acid; clear irregular boundary.

Bs—11 to 20 inches; reddish brown (5YR 4/4) loamy sand; weak medium and fine subangular blocky structure; friable; common fine to coarse roots; about 3 percent gravel and 10 percent cobbles; slightly acid; clear wavy boundary.

BC—20 to 28 inches; brown (7.5YR 5/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots; about 10 percent gravel and 10 percent cobbles; strongly effervescent in places; neutral; clear irregular boundary.

C—28 to 80 inches; light brown (7.5YR 6/4) gravelly fine sandy loam; massive; friable; about 10 percent gravel and 10 percent cobbles; strongly effervescent; slightly alkaline.

Bodi Series

The Bodi series consists of very deep, moderately well drained soils on ground moraines. These soils formed in loamy glacial till deposits. Permeability is moderate in the upper part of the solum and very slow in the lower part of the solum and in the substratum. Slopes range from 0 to 6 percent.

Typical pedon of Bodi silt loam, on a slope of 1 percent, 1,950 feet east and 1,200 feet south of the northwest corner of sec. 18, T. 48 N., R. 8 W., in Luce County, Michigan:

Oe—0 to 1 inch; dark brown (7.5YR 3/2), partially decomposed leaf litter; moderate fine granular structure; friable; many fine to coarse roots; 1 percent gravel and 5 percent cobbles and stones; extremely acid; abrupt wavy boundary.

E—1 to 4 inches; brown (7.5YR 5/2) silt loam, gray (7.5YR 6/1) dry; moderate fine subangular blocky structure; friable; common fine to coarse roots; 1 percent gravel and 5 percent cobbles and stones; extremely acid; abrupt irregular boundary.

- Bhs—4 to 5 inches; dark brown (7.5YR 3/2) silt loam; moderate fine subangular blocky structure; friable; many fine to coarse roots; 1 percent gravel and 5 percent cobbles and stones; very strongly acid; abrupt broken boundary.
- Bs1—5 to 12 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common fine to coarse roots; 1 percent gravel and 5 percent cobbles and stones; extremely acid; clear smooth boundary.
- Bs2—12 to 17 inches; strong brown (7.5YR 4/6) silt loam; moderate medium subangular blocky structure; friable; few fine and medium roots; 1 percent gravel and 5 percent cobbles and stones; very strongly acid; clear smooth boundary.
- 2Bs3—17 to 24 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; friable; few fine roots; ortstein makes up 20 percent of the horizon and is weakly cemented; ortstein occurs as strong brown (7.5YR 5/6) discontinuous chunks; 4 percent gravel and 5 percent cobbles and stones; strongly acid; clear irregular boundary.
- 3(E/B)x—24 to 30 inches; 60 percent brown (7.5YR 5/3) loamy sand, pinkish gray (7.5YR 6/2) dry (E); surrounding peds of reddish brown (5YR 5/4) sandy loam (Bt); weak coarse subangular blocky structure; very firm; common fine and medium vesicular and tubular pores; common medium distinct strong brown (7.5YR 4/6) masses of iron accumulation; 2 percent gravel and 10 percent cobbles and stones; strongly acid; gradual wavy boundary.
- 3(B/E)x—30 to 44 inches; 70 percent reddish brown (5YR 5/4) sandy loam (Bt); surrounded by reddish brown (5YR 5/3) loamy sand, pinkish gray (5YR 6/2) dry (E); weak coarse subangular blocky structure; very firm; common faint discontinuous reddish brown (5YR 4/4) clay films on faces of peds and in pores; common fine and medium vesicular and tubular pores; common medium distinct strong brown (7.5YR 4/6) masses of iron accumulation; 2 percent gravel and 10 percent cobbles and stones; strongly acid; gradual wavy boundary.
- 3Cd—44 to 80 inches; reddish brown (5YR 5/4) loamy sand; weak medium platy structure inherent from deposition; firm; 2 percent gravel and 5 percent cobbles and stones; moderately acid.

Caffey Series

The Caffey series consists of very deep, poorly drained and very poorly drained soils on outwash plains, lake plains, and deltas. These soils formed in sandy glaciofluvial deposits and in the underlying loamy and sandy stratified lacustrine sediments. Permeability is rapid or moderately rapid in the upper sandy part and moderately slow in the lower part of the profile.

Typical pedon of Caffey muck, 50 feet east and 1,650 feet south of the northwest corner of sec. 16, T. 43 N., R. 8 W., in Mackinac County, Michigan:

- Oa—0 to 6 inches; muck, black (10YR 2/1) broken face and rubbed; about 15 percent fibers, 2 percent rubbed; moderate medium granular structure; friable; many fine to coarse roots; neutral; abrupt smooth boundary.
- Bw—6 to 12 inches; brown (10YR 5/3) sand; weak medium subangular blocky structure; very friable; few fine and medium roots; black (10YR 2/1) organic stains along root channels; common medium distinct (10YR 5/6) iron accumulations; slightly alkaline; clear smooth boundary.
- Cg—12 to 21 inches; 60 percent grayish brown (10YR 5/2) and 40 percent dark yellowish brown (10YR 4/4), stratified medium and fine sand; massive; friable; common fine distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/6) iron accumulations; moderately alkaline; clear smooth boundary.
- 2C—21 to 35 inches; brown (10YR 5/3), gray (10YR 5/1), grayish brown (2.5Y 5/2), and light olive brown (2.5Y 5/4), stratified very fine sandy loam and loamy very fine

sand; massive; friable; common medium distinct yellowish brown (10YR 5/6) and many medium distinct light olive brown (2.5Y 5/6) iron accumulations; slightly effervescent; moderately alkaline; clear wavy boundary.

2Cg—35 to 80 inches; grayish brown (2.5Y 5/2) very fine sandy loam; massive; friable; violently effervescent; moderately alkaline.

Carbondale Series

The Carbondale series consists of very deep, very poorly drained soils on outwash plains, ground moraines, and lake plains. These soils formed in herbaceous organic material more than 51 inches thick. Permeability is moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Typical pedon of Carbondale muck (fig. 10); in an area of Carbondale, Lupton, and Tawas soils, 2,900 feet south and 800 feet west of the northeast corner of sec. 9, T. 43 N., R. 26 W.; USGS Northland NE topographic quadrangle; lat. 46 degrees 08 minutes 10 seconds N. and long. 87 degrees 33 minutes 25 seconds W., in Marquette County, Michigan:

Oa1—0 to 6 inches; muck, black (10YR 2/1) broken face and rubbed; about 10 percent fiber, 2 percent rubbed; weak fine granular structure; many very fine to coarse roots; slightly acid; clear wavy boundary.

Oa2—6 to 23 inches; muck, black (N 2.5/0) broken face and rubbed; about 10 percent fiber, 2 percent rubbed; weak medium subangular blocky structure; slightly acid; clear smooth boundary.

Oa3—23 to 38 inches; muck, black (N 2.5/0) broken face and rubbed; about 35 percent fiber, 10 percent rubbed; weak medium subangular blocky structure; slightly acid; clear smooth boundary.

Oe1—38 to 68 inches; mucky peat, black (10YR 2/1) broken face and rubbed; about 90 percent fiber, 33 percent rubbed; massive; neutral; clear smooth boundary.

Oe2—68 to 80 inches; mucky peat, black (10YR 2/1) broken face and rubbed; about 90 percent fiber, 20 percent rubbed; massive; neutral.

Chesbrough Series

The Chesbrough series consists of very deep, somewhat poorly drained soils on ground moraines. These soils formed in loamy glacial till deposits. Permeability is very slow in the fragipan and moderate in the rest of the profile. Slopes range from 0 to 3 percent.

Typical pedon of Chesbrough silt loam, 2,200 feet east and 1,050 feet south of the northwest corner of sec. 18, T. 48 N., R. 8 W., in Luce County, Michigan:

Oa—0 to 1 inch; highly decomposed plant material; moderate medium granular structure; friable; many fine to coarse roots; extremely acid; abrupt smooth boundary.

A—1 to 2 inches; black (7.5YR 2/1) silt loam, dark gray (7.5YR 4/1) dry; moderate fine subangular blocky structure; friable; many fine to coarse roots; 2 percent gravel, 3 percent cobbles, and 2 percent stones; extremely acid; abrupt wavy boundary.

E—2 to 4 inches; grayish brown (10YR 5/2) silt loam, gray (10YR 6/1) dry; moderate fine subangular blocky structure; friable; many fine to coarse roots; 2 percent gravel, 3 percent cobbles, and 2 percent stones; very strongly acid; abrupt irregular boundary.

Bs1—4 to 10 inches; brown (7.5YR 4/4) silt loam; moderate fine subangular blocky structure; friable; common fine to coarse roots; common fine faint strong brown (7.5YR 4/6) and common fine distinct strong brown (7.5YR 5/6) masses of iron



Figure 10.—Profile of Carbondale muck. Carbondale soils formed in herbaceous organic deposits. They support stands of northern whitecedar. Depth is marked in inches.

accumulation; 2 percent gravel, 3 percent cobbles, and 2 percent stones; very strongly acid; abrupt broken boundary.

2Bs2—10 to 12 inches; strong brown (7.5YR 4/6) gravelly loamy sand; weak medium subangular blocky structure; friable; few fine and medium roots; few fine faint strong brown (7.5YR 5/6) masses of iron accumulation; 12 percent gravel, 5 percent cobbles, and 5 percent stones; very strongly acid; clear wavy boundary.

3B/E—12 to 16 inches; 55 percent reddish brown (5YR 5/4) sandy loam (Bt); surrounded by light brown (7.5YR 6/3) loamy sand, pinkish gray (7.5YR 7/2) dry (E); weak medium subangular blocky structure; friable; few fine and medium roots; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; 8 percent gravel, 1 percent cobbles, and 1 percent stones; very strongly acid; clear wavy boundary.

3(B/E)x—16 to 22 inches; 75 percent reddish brown (5YR 4/4) sandy loam (Bt); surrounded by brown (7.5YR 5/3) loamy sand, pinkish gray (7.5YR 6/2) dry (E); weak thick platy structure; very firm; many fine vesicular pores; many faint discontinuous reddish brown (5YR 4/4) clay films on faces of peds and in pores;

- common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; 8 percent gravel, 1 percent cobbles, and 1 percent stones; strongly acid; clear wavy boundary.
- 3Bt—22 to 30 inches; reddish brown (2.5YR 4/4) sandy loam; moderate medium subangular blocky structure; firm; many fine vesicular pores; many faint discontinuous red (2.5YR 4/6) clay films on faces of peds and in pores; 8 percent gravel, 1 percent cobbles, and 1 percent stones; strongly acid; gradual wavy boundary.
- 3C1—30 to 62 inches; reddish brown (2.5YR 4/4) sandy loam; moderate medium platy structure inherent from deposition; firm; 8 percent gravel and 2 percent cobbles; strongly acid; gradual wavy boundary.
- 3C2—62 to 80 inches; light brown (7.5YR 6/4) and reddish brown (5YR 5/4) sandy loam and loamy sand; massive; friable; few fine distinct yellowish red (5YR 5/6) masses of iron accumulation; 8 percent gravel and 2 percent cobbles; strongly acid.

Croswell Series

The Croswell series consists of very deep, moderately well drained soils on low dunes, lake plains, and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 6 percent.

Typical pedon of Croswell sand, on a slope of 2 percent, 1,800 feet east and 950 feet north of the southwest corner of sec. 29, T. 44 N., R. 9 W., in Mackinac County, Michigan:

- Oe—0 to 2 inches; partially decomposed leaf litter.
- E—2 to 6 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak fine subangular blocky structure; very friable; common fine and medium roots; very strongly acid; abrupt wavy boundary.
- Bs1—6 to 8 inches; dark brown (7.5YR 4/4) sand; weak fine subangular blocky structure; very friable; many fine to coarse roots; common (about 15 percent) distinct cracked coatings on sand grains; strongly acid; clear irregular boundary.
- Bs2—8 to 15 inches; strong brown (7.5YR 5/6) sand; weak medium subangular blocky structure; very friable; common medium and fine roots; common (about 15 percent) distinct cracked coatings on sand grains; strongly acid; clear irregular boundary.
- BC—15 to 22 inches; brownish yellow (10YR 6/6) sand; single grain; loose; few fine roots; moderately acid; gradual wavy boundary.
- C—22 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; common fine prominent strong brown (7.5YR 5/6) iron accumulations beginning at a depth of 27 inches; moderately acid.

Dawson Series

The Dawson series consist of very deep, very poorly drained soils in depressions on ground moraines, lake plains, and outwash plains. These soils formed in herbaceous organic material 16 to 51 inches thick over sandy deposits. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy underlying material. Slopes range from 0 to 2 percent.

Typical pedon of Dawson peat; in an area of Dawson, Loxley, and Greenwood soils, 2,640 feet south and 1,320 feet east of the northwest corner of sec. 13, T. 42 N., R. 16 W., in Schoolcraft County, Michigan:

- Oi—0 to 10 inches; peat, reddish brown (5YR 4/3) broken face and rubbed; about 95 percent fiber, 90 percent rubbed; massive; friable; fibers are herbaceous; many fine and medium roots; extremely acid; abrupt smooth boundary.
- Oa1—10 to 19 inches; muck, very dark gray (5YR 3/1) broken face and rubbed; about 75 percent fiber, 15 percent rubbed; weak thick platy structure; friable; fibers are herbaceous; few fine roots; extremely acid; abrupt smooth boundary.
- Oa2—19 to 38 inches; muck, black (5YR 2.5/1) broken face and rubbed; about 10 percent fiber, 1 percent rubbed; massive; friable; fibers are herbaceous; extremely acid; abrupt smooth boundary.
- C—38 to 80 inches; dark brown (7.5YR 3/3) fine sand; single grain; loose; many coarse prominent pale brown (10YR 6/3) masses of iron depletions with sharp boundaries on ped faces; very strongly acid.

Deer Park Series

The Deer Park series consists of very deep, excessively drained soils on beach ridges and dunes. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 60 percent.

Typical pedon of Deer Park sand (fig. 11), 700 feet east and 900 feet north of the southwest corner of sec. 36, T. 50 N., R. 13 W., in Alger County, Michigan:

- Oa—0 to 2 inches; black (7.5YR 2.5/1), partially decomposed organic material; many very fine to coarse roots; abrupt smooth boundary.
- A—2 to 3 inches; very dark gray (7.5YR 3/1) sand, gray (7.5YR 5/1) dry; weak fine granular structure; very friable; many very fine to coarse roots; abrupt wavy boundary.
- E—3 to 10 inches; light gray (7.5YR 7/1) sand, pinkish gray (7.5YR 6/2) dry; weak very fine subangular blocky structure; very friable; many very fine to coarse roots; very strongly acid; abrupt wavy boundary.
- Bs1—10 to 16 inches; dark yellowish brown (10YR 4/6) sand; weak very fine subangular blocky structure; very friable; common very fine to medium roots; very strongly acid; gradual wavy boundary.
- Bs2—16 to 21 inches; strong brown (7.5YR 5/6) sand; weak fine subangular blocky structure; very friable; common very fine to medium roots; very strongly acid; gradual wavy boundary.
- BC—21 to 33 inches; light brown (7.5YR 6/4) sand; weak fine subangular blocky structure; very friable; few very fine and fine roots; very strongly acid; gradual wavy boundary.
- C—33 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; few very fine and fine roots; strongly acid.

Deerton Series

The Deerton series consists of moderately deep, well drained soils on bedrock-controlled ground moraines. These soils formed in sandy deposits overlying sandstone bedrock. Permeability is rapid. Slopes range from 0 to 35 percent.

Typical pedon of Deerton loamy sand, 1,250 feet north and 450 feet west of the southeast corner of sec. 6, T. 48 N., R. 10 W., in Luce County, Michigan:

- Oa—0 to 2 inches; well decomposed leaf litter; moderately acid; clear smooth boundary.
- E—2 to 6 inches; reddish gray (5YR 5/2) loamy sand, pinkish gray (5YR 6/2) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; 1 percent gravel and 5 percent cobbles; moderately acid; clear wavy boundary.



Figure 11.—Profile of Deer Park sand. This soil has very weak spodic development below the surface horizon. Deer Park soils occur along the Lake Superior shoreline below the Glacial Lake Nipissing shoreline. They were the last soils deposited in the survey area by glaciation. Depth is marked in inches.

- Bhs—6 to 23 inches; dark reddish brown (5YR 3/2) loamy sand; moderate medium subangular structure; friable; many fine to coarse roots; 1 percent gravel and 5 percent cobbles; strongly acid; abrupt wavy boundary.
- C—23 to 33 inches; brown (7.5YR 5/4) sand; moderate medium subangular blocky structure; friable; few fine roots; 10 percent very dark brown (7.5YR 2.5/2) chunks of soft sandstone; moderately acid; clear wavy boundary.
- 2Cr—33 to 55; pinkish gray (7.5YR 6/2) and very dark brown (7.5YR 2.5/2), highly weathered sandstone; slightly acid; gradual wavy boundary.
- 2R—55 inches; sandstone bedrock.

Deford Series

The Deford series consists of very deep, poorly drained soils on outwash plains and lake plains. These soils formed in sandy glaciofluvial deposits. Permeability is rapid. Slopes range from 0 to 2 percent.

Typical pedon of Deford fine sand, 600 feet south and 200 feet west of the northeast corner of sec. 8, T. 41 N., R. 3 E., Detour Township, Chippewa County, Michigan; NAD 27:

- A—0 to 4 inches; very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) fine sand, gray (10YR 5/1) and light brownish gray (10YR 6/2) dry; weak fine granular structure parting to single grain; very friable; many very fine and fine and few medium roots; neutral; abrupt wavy boundary.
- C1—4 to 18 inches; light yellowish brown (10YR 6/4) (uncoated sand grains) fine sand; single grain; loose; few medium prominent strong brown (7.5YR 5/6 and 5/8) masses of iron accumulations in root channels; few fine roots; slightly alkaline; gradual wavy boundary.
- C2—18 to 32 inches; pale brown (10YR 6/3) (uncoated sand grains) fine sand; single grain; loose; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulations in root channels; slightly alkaline; gradual wavy boundary.
- Cg—32 to 80 inches; grayish brown (10YR 5/2) (uncoated sand grains) fine sand; single grain; loose; slightly alkaline.

Dillingham Series

The Dillingham series consists of very deep, well drained soils on disintegration moraines. These soils formed in sandy deposits. Permeability is moderately rapid in the upper part of the subsoil, slow in the fragipan, and moderately rapid in the substratum. Slopes range from 0 to 70 percent.

Typical pedon of Dillingham loamy sand; in an area of Dillingham-Kalkaska complex, 1,750 feet east and 2,100 feet north of the southwest corner of sec. 29, T. 48 N., R. 12 W., in Luce County, Michigan:

- Oe—0 to 1 inch; partially decomposed leaf litter; weak medium granular structure; friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.
- E—1 to 8 inches; brown (7.5YR 5/3) loamy sand, pinkish gray (7.5YR 7/2) dry; weak medium subangular blocky structure; friable; common fine to coarse roots; 1 percent cobbles; extremely acid; abrupt irregular boundary.
- Bhs—8 to 11 inches; dark brown (7.5YR 3/3) loamy sand; weak medium subangular blocky structure; friable; many fine to coarse roots; 1 percent cobbles; extremely acid; abrupt irregular boundary.
- Bs—11 to 21 inches; dark brown (7.5YR 3/4) loamy fine sand; weak medium subangular blocky structure; friable; many fine to coarse roots; 1 percent cobbles; extremely acid; abrupt irregular boundary.
- (E/B)x—21 to 31 inches; about 60 percent light reddish brown (5YR 6/3) fine sand, pinkish gray (7.5YR 6/2) dry (E); surrounding peds of reddish brown (5YR 5/4) loamy fine sand (Bt); weak thick platy structure; very firm; common fine and medium roots in cracks; few thin clay films on faces of peds; many fine and medium vesicular and tubular pores; 1 percent gravel and 1 percent cobbles; extremely acid; clear wavy boundary.
- C—31 to 80 inches; reddish brown (5YR 5/4) and pinkish gray (5YR 6/2) sand with bands of reddish brown (2.5YR 5/4) loamy fine sand; massive but weak thick platy fragments; firm; 1 percent gravel and 1 percent cobbles; extremely acid.

Dorval Series

The Dorval series consists of very deep, very poorly drained soils in depressions and drainageways on lake plains. These soils formed in organic material 16 to 50 inches thick over clayey glaciolacustrine materials. Permeability is moderate or moderately rapid in the organic material and very slow in the underlying clayey deposits.

Typical pedon of Dorval muck, 750 feet west and 20 feet north of the southeast corner of sec. 27, T. 46 N., R. 1 W., in Chippewa County, Michigan:

- Oa1—0 to 12 inches; muck, black (N 2/0) broken face and black (5YR 2/1) rubbed; about 15 percent fiber, 3 percent rubbed; weak medium subangular blocky structure parting to weak medium granular; very friable; fibers are herbaceous; common fine to coarse roots; very strongly acid; abrupt smooth boundary.
- Oa2—12 to 19 inches; muck, very dark gray (10YR 3/1) broken face and black (5YR 2/1) rubbed; about 70 percent fiber, 10 percent rubbed; massive; friable; fibers are herbaceous; moderately acid; abrupt smooth boundary.
- Oe—19 to 23 inches; muck, dark reddish brown (5YR 2/2) broken face and rubbed; about 90 percent fibers, 30 percent rubbed; moderate thin platy structure; friable; fibers are herbaceous; moderately acid; abrupt smooth boundary.
- Cg—23 to 33 inches; gray (5YR 6/1) silty clay loam; massive; firm; common medium prominent light red (2.5YR 6/6) and common fine prominent yellowish brown (10YR 5/6) iron accumulations; few medium roots; neutral; abrupt smooth boundary.
- C—33 to 80 inches; reddish brown (2.5YR 5/4) silty clay; massive; firm; many medium prominent gray (5YR 5/1), common fine prominent olive (5Y 5/3), and few fine prominent light greenish gray (5GY 7/1) iron depletions; common medium prominent yellowish brown (10YR 5/6) iron accumulations; neutral.

Fence Series

The Fence series consists of very deep, moderately well drained soils on lake plains and till-floored lake plains. These soils formed in stratified silty glaciolacustrine deposits. Permeability is moderate in the solum and moderately slow in the substratum. Slopes range from 0 to 6 percent.

Typical pedon of Fence silt loam, 250 feet west and 750 feet south of the northeast corner of sec. 34, T. 49 N., R. 8 W., in Luce County, Michigan:

- Oe—0 to 2 inches; partially decomposed leaf litter; strongly acid; abrupt wavy boundary.
- E—2 to 5 inches; reddish gray (5YR 5/2) silt loam, pinkish gray (5YR 7/2) dry; moderate fine and medium subangular blocky structure; friable; many fine to coarse roots; 1 percent gravel; strongly acid; abrupt wavy boundary.
- Bhs—5 to 13 inches; dark brown (7.5YR 3/2) silt loam; moderate fine and medium subangular blocky structure; friable; many fine to coarse roots; 1 percent gravel; moderately acid; abrupt wavy boundary.
- B/E—13 to 23 inches; about 70 percent reddish brown (5YR 5/4) silt loam (Bt); common fine faint reddish brown (5YR 4/4) clay films on faces of peds; penetrated by tongues of reddish gray (5YR 5/2) silt loam (E), pinkish gray (7.5YR 7/2) dry; moderate fine to medium subangular blocky structure; firm; few fine to coarse roots; many fine vesicular pores; 1 percent gravel; many fine prominent and distinct strong brown (7.5YR 5/6) iron accumulations; slightly acid; gradual wavy boundary.

- Bt—23 to 33 inches; reddish brown (5YR 5/3) silt loam; moderate medium and coarse subangular blocky structure; friable; few fine faint reddish brown (5YR 4/4) clay films in pores; few fine to coarse roots; common fine vesicular pores; 1 percent gravel; slightly acid; gradual wavy boundary.
- C—33 to 80 inches; light reddish brown (5YR 6/3) silt loam; moderate thick plates inherent from deposition; friable; 1 percent gravel; slightly effervescent; slightly alkaline.

Fibre Series

The Fibre series consists of very deep, poorly drained soils on lake plains and outwash plains. These soils formed in sandy sediments and the underlying clayey deposits. Permeability is rapid in the sandy layers and very slow in the clayey layers. Slopes range from 0 to 2 percent.

Typical pedon of Fibre muck, 2,200 feet west and 1,300 feet south of the northeast corner of sec. 10, T. 44 N., R. 2 W., in Chippewa County, Michigan:

- Oa—0 to 5 inches; black (N 2/0) muck; weak fine granular structure; friable; many fine to coarse roots; very strongly acid; abrupt smooth boundary.
- E—5 to 13 inches; brown (10YR 5/3) sand; weak fine subangular blocky structure; very friable; common fine and medium roots; few fine faint brown (10YR 4/3) iron accumulations; very strongly acid; abrupt wavy boundary.
- Bs—13 to 17 inches; dark brown (7.5YR 3/4) sand; weak fine subangular blocky structure; very friable; common fine and medium roots; few distinct cracked coatings on sand grains; common medium distinct dark brown (7.5YR 3/2) iron accumulations; neutral; abrupt smooth boundary.
- E/B—17 to 19 inches; about 60 percent reddish brown (5YR 5/3) loamy sand (E); surrounding peds of reddish brown (5YR 5/4) fine sandy loam (Bt); weak medium subangular blocky structure; firm; few fine roots; common medium prominent strong brown (7.5YR 5/6) and few medium prominent yellowish brown (10YR 5/6) iron accumulations; neutral; abrupt smooth boundary.
- 2Bt—19 to 27 inches; reddish brown (5YR 5/4) clay; moderate very fine subangular blocky structure; firm; few fine roots; many fine and very fine vesicular pores; few faint reddish brown (5YR 5/3) clay films on faces of peds; common medium distinct yellowish red (5YR 4/6) iron accumulations and common medium prominent greenish gray (5G 5/1) iron depletions; slightly alkaline; clear wavy boundary.
- 2C—27 to 80 inches; stratified reddish brown (5YR 4/4 and 5/3) clay with thin bands of pinkish gray (7.5YR 6/2) silt; moderate medium platy structure parting to moderate very fine subangular blocky; firm; few fine roots; common fine and very fine vesicular pores; common medium distinct light reddish brown (5YR 6/3) iron accumulations; strong effervescence; moderately alkaline.

Finch Series

The Finch series consists of very deep, somewhat poorly drained soils on lake plains and outwash plains. These soils formed in sandy deposits. Permeability is moderate or moderately rapid in the ortstein layer and rapid in the rest of the profile. Slopes range from 0 to 3 percent.

Typical pedon of Finch sand (fig. 12), on a slope of 2 percent; in an area of Spot-Finch complex, 1,500 feet east of the center of sec. 8, T. 44 N., R. 7 W., in Mackinac County, Michigan:



Figure 12.—Profile of Finch sand. Masses of iron accumulation in the lower part of the subsoil indicate a high water table during the wet times of the year. Finch soils support stands of red pine, jack pine, and aspen. Depth is marked in inches.

Oe—0 to 1 inch; partially decomposed leaf litter.

E—1 to 11 inches; pinkish gray (10YR 6/2) sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; few fine to coarse roots; strongly acid; clear irregular boundary.

Bsm1—11 to 18 inches; dark brown (7.5YR 3/4) and dark reddish brown (7.5YR 3/2) sand; massive; very hard; ortstein makes up 100 percent of the horizon and is strongly cemented; ortstein occurs as a continuous layer and as tongues that extend to a depth of 21 inches; many medium distinct strong brown (7.5YR 5/6) iron accumulations; strongly acid; clear irregular boundary.

Bsm2—18 to 42 inches; splotchy color pattern of dark brown (7.5YR 4/4 and 3/4) and brown (7.5YR 5/4) sand; massive; very hard; ortstein makes up 90 percent of the horizon and is strongly cemented; ortstein occurs as a nearly continuous layer; common medium distinct strong brown (7.5YR 5/6) iron accumulations; strongly acid; gradual wavy boundary.

C—42 to 80 inches; yellowish brown (10YR 5/6) fine sand; single grain; loose; moderately acid.

Frohling Series

The Frohling series consists of very deep, well drained soils on ground moraines and end moraines. These soils formed in loamy glacial till deposits. Permeability is moderate in the upper part of the subsoil, very slow in the fragipan, and moderate in the underlying material. Slopes range from 8 to 70 percent.

Typical pedon of Frohling loamy sand, on a slope of 8 percent, 800 feet north and 1,700 feet west of the southeast corner of sec. 20, T. 49 N., R. 12 W., in Luce County, Michigan:

Oe—0 to 1 inch; black (10YR 2/1), partially decomposed forest litter.

E—1 to 3 inches; reddish gray (5YR 5/2) loamy sand, pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure; friable; many fine to coarse roots; about 5 percent cobbles and 2 percent gravel; very strongly acid; abrupt smooth boundary.

Bhs—3 to 7 inches; dark brown (7.5YR 3/3) fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; about 5 percent cobbles and 2 percent gravel; extremely acid; clear irregular boundary.

Bs—7 to 19 inches; brown (7.5YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; about 5 percent cobbles and 2 percent gravel; extremely acid; clear wavy boundary.

(B/E)x1—19 to 33 inches; about 70 percent reddish brown (5YR 5/4) sandy loam (Bt); surrounded by peds of brown (7.5YR 5/3) loamy sand (E), light brown (7.5YR 6/3) dry; strong medium subangular blocky structure; very firm; common fine vesicular pores; about 3 percent cobbles and 10 percent gravel; extremely acid; clear wavy boundary.

(B/E)x2—33 to 55 inches; about 70 percent reddish brown (5YR 4/4) sandy loam (Bt); surrounded by peds of reddish brown (5YR 5/3) loamy sand (E), light reddish brown (5YR 6/3) dry; moderate medium subangular blocky structure; firm; common fine vesicular pores; about 3 percent cobbles and 5 percent gravel; extremely acid; gradual wavy boundary.

C—55 to 80 inches; reddish brown (5YR 4/4) sandy loam; massive; friable; about 3 percent cobbles and 5 percent gravel; extremely acid.

Garlic Series

The Garlic series consists of very deep, well drained soils on till-floored lake plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 1 to 70 percent.

Typical pedon of Garlic sand, on a slope of 1 percent, 2,600 feet south of the northeast corner of sec. 13, T. 49 N., R. 12 W., in Alger County, Michigan:

Oe—0 to 2 inches; dark brown (7.5YR 3/3), partially decomposed leaf litter; moderate medium granular structure; friable; extremely acid; clear wavy boundary.

E—2 to 9 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear wavy boundary.

- Bhs—9 to 11 inches; dark reddish brown (5YR 3/2) sand; weak medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear irregular boundary.
- Bs—11 to 20 inches; reddish brown (5YR 4/4) sand; weak medium subangular blocky structure; friable; dark reddish brown (5YR 3/2 and 3/4) and yellowish red (5YR 4/6) ortstein makes up 62 percent of the horizon and occurs as columns that extend into the BC horizon; few fine to coarse roots between ortstein columns; very strongly acid; clear irregular boundary.
- BC—20 to 29 inches; yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) sand; weak fine subangular blocky structure; friable; few fine roots; strongly acid; gradual irregular boundary.
- C1—29 to 47 inches; light yellowish brown (10YR 6/4) fine sand; few thin brown (10YR 5/3) color bands; single grain; loose; very strongly acid; clear wavy boundary.
- C2—47 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; 1 percent gravel; very strongly acid.

Gogomain Series

The Gogomain series consists of very deep, poorly drained soils on lake plains. These soils formed in sandy and loamy glaciofluvial sediments and in the underlying clayey glaciolacustrine deposits. Permeability is moderately rapid in the upper part of the profile and very slow in the lower part. Slopes range from 0 to 2 percent.

Typical pedon of Gogomain very fine sandy loam, 1,100 feet north and 135 feet west of the southeast corner of sec. 1, T. 44 N., R. 3 W., in Chippewa County, Michigan:

- A—0 to 6 inches; black (10YR 2/1) very fine sandy loam, dark gray (10YR 4/1) dry; moderate medium granular structure; very friable; many fine to coarse roots; common fine pores; moderately acid; abrupt smooth boundary.
- Eg—6 to 10 inches; grayish brown (10YR 5/2) very fine sandy loam; weak medium platy structure parting to weak very fine subangular blocky; very friable; common fine and medium roots; common fine pores; few medium distinct yellowish brown (10YR 5/6) iron accumulations; neutral; abrupt smooth boundary.
- Bw1—10 to 19 inches; pale brown (10YR 6/3) loamy very fine sand; weak medium platy structure parting to weak very fine subangular blocky; very friable; common fine roots; few medium distinct dark gray (10YR 4/1) iron depletions and common medium distinct yellowish brown (10YR 5/6) iron accumulations; slightly alkaline; clear wavy boundary.
- Bw2—19 to 29 inches; brown (10YR 5/3) very fine sand; moderate medium and thick platy structure parting to weak very fine subangular blocky; very friable; few very fine and fine roots; few medium distinct dark gray (10YR 4/1) iron depletions and common medium distinct yellowish brown (10YR 5/6) iron accumulations; moderately alkaline; clear wavy boundary.
- Bg—29 to 37 inches; brown (7.5YR 5/2) very fine sand; moderate medium subangular blocky structure; very friable; few very fine roots; moderately alkaline; abrupt smooth boundary.
- 2C—37 to 39 inches; light reddish brown (5YR 6/3) clay; weak medium and thick platy structure parting to weak very fine subangular blocky; firm; few very fine roots; common coarse distinct yellowish red (5YR 5/6) iron accumulations and gray (5YR 5/1) iron depletions; slightly effervescent; moderately alkaline; abrupt smooth boundary.
- 2Cg—39 to 80 inches; pinkish gray (5YR 6/2) clay; weak medium and thick platy structure parting to weak fine subangular blocky; firm; few very fine roots; few

coarse distinct yellowish red (5YR 5/6) iron accumulations and few coarse faint gray (5YR 5/1) iron depletions; strongly effervescent; moderately alkaline.

Graveraet Series

The Graveraet series consists of very deep, moderately well drained soils on drumlins and ground moraines. These soils formed in loamy glacial till. Permeability is moderate in the upper part of the solum, slow in the lower part of the solum, and moderate in the substratum. Slopes range from 1 to 15 percent.

Typical pedon of Graveraet fine sandy loam, 145 feet north and 2,150 feet east of the southwest corner of sec. 27, T. 44 N., R. 12 W., in Mackinac County, Michigan:

- Oi—0 to 1 inch; slightly decomposed leaf litter.
- A—1 to 4 inches; very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1) dry; moderate coarse granular structure; friable; many fine to coarse roots; strongly acid; abrupt smooth boundary.
- E—4 to 7 inches; brown (7.5YR 5/3) fine sandy loam, pinkish gray (7.5YR 6/2) dry; moderate medium subangular blocky structure; friable; common fine to coarse roots; strongly acid; abrupt wavy boundary.
- Bhs—7 to 10 inches; dark reddish brown (5YR 3/2) fine sandy loam; weak fine subangular blocky structure; friable; common fine to coarse roots; strongly acid; clear wavy boundary.
- Bs—10 to 17 inches; dark brown (7.5YR 4/4) fine sandy loam; moderate thick platy structure; firm; few fine to coarse roots; few fine vesicular pores; few fine distinct strong brown (7.5YR 5/6) iron accumulations; strongly acid; abrupt wavy boundary.
- (E/B)x—17 to 33 inches; about 80 percent brown (7.5YR 5/3) loamy sand (E), pinkish gray (7.5YR 6/2) dry; surrounding peds of reddish brown (5YR 5/4) loam (Bt); moderate thick platy structure; firm; few fine roots; few fine vesicular pores; common faint reddish brown (5YR 5/4) clay films on faces of peds; few fine distinct strong brown (7.5YR 5/6) iron accumulations; about 2 percent gravel; moderately acid; gradual wavy boundary.
- B/E—33 to 48 inches; about 80 percent reddish brown (5YR 5/4) sandy clay loam (Bt); common faint reddish brown (5YR 4/4) clay films on faces of peds; surrounded by tongues of brown (7.5YR 5/3) loamy sand (E), pinkish gray (7.5YR 6/2) dry; moderate thick platy structure; firm; few fine roots; about 2 percent gravel; moderately acid; gradual wavy boundary.
- Bt—48 to 68 inches; reddish brown (5YR 5/4) sandy clay loam; moderate medium subangular blocky structure; friable; few faint reddish brown (5YR 4/4) clay films on faces of peds; about 5 percent gravel; neutral; gradual wavy boundary.
- C—68 to 80 inches; reddish brown (5YR 5/4) sandy loam; massive; friable; about 10 percent gravel; slightly effervescent; slightly alkaline.

Greenwood Series

The Greenwood series consists of very deep, very poorly drained soils in depressions on outwash plains, till-floored lake plains, and moraines. These soils formed in deep organic deposits. Permeability is moderate or moderately rapid. Slopes are 0 to 1 percent.

Typical pedon of Greenwood mucky peat, 800 feet north and 1,700 feet west of the southeast corner of sec. 13, T. 45 N., R. 19 W.; lat. 46 degrees 17 minutes 26.25 seconds N. and long. 86 degrees 44 minutes 73 seconds W., in Alger County, Michigan:

- Oe1—0 to 18 inches; mucky peat, black (10YR 2/1) broken face and rubbed; about 60 percent fiber, 50 percent rubbed; massive; nonsticky; common very fine to medium roots in the upper 4 inches; very strongly acid; clear smooth boundary.
- Oe2—18 to 65 inches; mucky peat, black (10YR 2/1) broken face and rubbed; about 70 percent fiber, 60 percent rubbed; massive; nonsticky; extremely acid; gradual smooth boundary.
- Oa—65 to 80 inches; muck, black (7.5YR 2.5/1) broken face and very dark brown (7.5YR 2.5/2) rubbed; 30 percent fiber, 5 percent rubbed; massive; nonsticky; very strongly acid.

Hendrie Series

The Hendrie series consists of very deep, poorly drained soils on lake plains. These soils formed in loamy glaciolacustrine deposits. Permeability is moderate.

Typical pedon of Hendrie mucky peat, in a forested area at an elevation of 715 feet, 275 feet east and 1,400 feet north of the southwest corner of sec. 9, T. 46 N., R. 8 W., in Luce County, Michigan:

- Oe—0 to 4 inches; dark brown (7.5YR 3/2) mucky peat; massive; friable; many fine to coarse roots; very strongly acid; abrupt wavy boundary.
- Eg—4 to 7 inches; grayish brown (2.5Y 5/2) silt loam, light gray (2.5Y 7/2) dry; moderate fine subangular blocky structure; friable; few fine to coarse roots; few medium distinct dark gray (10YR 4/1) iron depletions and few medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation; strongly acid; abrupt wavy boundary.
- Bw—7 to 16 inches; brown (7.5YR 5/4) silt loam; moderate medium platy structure; friable; few fine to coarse roots; common medium distinct strong brown (7.5YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation; neutral; clear wavy boundary.
- C1—16 to 48 inches; pinkish gray (7.5YR 6/2) silt loam; massive; firm; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—48 to 80 inches; light brownish gray (10YR 6/2) silt loam; massive or weak thin platy structure inherent from deposition; firm; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation; violently effervescent; moderately alkaline.

Kaks Series

The Kaks series consists of very deep, well drained soils on moraines. These soils formed in sandy deposits. Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. Slopes range from 0 to 60 percent.

Typical pedon of Kaks sandy loam; in an area of Kalkaska-Kaks complex, 1,900 feet east and 1,400 feet north of the southwest corner of sec. 35, T. 45 N., R. 10 W., in Luce County, Michigan:

- A—0 to 4 inches; black (7.5YR 2.5/1) sandy loam, dark gray (7.5YR 4/1) dry; moderate medium granular structure; friable; many fine to coarse roots; 5 percent gravel and 5 percent cobbles; moderately acid; clear irregular boundary.
- Bhs1—4 to 9 inches; dark brown (7.5YR 3/3) cobbly loamy sand; weak medium subangular blocky structure; friable; many fine to coarse roots; 10 percent gravel and 12 percent cobbles; moderately acid; clear wavy boundary.

- Bhs2—9 to 21 inches; dark reddish brown (5YR 3/3) cobbly loamy sand; weak medium subangular blocky structure; friable; many fine to coarse roots; 10 percent gravel and 12 percent cobbles; slightly acid; gradual irregular boundary.
- BC—21 to 35 inches; strong brown (7.5YR 5/6) cobbly loamy sand; weak medium subangular blocky structure; friable; common fine to coarse roots; 15 percent gravel and 10 percent cobbles; neutral; clear wavy boundary.
- C—35 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; few fine roots; few thin bands of brown (7.5YR 5/4) loamy sand; 1 percent gravel; neutral.

Kalkaska Series

The Kalkaska series consists of very deep, somewhat excessively drained soils on ground moraines, disintegration moraines, and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 70 percent.

Typical pedon of Kalkaska sand (fig. 13), 0 to 6 percent slopes, 1,400 feet west and 425 feet south of the northeast corner of sec. 31, T. 43 N., R. 15 W., in Schoolcraft County, Michigan:

- A—0 to 2 inches; black (10YR 2/1) sand, very dark gray (10YR 3/1) dry; weak medium granular structure; very friable; common fine and medium and few coarse roots; very strongly acid; abrupt wavy boundary.
- E—2 to 6 inches; brown (7.5YR 5/2) sand, gray (10YR 6/1) dry; weak medium subangular blocky structure; very friable; common fine to coarse roots; very strongly acid; clear irregular boundary.
- Bhs—6 to 8 inches; dark reddish brown (5YR 3/3) sand; weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots between columns of ortstein; columns of strongly cemented, dark reddish brown (5YR 3/2) and brown (7.5YR 5/4) ortstein 3 to 10 inches wide extend through this horizon into the Bs horizon; ortstein columns are 6 to 20 inches apart; ortstein makes up 20 percent of the horizon; very strongly acid; clear irregular boundary.
- Bs—8 to 16 inches; strong brown (7.5YR 4/6) sand; weak fine subangular blocky structure; very friable; few fine and medium roots between ortstein columns; columns of moderately strongly cemented, dark reddish brown (5YR 3/2 and 3/3) and brown (7.5YR 5/4) ortstein 3 to 7 inches wide extend through this horizon into the BC horizon; ortstein columns are 6 to 20 inches apart; ortstein makes up 10 percent of this horizon; strongly acid; clear wavy boundary.
- BC—16 to 26 inches; strong brown (7.5YR 5/6) sand; single grain; loose; few fine roots between ortstein columns; columns of moderately strongly cemented, dark reddish brown (5YR 3/2 and 3/3) and brown (7.5YR 5/4) ortstein 1 to 3 inches wide extend into this horizon from the Bs horizon; ortstein columns are 8 to 30 inches apart; ortstein makes up 5 percent of this horizon; strongly acid; gradual wavy boundary.
- C1—26 to 42 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; few fine roots; moderately acid; gradual wavy boundary.
- C2—42 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; moderately acid.

Kinross Series

The Kinross series consists of very deep, poorly drained soils on lake plains and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 2 percent.

Typical pedon of Kinross muck, 200 feet east and 300 feet south of the northwest corner of sec. 15, T. 47 N., R. 9 W., in Luce County, Michigan:



Figure 13.—Profile of Kalkaska sand (the State soil of Michigan). This soil has a strongly developed spodic horizon between the depths of 8 and 20 inches. Kalkaska soils support quality hardwood trees. Depth is marked in inches.

Oa—0 to 3 inches; dark reddish brown (5YR 3/2) muck; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.

Eg—3 to 14 inches; 50 percent grayish brown (10YR 5/2) and 50 percent dark gray (10YR 4/1) sand, light gray (10YR 7/1) and gray (10YR 6/1) dry; weak medium subangular blocky structure; friable; few fine roots; 1 percent gravel; extremely acid; gradual wavy boundary.

Bhs—14 to 22 inches; dark brown (7.5YR 3/3) sand; weak medium subangular blocky structure; friable; few fine roots; few medium faint dark brown (7.5YR 3/2) masses of iron accumulation along root channels; strongly acid; gradual wavy boundary.

Bs—22 to 35 inches; dark yellowish brown (10YR 4/4) sand; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

C—35 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; strongly acid.

Leafriver Series

The Leafriver series consists of very deep, very poorly drained soils on outwash plains and lake plains. These soils formed in a thin organic mantle over sandy

deposits. Permeability is moderate or moderately rapid in the organic material and rapid in the sandy sediments. Slopes are 0 to 1 percent.

Typical pedon of Leafriver mucky peat, 3,135 feet south and 990 feet west of the northeast corner of sec. 9, T. 42 N., R. 3 W., in Mackinac County, Michigan:

- Oe—0 to 2 inches; black (N 2/0) mucky peat; massive; friable; slightly acid; clear smooth boundary.
- Oa—2 to 8 inches; black (5YR 2/1) muck; massive; friable; many fine to coarse roots; slightly acid; clear smooth boundary.
- A—8 to 10 inches; black (10YR 2/1) loamy fine sand, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; many fine to coarse roots; few fine prominent yellowish brown (10YR 5/6) iron accumulations; slightly acid; abrupt wavy boundary.
- Cg1—10 to 23 inches; grayish brown (10YR 5/2) fine sand; single grain; loose; common coarse to fine roots; few fine distinct brownish yellow (10YR 6/8) iron accumulations; neutral; gradual wavy boundary.
- Cg2—23 to 39 inches; grayish brown (10YR 5/2) fine sand; single grain; loose; few fine roots; few fine distinct yellowish brown (10YR 5/8) iron accumulations; neutral; gradual smooth boundary.
- Cg3—39 to 80 inches; dark grayish brown (10YR 4/2) fine sand; single grain; loose; few fine distinct dark yellowish brown (10YR 4/6) iron accumulations; 5 percent gravel; neutral.

Liminga Series

The Liminga series consists of very deep, well drained soils on moraines and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 60 percent.

Typical pedon of Liminga fine sand, on a slope of 1 percent, 400 feet east and 3,100 feet south of the northwest corner of sec. 33, T. 45 N., R. 10 W., in Luce County, Michigan:

- Oe—0 to 1 inch; partially decomposed leaf litter; common fine roots; extremely acid; abrupt smooth boundary.
- E—1 to 7 inches; brown (7.5YR 4/2) fine sand, brown (7.5YR 5/2) dry; weak fine subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- Bhs—7 to 9 inches; dark brown (7.5YR 3/2) fine sand; weak fine subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt broken boundary.
- Bs1—9 to 12 inches; strong brown (7.5YR 4/6) fine sand; weak fine subangular blocky structure; friable; common fine to coarse roots; extremely acid; abrupt broken boundary.
- Bs2—12 to 22 inches; strong brown (7.5YR 5/6) fine sand; weak fine subangular blocky structure; friable; common fine roots; ortstein makes up 30 percent of the horizon and is moderately cemented; ortstein occurs as tongues 2 to 5 inches wide and extending to a depth of 29 inches; extremely acid; clear irregular boundary.
- BC—22 to 31 inches; brownish yellow (10YR 6/6) fine sand; single grain; loose; extremely acid; clear wavy boundary.
- C—31 to 80 inches; brownish yellow (10YR 6/6) fine sand; single grain; loose; one thin reddish brown (5YR 5/4) band; extremely acid.

Longrie Series

The Longrie series consists of moderately deep, well drained soils on ground moraines and glacial lake benches. These soils formed in loamy glacial till deposits underlain by limestone bedrock. Permeability is moderate. Slopes range from 0 to 35 percent.

Typical pedon of Longrie sandy loam, on a slope of 1 percent; in an area of Amadon-Longrie complex, 1,550 feet south and 150 feet west of the northeast corner of sec. 28, T. 42 N., R. 11 W., in Mackinac County, Michigan:

Oe—0 to 1 inch; partially decomposed leaf litter.

Oa—1 to 2 inches; well decomposed leaf litter.

E—2 to 6 inches; reddish gray (5YR 5/2) sandy loam, light gray (5YR 7/1) dry; moderate medium subangular blocky structure; friable; common fine to coarse roots; about 2 percent gravel and 3 percent cobbles; moderately acid; abrupt irregular boundary.

Bhs—6 to 8 inches; dark reddish brown (5YR 3/3) fine sandy loam; weak medium subangular blocky structure; friable; many fine to coarse roots; ortstein makes up about 30 of the horizon and occurs as moderately cemented chunks; about 2 percent gravel and 3 percent cobbles; moderately acid; clear irregular boundary.

Bs—8 to 23 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine to coarse roots; ortstein makes up about 30 of the horizon and occurs as moderately cemented chunks; about 2 percent gravel and 3 percent cobbles; slightly acid; clear wavy boundary.

C—23 to 36 inches; brown (7.5YR 5/4) sandy loam; moderate medium subangular blocky structure; friable; few fine roots; about 10 percent gravel and 3 percent cobbles; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2R—36 inches; fractured limestone bedrock.

Loxley Series

The Loxley series consists of very deep, very poorly drained soils in closed depressions on outwash plains, ground moraines, and lake plains. These soils formed in herbaceous organic material more than 51 inches thick. Permeability is moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Typical pedon of Loxley peat; in an area of Dawson, Loxley, and Greenwood soils, 1,320 feet east and 50 feet south of the northwest corner of sec. 14, T. 44 N., R. 9 W., in Luce County, Michigan:

Oi—0 to 8 inches; peat, dark yellowish brown (10YR 4/4) broken face and yellowish brown (10YR 5/4) rubbed; 100 percent sphagnum moss fibers, 95 percent rubbed; weak thick platy structure; friable; common fine and medium roots; extremely acid; abrupt smooth boundary.

Oa1—8 to 15 inches; muck, black (5YR 2/1) broken face and rubbed; about 45 percent fibers, 5 percent rubbed; weak thick platy structure; friable; fibers are herbaceous; common fine and medium roots; very strongly acid; clear smooth boundary.

Oa2—15 to 45 inches; muck, dark reddish brown (5YR 2/2) broken face and rubbed; about 45 percent fibers, 5 percent rubbed; massive; friable; fibers are herbaceous; very strongly acid; clear smooth boundary.

Oa3—45 to 80 inches; muck, dark reddish brown (5YR 2/2) broken face and rubbed; about 55 percent fibers, 5 percent rubbed; massive; friable; fibers are herbaceous; very strongly acid.

Lupton Series

The Lupton series consists of very deep, very poorly drained soils in depressions on lake plains, ground moraines, and outwash plains. These soils formed in herbaceous organic deposits more than 51 inches thick. Permeability is moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Typical pedon of Lupton peat; in an area of Carbondale-Lupton-Tawas soils, 462 feet north and 2,310 feet east of the southwest corner of sec. 18, T. 42 N., R. 13 W., in Mueller Township, Schoolcraft County, Michigan; USGS Blaney Park topographic quadrangle; lat. 46 degrees 01 minute 43 seconds N. and long. 85 degrees 58 minutes 45 seconds W.; NAD 27:

- Oi—0 to 4 inches; peat, black (7.5YR 2.5/1) broken face and rubbed; about 90 percent fiber unrubbed, 80 percent fiber rubbed; weak coarse granular structure; friable; many fine and common medium to coarse roots; neutral; abrupt smooth boundary.
- Oa1—4 to 14 inches; muck, black (5YR 2.5/1) broken face and rubbed; about 5 percent fiber, 1 percent fiber rubbed; weak medium granular structure; friable; few fine to coarse roots; about 5 percent woody fragments throughout; slightly alkaline; abrupt smooth boundary.
- Oa2—14 to 40 inches; muck, black (N 2/0) broken face and rubbed; about 15 percent fiber unrubbed, a trace rubbed; massive; friable; few fine roots; about 3 percent woody fragments throughout; slightly alkaline; abrupt smooth boundary.
- Oa3—40 to 80 inches; muck, black (N 2/0) broken face and rubbed; about 15 percent fiber unrubbed, a trace rubbed; massive; friable; about 3 percent woody fragments throughout; slightly alkaline.

Manistee Series

The Manistee series consists of very deep, well drained soils on lake plains. These soils formed in sandy outwash deposits underlain by clayey glaciolacustrine deposits. Permeability is rapid in the upper sandy material and slow and very slow in the underlying clay. Slopes range from 6 to 50 percent.

Typical pedon of Manistee sand, 100 feet west of the center of sec. 18, T. 43 N., R. 10 W., in Mackinac County, Michigan:

- Oe—0 to 1 inch; partially decomposed leaf litter.
- E—1 to 10 inches; pinkish gray (7.5YR 6/2) sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; few fine to coarse roots; strongly acid; abrupt irregular boundary.
- Bs1—10 to 18 inches; dark brown (7.5YR 3/4) sand; weak coarse subangular blocky structure; very friable; ortstein makes up 45 percent of the horizon and occurs as moderately cemented chunks; common fine to coarse roots; moderately acid; gradual wavy boundary.
- Bs2—18 to 26 inches; strong brown (7.5YR 4/6) sand; moderate coarse subangular blocky structure; friable; ortstein makes up 45 percent of the horizon and occurs as weakly to moderately cemented chunks; common fine and medium roots; slightly acid; clear smooth boundary.
- 2B/E—26 to 30 inches; 55 percent reddish brown (2.5YR 4/4) clay (Bt); surrounded by tongues of dark reddish gray (5YR 4/2) silty clay loam (E), pinkish gray (7.5YR 6/2) dry; common fine reddish brown (2.5YR 4/4) clay films on faces of peds; coarse medium subangular blocky structure; firm; common fine vesicular pores; common fine and medium roots; slightly acid; clear smooth boundary.

- 2Bt—30 to 36 inches; reddish brown (2.5YR 4/4) clay; strong coarse angular blocky structure; firm; many fine reddish brown (2.5YR 4/4) clay skins on faces of peds; common fine and medium roots; neutral; clear wavy boundary.
- 2C1—36 to 64 inches; reddish brown (2.5YR 5/4) clay with thin strata of light brown (7.5YR 6/3) silty clay loam and silt loam; massive; firm; few medium roots; strongly effervescent; moderately alkaline; clear wavy boundary.
- 3C2—64 to 80 inches; brown (7.5YR 5/4) loamy sand; single grain; loose; 12 percent gravel; strongly effervescent; moderately alkaline.

Markey Series

The Markey series consists of very deep, very poorly drained soils in depressions on outwash plains, lake plains, and flood plains. These soils formed in herbaceous organic material 16 to 50 inches thick overlying sand deposits. Permeability is moderately slow to moderately rapid in the organic material and rapid in the underlying sandy material.

Typical pedon of Markey mucky peat, 600 feet east and 2,489 feet south of the northeast corner of sec. 28, T. 46 N., R. 17 W., in Alger County, Michigan:

- Oe—0 to 3 inches; mucky peat, very dark brown (10YR 2/2) broken face and black (10YR 2/1) rubbed; about 50 percent fiber, 25 percent rubbed; weak fine granular structure; friable; fibers are herbaceous; many very fine and fine roots; extremely acid; abrupt smooth boundary.
- Oa1—3 to 9 inches; muck, very dark gray (10YR 3/1) broken face and rubbed; about 20 percent fibers, less than 5 percent rubbed; weak medium platy structure; friable; fibers are herbaceous; many very fine and fine roots; very strongly acid; clear smooth boundary.
- Oa2—9 to 20 inches; muck, very dark grayish brown (10YR 3/2) broken face and very dark gray (10YR 3/1) rubbed; about 10 percent fibers, less than 5 percent rubbed; weak medium platy structure; friable; fibers are herbaceous; many very fine and fine roots; very strongly acid; abrupt smooth boundary.
- Cg1—20 to 27 inches; dark grayish brown (10YR 4/2) sand; single grain; loose; few very fine roots at top of horizon; very strongly acid; gradual smooth boundary.
- Cg2—27 to 80 inches; brown (10YR 5/3) sand; single grain; loose; very strongly acid.

McMillan Series

The McMillan series consists of very deep, well drained soils on moraines. These soils formed in sandy glaciofluvial deposits that have a thin loamy cap. Permeability is moderate in the upper loamy part and rapid in the lower sandy sediments. Slopes range from 0 to 60 percent.

Typical pedon of McMillan fine sandy loam, 1,000 feet east and 1,250 feet south of the northwest corner of sec. 4, T. 45 N., R. 11 W., in Luce County, Michigan:

- Oe—0 to 1 inch; partially decomposed organic material; common fine roots; abrupt smooth boundary.
- A—1 to 4 inches; very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; many fine to coarse roots; 2 percent gravel; very strongly acid; abrupt wavy boundary.
- E—4 to 6 inches; brown (7.5YR 5/2) fine sandy loam, pinkish gray (7.5YR 6/2) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; very strongly acid; abrupt broken boundary.

Bhs—6 to 9 inches; dark brown (7.5YR 3/3) very fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; 5 percent gravel; very strongly acid; clear irregular boundary.

Bs1—9 to 16 inches; brown (7.5YR 4/4) very fine sandy loam; moderate medium subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; very strongly acid; clear wavy boundary.

Bs2—16 to 22 inches; strong brown (7.5YR 5/6) loamy fine sand; moderate medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

Bw—22 to 32 inches; reddish yellow (7.5YR 6/6) sand; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

E&Bt—32 to 80 inches; 70 percent light brown (7.5YR 6/3) sand (E), pinkish gray (7.5YR 7/2) dry; 30 percent lamellae of brown (7.5YR 5/4) loamy sand (Bt); massive; friable; few fine roots; 1 percent gravel; strongly acid.

Menominee Series

The Menominee series consists of very deep, well drained soils on ground moraines. These soils formed in sandy outwash material underlain by loamy glacial till. Permeability is rapid in the upper sandy part and moderate in the lower loamy part. Slopes range from 2 to 35 percent.

Typical pedon of Menominee sand (fig. 14), 400 feet south and 1,600 feet east of the northwest corner of sec. 36, T. 45 N., R. 11 W., in Luce County, Michigan:

Oe—0 to 1 inch; partially decomposed leaf litter; very strongly acid; abrupt wavy boundary.

E—1 to 8 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak medium subangular blocky structure; friable; many fine to coarse roots; very strongly acid; abrupt wavy boundary.

Bhs—8 to 11 inches; dark reddish brown (7.5YR 3/3) sand; weak medium subangular blocky structure; friable; many fine to coarse roots; very strongly acid; abrupt irregular boundary.

Bs1—11 to 22 inches; brown (7.5YR 4/4) sand; weak medium and fine subangular blocky structure; friable; dark brown (7.5YR 3/3) and strong brown (7.5YR 4/6) ortstein; ortstein makes up 10 percent of the horizon and occurs as columns that extend into the Bs2 horizon; many fine to coarse roots; strongly acid; clear irregular boundary.

Bs2—22 to 34 inches; strong brown (7.5YR 5/6) sand; moderate medium subangular blocky structure; friable; few fine to coarse roots; strongly acid; abrupt wavy boundary.

2B/E—34 to 46 inches; about 80 percent reddish brown (5YR 5/4) clay loam (Bt); surrounded by reddish gray (5YR 5/2) fine sandy loam (E), pinkish gray (7.5YR 6/2) dry; moderate medium subangular blocky structure; friable; few fine roots; common fine vesicular pores; about 5 percent gravel and 1 percent cobbles; slightly acid; clear irregular boundary.

2C—46 to 62 inches; reddish brown (5YR 4/4) loam; massive; friable; 5 percent gravel and 1 percent cobbles; slightly effervescent; moderately alkaline.

3C—62 to 80 inches; stratified light reddish brown (5YR 6/3) sand and reddish brown (5YR 4/4) and yellowish red (5YR 4/6) loamy sand; massive; friable; slightly acid.

Millecoquins Series

The Millecoquins series consists of very deep, moderately well drained soils on till-floored lake plains. These soils formed in stratified, loamy glaciolacustrine deposits.



Figure 14.—Profile of Menominee sand. This soil has a strongly developed spodic horizon in the sandy upper part. The lower part of the subsoil and the substratum are loamy till. Depth is marked in inches.

Permeability is moderate in the upper part of the solum and moderately slow in the lower part of the solum and in the substratum. Slopes range from 0 to 15 percent.

Typical pedon of Millecoquins silt loam, 2,100 feet south and 1,100 feet west of the northeast corner of sec. 15, T. 45 N., R. 8 W., in Luce County, Michigan:

- A—0 to 2 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; many fine to coarse roots; very strongly acid; abrupt smooth boundary.
- E—2 to 4 inches; reddish gray (5YR 5/2) silt loam, pinkish gray (7.5YR 6/2) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; very strongly acid; abrupt wavy boundary.
- Bhs—4 to 5 inches; dark reddish brown (5YR 3/2) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; very strongly acid; clear wavy boundary.
- Bs—5 to 12 inches; brown (7.5YR 4/3) silt loam; moderate medium subangular blocky structure; friable; common fine to coarse roots; very strongly acid; clear wavy boundary.
- B/E—12 to 25 inches; about 70 percent reddish brown (5YR 4/4) silty clay loam (Bt); many faint reddish brown (5YR 5/4) clay films on faces of peds; surrounded by tongues of brown (7.5YR 5/3) silt loam (E), light brown (7.5YR 6/3) dry; moderate medium and coarse subangular blocky structure; firm; few medium and coarse roots; few fine vesicular pores; common medium distinct strong brown (7.5YR 4/6) iron accumulations in the lower part; very strongly acid; clear wavy boundary.

- BC—25 to 31 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium and thick platy structure; firm; common medium distinct yellowish red (5YR 4/6) iron accumulations; slightly acid; gradual wavy boundary.
- C1—31 to 55 inches; stratified brown (7.5YR 4/4) silt loam and reddish brown (2.5YR 4/4) silty clay loam; massive but with thick plates; friable; common coarse distinct strong brown (7.5YR 4/6) iron accumulations; slightly effervescent; neutral; gradual wavy boundary.
- 2C2—55 to 80 inches; brown (7.5YR 4/3) loam; massive; friable; 5 percent gravel; slightly effervescent; moderately alkaline.

Noseum Series

The Noseum series consists of very deep, moderately well drained soils in outwash areas on ground moraines. These soils formed in sandy deposits that have a thin loamy cap. Permeability is moderately rapid in the loamy cap and rapid in the underlying sands. Slopes range from 0 to 4 percent.

Typical pedon of Noseum fine sandy loam, 1,000 feet west and 300 feet north of the southeast corner of sec. 34, T. 47 N., R. 10 W., in Luce County, Michigan:

- Oa—0 to 2 inches; well decomposed organic material; abrupt smooth boundary.
- E—2 to 5 inches; brown (7.5YR 5/2) fine sandy loam; weak medium subangular blocky structure; friable; few fine to coarse roots; abrupt irregular boundary.
- Bhs—5 to 7 inches; dark brown (7.5YR 3/2) fine sandy loam; weak medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear irregular boundary.
- Bs1—7 to 19 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; few fine to coarse roots; extremely acid; gradual irregular boundary.
- 2Bs2—19 to 27 inches; strong brown (7.5YR 5/6) sand; single grain; loose; common medium distinct strong brown (7.5YR 5/8) iron accumulations in the lower 2 inches; 3 percent gravel; ortstein makes up 30 percent of the horizon and occurs as very weakly cemented chunks; extremely acid; gradual irregular boundary.
- 2BC—27 to 39 inches; reddish yellow (10YR 6/6) sand; single grain; loose; common medium prominent strong brown (7.5YR 5/8) iron accumulations; 6 percent gravel; extremely acid; gradual wavy boundary.
- 2C—39 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; common medium prominent strong brown (7.5YR 5/6) iron accumulations; extremely acid.

Okeefe Series

The Okeefe series consists of very deep, well drained soils on moraines and outwash plains and in lake basins. These soils formed in sandy outwash material underlain by loamy glaciolacustrine deposits. Permeability is rapid in the sandy material and moderate in the loamy material. Slopes range from 0 to 60 percent.

Typical pedon of Okeefe sand, on a slope of 5 percent, in a forested area at an elevation of 740 feet, 1,450 feet west and 1,200 feet south of the northeast corner of sec. 31, T. 49 N., R. 9 W., in Luce County, Michigan:

- Oe—0 to 2 inches; black (7.5YR 2.5/1), partially decomposed leaf litter; many fine to coarse roots; extremely acid; abrupt smooth boundary.
- E—2 to 6 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 7/2) dry; moderate medium subangular blocky structure; very friable; common fine to coarse roots; extremely acid; abrupt irregular boundary.

- Bhs—6 to 7 inches; dark brown (7.5YR 3/2) sand; moderate medium subangular blocky structure; very friable; many fine to coarse roots; extremely acid; clear irregular boundary.
- Bs1—7 to 14 inches; brown (7.5YR 4/4) sand; weak medium subangular blocky structure; very friable; few medium and coarse roots; very strongly acid; clear irregular boundary.
- Bs2—14 to 19 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; few medium and coarse roots; very strongly acid; clear irregular boundary.
- BC—19 to 31 inches; yellowish brown (10YR 5/4) sand; weak medium subangular blocky structure; friable; few medium roots; 1 percent gravel; strongly acid; clear wavy boundary.
- 2C—31 to 80 inches; stratified brown (7.5YR 5/3) silt loam and brown (10YR 5/3) and pale brown (10YR 6/3) silt; moderate medium platy structure inherent from deposition; friable; very strongly acid.

Ontonagon Series

The Ontonagon series consists of very deep, well drained soils on lake plains. These soils formed in clayey glaciolacustrine deposits. Permeability is very slow. Slopes range from 6 to 50 percent.

Typical pedon of Ontonagon silt loam, 125 feet east and 2,500 feet north of the southwest corner of sec. 15, T. 47 N., R. 1 E., in Chippewa County, Michigan:

- A—0 to 7 inches; dark brown (7.5YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; many fine roots; moderately acid; clear smooth boundary.
- B/E—7 to 13 inches; about 75 percent reddish brown (2.5YR 4/4) silty clay (Bt); common faint reddish brown (2.5YR 4/4) clay films on faces of peds; surrounded by tongues of brown (7.5YR 5/2) silty loam (E), pinkish gray (7.5YR 6/2) dry; moderate medium and coarse subangular blocky structure; friable; common fine roots; neutral; gradual smooth boundary.
- Bt—13 to 21 inches; reddish brown (2.5YR 4/4) clay; strong fine angular blocky structure; firm; common fine roots; common distinct reddish brown (2.5YR 4/4) clay films on faces of peds; neutral; gradual smooth boundary.
- BC—21 to 32 inches; reddish brown (2.5YR 4/4) and grayish brown (10YR 5/2) clay; moderate thick platy structure parting to strong very fine angular blocky; firm; few fine roots; slightly alkaline; gradual smooth boundary.
- C—32 to 80 inches; reddish brown (2.5YR 4/4) clay; moderate thick platy structure parting to strong very fine angular blocky; grayish brown (10YR 5/2) varves; firm; common prominent light gray (10YR 7/1) calcium carbonate accumulations; strongly effervescent; moderately alkaline.

Paquin Series

The Paquin series consists of very deep, moderately well drained soils on lake plains, outwash plains, ground moraines, bars, low dunes, and beach ridges. These soils formed in sandy deposits. Permeability is moderate or moderately rapid in the upper part and in the ortstein layers and rapid in the rest of the profile. Slopes range from 0 to 6 percent.

Typical pedon of Paquin sand, 900 feet south and 75 feet east of the northwest corner of sec. 7, T. 44 N., R. 7 W., in Mackinac County, Michigan:

- Oe—0 to 2 inches; partially decomposed hardwood leaf litter.
- E—2 to 12 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine to coarse roots; strongly acid; clear smooth boundary.
- Bhs—12 to 14 inches; very dark brown (7.5YR 2/2) sand; weak fine subangular blocky structure; very friable; many fine to coarse roots; strongly acid; clear wavy boundary.
- Bhsm—14 to 17 inches; very dark brown (7.5YR 2/2) sand; massive; very hard; ortstein makes up 100 percent of the horizon and is strongly cemented; ortstein occurs as a continuous layer with tongues that extend to a depth of 22 inches; few fine roots; strongly acid; clear irregular boundary.
- Bsm—17 to 27 inches; dark brown (7.5YR 3/4) sand; massive; very hard; ortstein makes up 100 percent of the horizon and is strongly cemented; ortstein occurs as a continuous layer with tongues that extend to a depth of 31 inches; strongly acid; clear irregular boundary.
- BC—27 to 34 inches; strong brown (7.5YR 4/6) sand; single grain; loose; common fine distinct strong brown (7.5YR 5/8) iron accumulations in the lower 2 inches; strongly acid; gradual wavy boundary.
- C—34 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; common coarse distinct strong brown (7.5YR 5/6) iron accumulations; moderately acid.

Pence Series

The Pence series consists of very deep, somewhat excessively drained soils on outwash plains. These soils formed in sandy deposits that have a thin loamy cap. Permeability is moderate or moderately rapid in the solum and rapid in the substratum. Slopes range from 0 to 45 percent.

Typical pedon of Pence loamy sand, 1,500 feet west and 2,000 feet south of the northeast corner of sec. 5, T. 46 N., R. 5 W., in Chippewa County, Michigan:

- A—0 to 1 inch; black (N 2/0) loamy sand, dark gray (N 4/0) dry; weak fine granular structure; very friable; many fine to coarse roots; about 5 percent gravel and 5 percent cobbles; very strongly acid; abrupt smooth boundary.
- E—1 to 4 inches; brown (7.5YR 5/2) loamy sand, pinkish gray (7.5YR 7/2) dry; weak medium subangular blocky structure; very friable; many fine and medium roots; about 5 percent gravel and 5 percent cobbles; very strongly acid; clear smooth boundary.
- Bhs—4 to 6 inches; dark reddish brown (5YR 3/2) sandy loam; weak medium and fine subangular blocky structure; very friable; many fine to coarse roots; about 5 percent gravel and 2 percent cobbles; strongly acid; clear smooth boundary.
- Bs—6 to 17 inches; dark brown (7.5YR 4/4) gravelly sandy loam; weak medium subangular blocky structure; very friable; common medium roots; about 10 percent gravel and 10 percent cobbles; strongly acid; clear wavy boundary.
- 2BC—17 to 28 inches; strong brown (7.5YR 4/6) sand and coarse sand; single grain; loose; common fine and medium roots; about 10 percent gravel; moderately acid; clear wavy boundary.
- 2C—28 to 80 inches; strong brown (7.5YR 5/6) gravelly coarse sand; single grain; loose; about 15 percent gravel; slightly acid.

Pickford Series

The Pickford series consists of very deep, poorly drained soils on lake plains and in depressions on moraines. These soils formed in clayey lacustrine material. Permeability is very slow. Slopes range from 0 to 2 percent.

Typical pedon of Pickford silty clay loam, 130 feet east and 570 feet south of the northwest corner of sec. 30, T. 46 N., R. 1 E., in Chippewa County, Michigan:

- Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 6/1) dry; moderate fine granular structure; friable; moderately acid; abrupt smooth boundary.
- Eg—8 to 10 inches; dark gray (10YR 4/1) silty clay loam; moderate fine subangular blocky structure; firm; common fine prominent yellowish brown (10YR 5/8) iron accumulations; many fine and medium roots; neutral; clear smooth boundary.
- Bg—10 to 16 inches; weak red (2.5YR 4/2) silty clay; moderate fine angular blocky structure; firm; many coarse prominent strong brown (7.5YR 5/8) iron accumulations and distinct dark gray (10YR 4/1) iron depletions; few fine roots; neutral; gradual wavy boundary.
- BCg—16 to 24 inches; weak red (2.5YR 4/2) clay; weak very fine angular blocky structure; very firm; common fine prominent strong brown (7.5YR 5/8) iron accumulations and distinct dark gray (10YR 4/1) iron depletions; slightly effervescent; slightly alkaline; clear smooth boundary.
- C—24 to 80 inches; reddish brown (2.5YR 4/4) clay; massive; very firm; common fine prominent yellowish red (5YR 5/8) iron accumulations; greenish gray (5GY 6/1) coatings of calcium carbonate on faces of peds; strongly effervescent; moderately alkaline.

Rousseau Series

The Rousseau series consists of very deep, excessively drained soils on dunes, lake plains, and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 60 percent.

Typical pedon of Rousseau fine sand, 2,560 feet west and 200 feet south of the northeast corner of sec. 26, T. 43 N., R. 16 W., in Schoolcraft County, Michigan:

- Oi—0 to 1 inch; partially decomposed forest litter.
- E—1 to 4 inches; dark gray (10YR 4/1) fine sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine and common medium and coarse roots; strongly acid; clear irregular boundary.
- Bs1—4 to 9 inches; brown (7.5YR 4/4) fine sand; weak medium subangular blocky structure; very friable; common fine and few medium and coarse roots; strongly acid; clear wavy boundary.
- Bs2—9 to 20 inches; strong brown (7.5YR 4/6) fine sand; weak fine subangular blocky structure; very friable; few fine to coarse roots between columns of ortstein; columns of moderately cemented, strong brown (7.5YR 5/8), brown (7.5YR 4/4), and pinkish gray (7.5YR 6/2) ortstein 3 to 10 inches wide and extending into the BC horizon; ortstein columns are 3 to 20 inches apart; ortstein makes up 30 percent of the horizon; strongly acid; clear wavy boundary.
- BC—20 to 33 inches; light yellowish brown (10YR 6/4) fine sand, very pale brown (10YR 7/3) dry; weak fine granular structure; very friable; few fine roots between columns of ortstein; columns of moderately cemented, strong brown (7.5YR 5/8), brown (7.5YR 4/4), and pinkish gray (7.5YR 6/2) ortstein 3 to 14 inches wide extending into this horizon; ortstein columns are 3 to 10 inches apart; ortstein makes up 30 percent of the horizon; strongly acid; abrupt wavy boundary.
- C1—33 to 66 inches; light yellowish brown (10YR 6/4) fine sand; single grain; loose; thin discontinuous strong brown (7.5YR 4/6) fine sand depositional bands $\frac{1}{16}$ to $\frac{1}{8}$ inch thick; about 1 percent fine gravel; moderately acid; clear irregular boundary.
- C2—66 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; about 1 percent fine gravel; moderately acid.

Rubicon Series

The Rubicon series consists of very deep, excessively drained soils on disintegration moraines, ground moraines, lake plains, outwash plains, and stream terraces. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 60 percent.

Typical pedon of Rubicon sand (fig. 15), 0 to 6 percent slopes, 1,914 feet east and 1,320 feet south of the northwest corner of sec. 1, T. 42 N., R. 16 W., in Schoolcraft County, Michigan:

- Oi—0 to 2 inches; slightly decomposed forest litter.
- E—2 to 7 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/1) dry; very weak medium granular structure; very friable; many fine and few medium roots; about 1 percent fine gravel; strongly acid; clear irregular boundary.
- Bs1—7 to 12 inches; dark brown (7.5YR 3/4) sand; weak medium granular structure; very friable; common fine and few medium roots; about 1 percent fine gravel; moderately acid; clear wavy boundary.
- Bs2—12 to 22 inches; strong brown (7.5YR 4/6) sand; weak medium granular structure; very friable; common fine and few medium roots; about 1 percent fine gravel; moderately acid; clear wavy boundary.
- Bs3—22 to 32 inches; strong brown (7.5YR 5/6) sand; single grain; loose; few fine roots between ortstein columns; columns of weakly cemented, dark reddish brown (5YR 3/3) and yellowish brown (10YR 5/6) ortstein 1 to 3 inches wide extend into the BC horizon; ortstein columns are 5 to 20 inches apart; ortstein makes up 15 percent of this horizon; about 1 percent fine gravel; moderately acid; clear irregular boundary.
- BC—32 to 40 inches; yellowish brown (10YR 5/6) sand; single grain; loose; few fine roots between ortstein columns; columns of weakly cemented, dark reddish brown (5YR 3/3) and yellowish brown (10YR 5/6) ortstein 1 to 3 inches wide extend into this horizon from the Bs3 horizon; ortstein columns are 5 to 30 inches apart; ortstein makes up 10 percent of this horizon; about 3 percent fine gravel; moderately acid; gradual wavy boundary.
- C1—40 to 50 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; few fine roots; about 3 percent fine gravel; slightly acid; gradual wavy boundary.
- C2—50 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; about 3 percent fine gravel; slightly acid.

Rudyard Series

The Rudyard series consists of very deep, somewhat poorly drained soils on lake plains. These soils formed in clayey lacustrine deposits. Permeability is very slow. Slopes range from 0 to 4 percent.

Typical pedon of Rudyard silty clay loam, 1,250 feet east and 300 feet north of the southwest corner of sec. 18, T. 46 N., R. 1 E., in Chippewa County, Michigan:

- Ap—0 to 6 inches; brown (10YR 4/3) silty clay loam, light gray (10YR 7/2) dry; weak medium subangular blocky structure; firm; many fine roots; neutral; abrupt smooth boundary.
- B/E—6 to 9 inches; about 90 percent brown (7.5YR 5/4) silty clay loam (Bt); few distinct reddish brown (5YR 4/3) clay films on faces of peds; surrounded by gray (10YR 5/1) and grayish brown (10YR 5/2) silt loam (E); moderate medium angular blocky structure; firm; common medium prominent dark grayish brown (10YR 4/2) and few fine prominent gray (10YR 5/1) iron depletions and many fine and medium distinct strong brown (7.5YR 5/6) iron accumulations; many fine roots; neutral; abrupt irregular boundary.



Figure 15.—Profile of Rubicon sand. This soil has a weak spodic horizon between the depths of 8 and 24 inches. The spodic horizon formed under a cover of trees and is an accumulation of iron, aluminum, and humus. Rubicon soils support pine trees and bigtooth aspen. Depth is marked in inches.

- Bt—9 to 17 inches; reddish brown (5YR 4/4) clay; moderate fine and very fine angular blocky structure; firm; many faint reddish brown (5YR 4/3) and prominent grayish brown (10YR 5/2) clay films on faces of peds; few fine and medium prominent strong brown (7.5YR 4/6) iron accumulations; few fine roots; neutral; gradual wavy boundary.
- C—17 to 80 inches; reddish brown (5YR 4/3) clay; massive; very firm; few coarse prominent strong brown (7.5YR 4/6) iron accumulations; common fine greenish

gray (5G 6/1) accumulations of calcium carbonate; strongly effervescent; moderately alkaline.

Solona Series

The Solona series consists of very deep, somewhat poorly drained soils on ground moraines. These soils formed in loamy till. Permeability is moderate. Slopes range from 0 to 3 percent.

Typical pedon of Solona fine sandy loam, 0 to 3 percent slopes, 250 feet south and 1,200 feet west of the northeast corner of sec. 9, T. 43 N., R. 26 W., in Marquette County, Michigan:

- A—0 to 6 inches; black (10YR 2/1) fine sandy loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine to coarse roots; about 4 percent gravel; neutral; clear wavy boundary.
- E—6 to 18 inches; brown (7.5YR 5/4) fine sandy loam, pink (7.5YR 7/4) dry; weak fine subangular blocky structure; friable; many very fine to coarse roots; common fine prominent light gray (10YR 7/2) iron depletions; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation; about 8 percent gravel and 2 percent cobbles; neutral; gradual wavy boundary.
- Bt—18 to 25 inches; brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few very fine and fine roots; common distinct reddish brown (5YR 4/4) clay films on faces of peds; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation; about 8 percent gravel and 2 percent cobbles; slightly alkaline; clear wavy boundary.
- C—25 to 80 inches; brown (7.5YR 5/4) gravelly fine sandy loam; massive with weakly expressed thick plates inherent from deposition; friable; few very fine and fine roots; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation; about 15 percent gravel and 4 percent cobbles; slightly effervescent; slightly alkaline.

Sporley Series

The Sporley series consists of very deep, well drained soils on moraines and till-floored lake plains. These soils formed in loamy glaciolacustrine deposits. Permeability is moderately slow. Slopes range from 6 to 60 percent.

Typical pedon of Sporley silt loam, 1,900 feet west and 2,600 feet north of the southeast corner of sec. 8, T. 46 N., R. 24 W., in Marquette County, Michigan:

- Oe—0 to 2 inches; black (N 2.5/0), partially decomposed forest litter; common fine and medium roots; moderately acid; abrupt smooth boundary.
- E—2 to 6 inches; reddish brown (5YR 5/3) silt loam, pinkish gray (5YR 7/2) dry; weak medium subangular blocky structure; friable; common very fine to coarse roots; moderately acid; abrupt wavy boundary.
- Bs1—6 to 10 inches; dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; moderately acid; clear wavy boundary.
- Bs2—10 to 16 inches; strong brown (7.5YR 4/6) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; moderately acid; clear wavy boundary.
- E/B—16 to 33 inches; about 60 percent dark reddish gray (5YR 4/2) very fine sandy loam, pinkish gray (7.5YR 6/2) dry (E); surrounding isolated remnants of reddish brown (5YR 4/4) silt loam (Bt); common distinct dark reddish brown (2.5YR 3/4) clay films on faces of peds and in root channels; moderate medium subangular

blocky structure; firm; few fine and medium roots; many very fine vesicular pores; slightly acid; gradual wavy boundary.

B/E—33 to 45 inches; about 60 percent reddish brown (5YR 4/4) silt loam (Bt); common distinct dark reddish brown (2.5YR 3/4) clay films on faces of peds and in root channels; surrounded by peds of dark reddish gray (5YR 4/2) very fine sandy loam (E), pinkish gray (5YR 6/2) dry; moderate medium subangular blocky structure; firm; few fine roots; many very fine vesicular pores; slightly acid; clear smooth boundary.

C—45 to 80 inches; stratified reddish brown (5YR 4/3) silt, reddish brown (5YR 5/4) silt loam, and dark reddish brown (2.5YR 3/4) silty clay; massive with weak thin plates inherent from deposition; firm; few very fine vesicular pores; strong effervescence; moderately alkaline.

Spot Series

The Spot series consists of very deep, poorly drained soils on outwash plains, lake plains, and ground moraines. These soils formed in sandy deposits. Permeability is moderate or moderately rapid in the upper part and in the ortstein layer and rapid in the rest of the profile. Slopes range from 0 to 2 percent.

Typical pedon of Spot peat (fig. 16), 1,550 feet west and 600 feet north of the southeast corner of sec. 27, T. 44 N., R. 9 W., in Mackinac County, Michigan:

Oi—0 to 1 inch; very dark brown (10YR 2/2) peat.

Oa—1 to 2 inches; muck, black (N 2/0) broken face and rubbed; moderate medium granular structure; friable; many fine to coarse roots; very strongly acid; abrupt smooth boundary.

E—2 to 8 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/1) dry; weak medium subangular blocky structure; friable; common fine and medium roots; common fine prominent strong brown (7.5YR 5/6) iron accumulations; very strongly acid; clear wavy boundary.

Bhsm—8 to 10 inches; dark reddish brown (5YR 3/3 and 3/2) sand; massive; very hard; ortstein makes up 90 percent of the horizon and is strongly cemented; ortstein occurs as a nearly continuous layer and as tongues that extend to a depth of 20 inches; common fine and medium roots; very strongly acid; clear irregular boundary.

Bs1—10 to 12 inches; dark brown (7.5YR 4/4) sand; weak fine subangular blocky structure; friable; ortstein makes up 70 percent of the horizon and is moderately cemented; dark brown (7.5YR 4/4) ortstein occurs as a nearly continuous layer with tongues extending to a depth of 22 inches; strongly acid; clear irregular boundary.

Bs2—12 to 18 inches; strong brown (7.5YR 4/6) sand; weak fine subangular blocky structure; friable; ortstein makes up 30 percent of the horizon and is weakly cemented; strong brown (7.5YR 4/4) ortstein occurs as tongues 2 to 6 inches wide extending to a depth of 25 inches; ortstein tongues are 16 to 30 inches apart; strongly acid; gradual wavy boundary.

C1—18 to 41 inches; light brown (7.5YR 6/4) sand; single grain; loose; strongly acid; gradual wavy boundary.

C2—41 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; moderately acid.



Figure 16.—Profile of Spot peat. This poorly drained soil has a continuous ortstein layer in the spodic horizon. The seasonal high water table is at or near the surface in the spring. Depth is marked in inches.

Springlake Series

The Springlake series consists of very deep, somewhat excessively drained soils on outwash plains, ground moraines, and beach ridges. These soils formed in sandy and gravelly deposits. Permeability is very rapid. Slopes range from 0 to 35 percent.

Typical pedon of Springlake loamy coarse sand, 3,000 feet north and 200 feet west of the southeast corner of sec. 30, T. 44 N., R. 7 W., in Mackinac County, Michigan:

Oi—0 to 1 inch; slightly decomposed leaf litter.

A—1 to 7 inches; very dark grayish brown (10YR 3/2) loamy coarse sand, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; very friable; many fine to coarse roots; moderately acid; clear irregular boundary.

E—7 to 9 inches; grayish brown (10YR 5/2) loamy coarse sand, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; very friable; many fine to

coarse roots; some mixing of material from the E and B horizons; moderately acid; clear smooth boundary.

Bhs—9 to 14 inches; dark brown (7.5YR 3/3) loamy coarse sand; weak fine subangular blocky structure; very friable; common fine and medium roots; moderately acid; clear wavy boundary.

Bs—14 to 23 inches; strong brown (7.5YR 4/6) loamy coarse sand; single grain; loose; common fine roots; about 5 percent gravel; neutral; clear wavy boundary.

2BC—23 to 26 inches; strong brown (7.5YR 5/6) gravelly coarse sand; single grain; loose; about 15 percent gravel; slightly alkaline; clear wavy boundary.

2C—26 to 80 inches; light yellowish brown (10YR 6/4) gravelly coarse sand; single grain; loose; about 15 percent gravel; strongly effervescent; moderately alkaline.

Sugar Series

The Sugar series consists of deep, moderately well drained soils on lake plains. These soils formed in loamy lacustrine sediments over calcareous clayey deposits. Permeability is moderate in the loamy upper part and very slow in the clayey material. Slopes range from 0 to 50 percent.

Typical pedon of Sugar very fine sandy loam, 2,380 feet south and 1,400 feet west of the northeast corner of sec. 1, T. 44 N., R. 3 W., in Chippewa County, Michigan:

Oa—0 to 1 inch; black (10YR 2/1), well decomposed forest litter; moderate medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

A—1 to 4 inches; black (10YR 2/1) very fine sandy loam, gray (10YR 5/1) dry; moderate medium granular structure; very friable; many fine to coarse roots; strongly acid; abrupt wavy boundary.

E—4 to 11 inches; pinkish gray (5YR 7/2) loamy very fine sand; weak medium and fine subangular blocky structure; very friable; common fine and medium roots; moderately acid; abrupt wavy boundary.

Bs1—11 to 12 inches; dark brown (7.5YR 4/4) very fine sandy loam; strong thick platy structure; firm; many fine and medium roots; moderately acid; clear wavy boundary.

Bs2—12 to 15 inches; strong brown (7.5YR 4/6) very fine sandy loam; strong thick platy structure; firm; many fine and medium roots; moderately acid; clear wavy boundary.

Bs3—15 to 20 inches; strong brown (7.5YR 5/8) very fine sandy loam; moderate medium platy structure; firm; common fine roots; slightly acid; clear smooth boundary.

Bw—20 to 27 inches; yellowish brown (10YR 5/6) and light brown (7.5YR 6/4) loamy very fine sand; moderate medium platy structure; firm; few fine roots; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulations; neutral; abrupt smooth boundary.

B/E—27 to 35 inches; reddish brown (5YR 5/4) silt loam (Bt); interfingering of white (5YR 8/1) loamy very fine sand (E); moderate medium angular blocky structure; firm; few faint reddish brown (5YR 5/4) clay films on vertical and horizontal faces of peds; few fine and medium roots; many fine and medium vesicular pores; few fine prominent strong brown (7.5YR 5/6) iron accumulations; slightly alkaline; abrupt smooth boundary.

2Bt—35 to 46 inches; reddish brown (5YR 5/4) silty clay loam; weak coarse prismatic structure parting to weak coarse angular blocky; firm; many faint reddish brown (5YR 5/4) clay films on vertical and horizontal faces of peds; few fine and medium roots; many fine vesicular pores; common fine prominent strong brown (7.5YR 5/6) iron accumulations; slightly alkaline; abrupt smooth boundary.

2C—46 to 80 inches; reddish brown (5YR 4/4) clay; thin bands of light reddish brown (5YR 6/3) silt loam; moderate fine angular blocky structure; firm; many fine vesicular pores; common thin pinkish gray (7.5YR 7/2) silt coatings on horizontal faces of pedis; slight effervescence; moderately alkaline.

Tawas Series

The Tawas series consists of very deep, very poorly drained soils in depressions and drainageways on outwash plains, till-floored lake plains, ground moraines, disintegration moraines, and bedrock-controlled moraines. These soils formed in organic material 16 to 50 inches thick overlying sandy deposits. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy part of the profile. Slopes range from 0 to 2 percent.

Typical pedon of Tawas muck, 2,400 feet east and 400 feet north of the southwest corner of sec. 1, T. 46 N., R. 20 W., in Alger County, Michigan:

- Oa1—0 to 5 inches; muck, black (N 2/0) broken face and rubbed; about 20 percent fiber, 5 percent rubbed; moderate very fine granular structure; very friable; many very fine to coarse roots; clear smooth boundary.
- Oa2—5 to 17 inches; muck, black (2.5Y 2.5/1) broken face and rubbed; about 40 percent fiber, 5 percent rubbed; weak medium blocky structure; very friable; few very fine to medium roots; strongly acid; gradual smooth boundary.
- Oa3—17 to 26 inches; muck, black (N 2/0) broken face and rubbed; about 20 percent fiber, 5 percent rubbed; massive; very friable; strongly acid; gradual smooth boundary.
- C—26 to 80 inches; dark brown (7.5YR 3/4) and light brownish gray (10YR 6/2) sand; single grain; loose; very friable; moderately acid.

Trenary Series

The Trenary series consists of very deep, well drained soils on ground moraines and end moraines. These soils formed in loamy deposits. Permeability is moderate. Slopes range from 0 to 35 percent.

Typical pedon of Trenary fine sandy loam, 190 feet south and 1,700 feet west of the northeast corner of sec. 4, T. 43 N., R. 21 W., in Delta County, Michigan:

- A—0 to 2 inches; very dark gray (5YR 3/1) fine sandy loam; weak medium granular structure; friable; about 2 percent gravel; moderately acid; abrupt wavy boundary.
- E—2 to 6 inches; brown (7.5YR 5/2) fine sandy loam, pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure; friable; about 2 percent gravel; moderately acid; abrupt wavy boundary.
- Bhs—6 to 12 inches; dark reddish brown (5YR 3/3) fine sandy loam; weak medium subangular blocky structure; friable; about 3 percent gravel; strongly acid; clear wavy boundary.
- Bs—12 to 17 inches; reddish brown (5YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; about 3 percent gravel; strongly acid; abrupt irregular boundary.
- E'—17 to 26 inches; reddish brown (5YR 5/3) sandy loam; weak thick platy structure; firm in place, friable disturbed; few fine vesicular pores; about 2 percent gravel and 2 percent cobbles; strongly acid; abrupt irregular boundary.
- Bt—26 to 37 inches; dark reddish brown (2.5YR 3/4) sandy clay loam; moderate coarse subangular blocky structure; firm; continuous clay flows in pores, on some

- faces of peds, and in root channels; about 2 percent gravel and 2 percent cobbles; moderately acid; abrupt wavy boundary.
- C1—37 to 48 inches; reddish brown (2.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; about 2 percent gravel and 3 percent cobbles; neutral; clear wavy boundary.
- C2—48 to 80 inches; reddish brown (2.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; about 2 percent gravel and 3 percent cobbles; slightly effervescent; moderately alkaline.

Vilas Series

The Vilas series consists of very deep, excessively drained soils on outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 15 percent.

Typical pedon of Vilas loamy sand, 2,350 feet east and 450 feet south of the northwest corner of sec. 9, T. 46 N., R. 12 W., in Luce County, Michigan:

- A—0 to 3 inches; black (7.5YR 2.5/1) loamy sand, dark gray (7.5YR 4/1) dry; weak fine subangular blocky structure; friable; common fine to coarse roots; 1 percent gravel; extremely acid; common charcoal fragments; abrupt wavy boundary.
- E—3 to 5 inches; brown (7.5YR 4/2) loamy sand, pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure; very friable; common fine to coarse roots; 1 percent gravel; extremely acid; abrupt wavy boundary.
- Bs1—5 to 9 inches; brown (7.5YR 4/4) loamy sand; weak fine and medium subangular blocky structure; very friable; few fine roots; 2 percent gravel; very strongly acid; clear wavy boundary.
- Bs2—9 to 20 inches; strong brown (7.5YR 4/6) sand; weak fine and medium subangular blocky structure; very friable; few fine roots; 2 percent gravel and 1 percent cobbles; strongly acid; gradual wavy boundary.
- C1—20 to 55 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; 2 percent gravel and 1 percent cobbles; strongly acid; abrupt wavy boundary.
- C2—55 to 63 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose; 4 percent gravel and 2 percent cobbles; strongly acid; abrupt wavy boundary.
- C3—63 to 80 inches; pale brown (10YR 6/3) sand; single grain; loose; 2 percent gravel; slightly acid.

Wallace Series

The Wallace series consists of very deep, well drained soils on lake plains and outwash plains. These soils formed in sandy deposits. Permeability is moderate or moderately rapid in the ortstein layer and rapid in the rest of the profile. Slopes range from 0 to 60 percent.

Typical pedon of Wallace sand (fig. 17), 100 feet west and 950 feet north of the southeast corner of sec. 12, T. 43 N., R. 9 W., in Mackinac County, Michigan:

- Oe—0 to 2 inches; partially decomposed leaf litter.
- E—2 to 10 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; many fine to coarse roots; very strongly acid; abrupt wavy boundary.
- Bhs—10 to 11 inches; dark reddish brown (5YR 3/2) sand; weak fine subangular blocky structure; very friable; many fine to coarse roots; very strongly acid; abrupt irregular boundary.



Figure 17.—Profile of Wallace sand. This soil has a continuous ortstein layer between the depths of 10 and 24 inches. The ortstein has a lower water-holding capacity than the rest of the profile and impairs the productivity of the soil. Depth is marked in inches.

- Bhsm—11 to 21 inches; dark brown (7.5YR 3/3) sand; massive; very hard; ortstein makes up 95 percent of the horizon and is strongly cemented; ortstein occurs as a nearly continuous layer and as tongues that extend to a depth of 52 inches; few fine and medium roots; strongly acid; clear irregular boundary.
- Bsm—21 to 26 inches; dark brown (7.5YR 4/4) sand; massive; hard; ortstein makes up 95 percent of the horizon and is moderately cemented; ortstein occurs as a nearly continuous layer and as tongues that extend to a depth of 55 inches; few fine and medium roots; strongly acid; clear irregular boundary.
- BC—26 to 59 inches; brownish yellow (10YR 6/6) sand; single grain; loose; few fine roots; moderately acid; gradual wavy boundary.
- C—59 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; moderately acid.

Whitewash Series

The Whitewash series consists of very deep, well drained soils on inactive flood plains. These soils formed in sandy alluvium. Permeability is rapid. Slopes range from 0 to 6 percent.

Typical pedon of Whitewash sand, 500 feet south of the northwest corner of sec. 7, T. 49 N., R. 12 W.; McMillan Township, Luce County, Michigan; USGS Grand Marais NE, Michigan, topographic quadrangle; lat. 46 degrees 39 minutes 47 seconds N. and long. 85 degrees 51 minutes 52 seconds W., NAD 83:

- Oe—0 to 3 inches; black (10YR 2/1), moderately decomposed plant material; weak medium granular structure; very friable; many fine to coarse roots; moderately acid; abrupt smooth boundary.
- C—3 to 7 inches; yellowish brown (10YR 5/4) sand; single grain; loose; common fine to coarse roots; slightly acid; abrupt smooth boundary.
- Ab—7 to 9 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- C¹—9 to 16 inches; dark grayish brown (10YR 4/2) loamy fine sand; massive; firm; few fine to coarse roots; very strongly acid; abrupt wavy boundary.
- C²—16 to 80 inches; 80 percent yellowish brown (10YR 5/4) sand; single grain; loose; 20 percent strata of brown (10YR 4/3) fine sandy loam up to 2 inches thick; strongly acid.

Widgeon Series

The Widgeon series consists of very deep, moderately well drained soils on moraines. These soils formed in loamy glaciofluvial deposits. Permeability is moderate in the upper part of the solum and moderately slow in the rest of the profile. Slopes range from 0 to 15 percent.

Typical pedon of Widgeon very fine sandy loam, 150 feet east and 2,400 feet north of the southwest corner of sec. 34, T. 47 N., R. 8 W., in Luce County, Michigan:

- Oe—0 to 2 inches; partially decomposed plant material; many fine to coarse roots; abrupt smooth boundary.
- A—2 to 5 inches; dark brown (10YR 3/3) very fine sandy loam, grayish brown (10YR 5/2) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- E—5 to 9 inches; brown (10YR 5/3) silt loam, light gray (10YR 7/2) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- Bhs—9 to 12 inches; dark brown (7.5YR 3/2) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear wavy boundary.
- Bs—12 to 16 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; abrupt wavy boundary.
- E/B—16 to 32 inches; 55 percent light brownish gray (10YR 6/2) silt loam (E), very pale brown (10YR 8/2) dry; surrounding reddish brown (5YR 5/4) silty clay loam (Bt); strong thick platy structure; friable; common fine and medium roots; few fine vesicular and tubular pores; few thin reddish brown (5YR 5/4) clay films along root channels; common fine prominent brown (7.5YR 4/4) masses of iron accumulation; very strongly acid; abrupt smooth boundary.
- 2C1—32 to 42 inches; stratified brown (10YR 5/3 and 7.5YR 5/4) silt loam and reddish brown (5YR 5/4) silty clay loam; strong thick platy structure; friable; few fine and

medium roots; common fine vesicular and tubular pores; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation along root channels; strongly acid; abrupt smooth boundary.

2C2—42 to 60 inches; stratified yellowish brown (10YR 5/4) very fine sandy loam and reddish brown (5YR 5/4) silty clay loam; strong thick platy structure; friable; few fine and medium roots; common fine vesicular and tubular pores; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation along root channels; extremely acid; abrupt smooth boundary.

2C3—60 to 80 inches; stratified pale brown (10YR 6/3) loamy very fine sand and very fine sandy loam and reddish brown (5YR 5/4) silty clay loam; strong thick platy structure inherent from deposition; friable; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid.

Zandi Series

The Zandi series consist of very deep, well drained soils on lake plains. These soils formed in loamy lacustrine deposits. Permeability is moderate. Slopes range from 6 to 35 percent.

Typical pedon of Zandi silt loam, 2,350 feet east and 2,400 feet north of the southwest corner of sec. 7, T. 46 N., R. 8 W., in Luce County, Michigan:

Oa—0 to 2 inches; well decomposed leaf litter; many fine to coarse roots; extremely acid; abrupt smooth boundary.

E—2 to 6 inches; brown (7.5YR 5/2) silt loam, light gray (10YR 7/1) dry; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear smooth boundary.

Bhs—6 to 7 inches; 90 percent dark brown (7.5YR 3/3) and 10 percent dark brown (7.5YR 3/2) silt loam; moderate medium subangular blocky structure; friable; many fine to coarse roots; extremely acid; clear smooth boundary.

Bs—7 to 12 inches; strong brown (7.5YR 4/6) very fine sandy loam; moderate medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.

Bw—12 to 22 inches; brown (7.5YR 5/4) very fine sandy loam; moderate medium subangular blocky structure; friable; few medium and coarse roots; very strongly acid; clear wavy boundary.

E&Bt—22 to 37 inches; brown (10YR 5/3) loamy very fine sand (E), light brownish gray (10YR 6/2) dry; brown (7.5YR 4/4) lamellae of very fine sandy loam (Bt); lamellae are $\frac{1}{8}$ to $\frac{1}{2}$ inch in thickness; weak medium platy structure; friable; strongly acid; gradual wavy boundary.

C—37 to 80 inches; stratified brown (7.5YR 5/4) very fine sand and strong brown (7.5YR 4/6) loamy very fine sand; massive; friable; strongly acid.

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area. It also describes the processes of soil formation.

Factors of Soil Formation

Soil forms through the interaction of five major factors. These are the physical, chemical, and mineral composition of the parent material; the climate under which the soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or topography; and the length of time that the processes of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the active forces of soil formation. They slowly change the parent material into a natural body of soil that has genetically related layers, called horizons. The effects of climate and plant and animal life are conditioned by relief. The nature of the parent material affects the kind of soil profile that is formed and in extreme cases determines it almost entirely. Finally, time changes the parent material into a soil. Generally, a long time is required for the formation of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made about the effect of any one factor unless conditions are specified for the other four. Many of the processes of soil formation are unknown.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The parent material of the soils in Luce County was deposited by glaciers or by meltwater from the glaciers. Some of this material was subsequently reworked by water and wind. The glaciers covered the county about 12,000 years ago. Parent material determines the chemical and mineralogical composition of the soil. Although the soils in the county have parent material of common glacial origin, the properties of the parent material vary greatly, sometimes within a small area, depending on how the material was deposited. The dominant parent materials in Luce County were deposited as glacial till, outwash material, lake sediment, alluvium, or organic material.

Glacial till is material that was deposited directly by glaciers with a minimum of water action. It consists of a mixture of particles of different sizes. The small pebbles in till have sharp corners, indicating that they have not been worn by water. The till in Luce County generally is calcareous sandy loam and loam. Ternary soils formed in glacial till. Typically, these soils are loamy and have moderately developed structure.

Outwash material was deposited by running water from melting glaciers. The size of the particles that make up outwash material depends on the speed of the water that carried them. When the water slows down, the coarser particles are deposited. The finer particles, such as very fine sand, silt, and clay, are carried by slowly moving water. Outwash deposits generally consist of layers of particles of similar size, such as sand, coarse sand, and gravel. Springlake soils are examples of soils that formed in outwash material.

Lake sediment is material that settled from still or slowly moving, deep lake water and from shallow, high-energy water near shorelines. Lake sediments are well sorted, and the size of the particles depends on the speed of the water that suspends them. Annanias soils are examples of silty soils that formed in parent material deposited on a shallow lake bottom. Pickford soils are examples of fine textured soils that formed in parent material deposited on a deep lake bottom.

Alluvium is material that has been deposited by floodwater of present streams in recent time. The texture of the deposited material depends on the speed of the water that deposited the material. Whitewash soils are examples of alluvial soils.

Organic material is made up of plant remains. After the glaciers receded from the area, water was left standing in depressions on outwash plains, flood plains, and till plains. Grasses and sedges that grew around the edge of these depressions died. Because of the wetness, when the plants died their remains did not decompose but accumulated around the edge of the depressions. Later, water-tolerant trees grew in these areas. As these trees died, their residue became part of the organic accumulation. Consequently, the depressions were eventually filled with organic material and developed into areas of muck. Lupton and Loxley soils are examples of soils that formed in organic material.

Plant and Animal Life

Green plants have been the principal type of organism influencing the soils in Luce County. Bacteria, fungi, earthworms, and humans also have been important. The chief contribution of plant and animal life is the addition of organic matter and nitrogen to the soil. The kind of organic matter on and in the soil depends on the kinds of plants that grew on the soil. The residue of these plants accumulates on the surface of the soil. It decays and eventually becomes organic matter. Plant roots provide channels for the downward movement of water through the soil and add organic material to the soil as they decay. Bacteria in the soil help to break down the organic material into a form that can be used by plants.

The native vegetation in Luce County was a mixture of coniferous and deciduous forest. Differences in natural soil drainage and changes in parent material affect the composition of forests.

In general, the well drained upland soils, such as Kalkaska and McMillan soils, were covered with sugar maple and white pine. Rubicon and Vilas soils were covered with red pine and jack pine. The very poorly drained soils were covered with cedar, black spruce, and aspen. Leafriver and Tawas soils, which formed under wet conditions, contain a considerable amount of organic matter.

Climate

Climate is important in the formation of soils. It determines the kind of plant and animal life on and in the soil and determines the amount of water available for the weathering of minerals and the transporting of soil materials. Through its influence of soil temperature, climate determines the rate of chemical reactions in the soil. These climatic influences generally affect areas larger than a county.

The climate in Luce County is cool and humid. Presumably, it is similar to the climate under which the soils formed. The soils in Luce County differ from soils that formed in a dry, warm climate or from those that formed in a moist, hot climate. Climate is uniform throughout the county, but its effect is modified locally by the proximity to Lake Superior. The minor differences in the soils in Luce County are partially the result of climatic differences.

Relief

Relief, or topography, has had a marked influence on the formation of the soils in Luce County through its influence on natural drainage, erosion, plant cover, and soil temperature. In this county, slopes range from 0 to 70 percent. Natural drainage classes range from excessively drained on hilltops to very poorly drained in depressions.

Relief influences the formation of soil by affecting runoff and drainage. Drainage in turn, through its effect on aeration of the soil, determines the color of the soil. Runoff is most rapid on the steeper slopes, but in low areas, water can be temporarily ponded.

Water and air move freely through well drained soils but slowly through very poorly drained soils. In soils that are well aerated, the iron and aluminum compounds that give most soils their color are brightly colored and are oxidized. Poorly aerated soils are dull gray and mottled. Ontonagon soils are examples of well drained, well aerated soils; Gogomain soils are examples of poorly drained, poorly aerated soils. Both soils formed in similar parent material.

Time

Generally, a long time is required for the development of distinct horizons in a soil. The differences in the length of time that the parent material has been in place are commonly reflected in the degree of development of the soil profile. Some soils form rapidly; others form slowly.

The soils of Luce County range from young to mature. The glacial deposits in which many of the soils formed have been exposed to soil-forming factors long enough for distinct horizons to develop. Some soils that formed in recent alluvial sediments have not been in place long enough for the development of distinct horizons. Whitewash soils, which formed in alluvial materials, are young soils. Menominee soils show the effects of leaching of lime from the soil, which has taken place over a long period of time.

Processes of Soil Formation

The processes responsible for the development of the soil horizons from unconsolidated parent material is referred to as soil genesis. Soil morphology describes the physical, chemical, and biological properties of these horizons.

Several processes were involved in the development of soil horizons in Luce County. These include the accumulation of organic matter; the leaching of lime (calcium carbonate) and other bases; the reduction and transfer of iron; and the formation and translocation of clay minerals. In most soils, more than one of these processes has been active in the development of horizons.

Organic matter accumulates at the surface to form an A horizon. If the soil is plowed, the A horizon is mixed into a plow layer, or Ap horizon. In the soils of Luce County, the content of organic matter in the surface layer ranges from high to low. For example, Trenary soils have a high content of organic matter in the surface layer, and Deerpark soils have a low content of organic matter.

Leaching of carbonates and other bases has occurred in most of the soils. Soil scientists generally agree that leaching of bases in soils precedes the translocation of clay minerals. Many of the soils in Luce County are moderately or strongly leached. Graveraet soils are leached of carbonates to a depth of more than 68 inches. Ontonagon soils are leached to a depth of more than 21 inches. This difference in the depth of leaching is a result of variations in relief, parent material, and the amount of time in which the factors of soil formation have been active.

The reduction and transfer of iron, a process called gleying, is evident in somewhat poorly drained, poorly drained, and very poorly drained soils. The gray or dull color in the subsoil indicates the reduction and loss of iron. Hendrie soils are examples of soils in which the gleying processes are evident.

Translocation of clay minerals has contributed to horizon development. An eluviated, or leached, E horizon above an illuviated B horizon has a lower content of clay than the B horizon and typically is lighter in color. The B horizon typically has an accumulation of clay and clay films in pores and on the faces of peds. The soils displaying this translocation of clay were probably leached of carbonates and soluble salts to a considerable extent before the translocation of clay took place. Leaching of bases and translocation of clays are among the more important processes in horizon differentiation. Millecoquins soils have translocated clay in the form of clay films accumulated in the B horizon.

In some soils, iron, aluminum, and humus have moved from the surface layer to the B horizon. The B horizon in such soils commonly is dark brown or dark reddish brown. Kalkaska and Spot soils are examples of soils in which translocated iron, aluminum, and humus have affected the B horizon.

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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.

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.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

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

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.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- 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.
- 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.
- 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.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- 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.”
- 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.
- 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.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.
- Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.
- 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.

- Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.
- Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”
- Drainage, surface.** Runoff, or surface flow of water, from an area.
- 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.
- 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 ridgelike accumulation of till that is being produced or has been produced at the outer margin 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.
- 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.
- Excess fines (in tables).** Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.
- Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.
- Fast intake (in tables).** The rapid movement of water into the soil.
- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity, or capillary capacity*.

- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- Flat.** A general term for a level or nearly level surface, or a small area of land marked by little or no relief.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Frost action** (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.
- Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that 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.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground moraine.** An extensive, fairly even layer of till having an uneven or undulating surface.
- 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.
- 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.
- Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An

explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

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.

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.

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.

Kame. An irregular, short ridge or hill of stratified drift.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain (geology). A nearly level surface marking the floor of an extinct lake filled by well sorted, coarse textured to fine textured, stratified sediments.

Lamellae. Thin layers in the soil in which illuviated clay particles have accumulated. The layers generally form in sandy soils and are commonly irregular or discontinuous.

Landform. An individual feature of the earth's surface. Large features include plateaus and mountains; small features include hills, dunes, kames, and hillslopes.

Landscape. A collection or population of landforms.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

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.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

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 mat. A zone of accumulation of organic material, such as leaves, twigs, and grasses, in various stages of decomposition. This zone lies above the mineral soil. It is often described in forest regions and is commonly called duff or forest litter.

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

Ortstein. A hardened mass or layer in the soil in which the cemented material consists of illuviated compounds of iron and aluminum and organic matter.

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

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.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

- Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.
- Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.
- Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.
- Poor filter** (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.
- Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.
- Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.
- Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.
- Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.
- Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

- Red beds.** Sedimentary strata that are mainly red and are made up largely of sandstone and shale.
- Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.
- Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.
- Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.
- Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts 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.

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.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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 complex slopes are as follows:

Level	0 to 2 percent
Nearly level	0 to 3 percent
Gently undulating	0 to 6 percent
Undulating	2 to 6 percent
Gently rolling	6 to 12 percent
Rolling	6 to 18 percent
Hilly	12 to 25 percent
Steep	18 to 45 percent
Very steep	45 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage 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.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terminal moraine. A belt of thick drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*,

silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

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.

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.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth’s surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry 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 Newberry, Michigan)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
°F	°F	°F	°F	°F	Units	In	In	In		In	
January----	23.0	7.2	15.1	42	-18	0	2.16	1.37	2.87	7	29.2
February---	25.5	7.5	16.5	44	-18	0	1.62	.83	2.32	5	20.6
March-----	34.9	16.7	25.8	57	-12	6	2.12	1.05	3.05	5	15.1
April-----	48.8	28.9	38.9	74	7	88	2.17	1.32	2.94	5	5.3
May-----	62.6	38.8	50.7	85	22	344	2.80	1.65	3.83	6	.4
June-----	70.8	46.9	58.9	88	30	566	3.21	1.65	4.58	7	.0
July-----	76.7	52.9	64.8	92	36	769	2.65	1.55	3.63	5	.0
August-----	73.7	52.4	63.0	88	36	714	3.70	2.20	5.05	7	.0
September--	64.8	45.2	55.0	83	27	450	3.65	2.13	5.00	7	.1
October----	53.4	36.3	44.8	74	19	192	3.04	1.94	4.04	7	1.1
November---	39.4	26.0	32.7	62	4	27	2.68	1.54	3.70	7	13.7
December---	27.3	13.4	20.3	48	-12	2	2.54	1.85	3.18	7	27.3
Yearly:											
Average---	50.1	31.0	40.5	---	---	---	---	---	---	---	---
Extreme---	97	-27	---	93	-20	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,158	32.36	28.41	35.93	75	112.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall
(Recorded in the period 1971-2000 at Newberry, Michigan)

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--	May 9	May 27	June 18
2 years in 10 later than--	May 4	May 22	June 12
5 years in 10 later than--	Apr. 24	May 11	May 31
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 8	Sept. 22	Sept. 6
2 years in 10 earlier than--	Oct. 14	Sept. 28	Sept. 12
5 years in 10 earlier than--	Oct. 25	Oct. 8	Sept. 23

Table 3.--Growing Season

(Recorded in the period 1971-2000 at Newberry, Michigan)

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	159	126	86
8 years in 10	167	134	96
5 years in 10	183	150	115
2 years in 10	198	165	134
1 year in 10	206	173	144

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
10D	Ontonagon silt loam, 6 to 15 percent slopes-----	506	*
15B	Liminga fine sand, 0 to 6 percent slopes-----	247	*
15D	Liminga fine sand, 6 to 15 percent slopes-----	444	*
15E	Liminga fine sand, 15 to 35 percent slopes-----	776	0.1
15F	Liminga fine sand, 35 to 60 percent slopes-----	232	*
16B	Graveraet fine sandy loam, 0 to 4 percent slopes-----	1,261	0.2
17C	Deer Park sand, 0 to 10 percent slopes-----	3,680	0.6
17E	Deer Park sand, 10 to 25 percent slopes-----	5,249	0.9
17F	Deer Park sand, 25 to 60 percent slopes-----	1,394	0.2
18B	Rubicon sand, 0 to 6 percent slopes-----	34,549	5.8
18D	Rubicon sand, 6 to 15 percent slopes-----	11,827	2.0
18E	Rubicon sand, 15 to 35 percent slopes-----	6,861	1.2
18F	Rubicon sand, 35 to 60 percent slopes-----	1,795	0.3
19B	Kalkaska sand, 0 to 6 percent slopes-----	25,932	4.4
19D	Kalkaska sand, 6 to 15 percent slopes-----	13,970	2.4
19E	Kalkaska sand, 15 to 35 percent slopes-----	10,556	1.8
19F	Kalkaska sand, 35 to 60 percent slopes-----	1,713	0.3
20B	Croswell sand, 0 to 6 percent slopes-----	766	0.1
21A	Finch sand, 0 to 3 percent slopes-----	545	*
22	Spot peat-----	486	*
23	Leafriver mucky peat-----	1,084	0.2
24B	Springlake loamy coarse sand, 0 to 6 percent slopes-----	523	*
29A	Solona fine sandy loam, 0 to 3 percent slopes-----	1,000	0.2
30	Kinross muck-----	783	0.1
31B	McMillan fine sandy loam, 0 to 6 percent slopes-----	3,236	0.5
31D	McMillan fine sandy loam, 6 to 15 percent slopes-----	1,128	0.2
31E	McMillan fine sandy loam, 15 to 35 percent slopes-----	1,241	0.2
31F	McMillan fine sandy loam, 35 to 60 percent slopes-----	231	*
32A	Allendale loamy fine sand, 0 to 3 percent slopes-----	171	*
33	Pits, sand and gravel-----	256	*
35	Histosols and Aquepts, ponded-----	20,360	3.4
36	Carbondale, Lupton, and Tawas soils-----	92,754	15.6
37	Dawson, Greenwood, and Loxley soils-----	44,295	7.5
45D	Rubicon-Spot complex, 0 to 15 percent slopes-----	2,465	0.4
45E	Rubicon-Spot complex, 0 to 35 percent slopes-----	2,299	0.4
46B	Kalkaska loamy sand, 0 to 6 percent slopes-----	17,235	2.9
46D	Kalkaska loamy sand, 6 to 15 percent slopes-----	2,623	0.4
46E	Kalkaska loamy sand, 15 to 35 percent slopes-----	2,081	0.4
46F	Kalkaska loamy sand, 35 to 60 percent slopes-----	348	*
47B	Trenary fine sandy loam, 2 to 6 percent slopes-----	304	*
47D	Trenary fine sandy loam, 6 to 15 percent slopes-----	304	*
53B	Menominee sand, sandy substratum, 2 to 6 percent slopes-----	26	*
57B	Amadon-Longrie sandy loams, 1 to 6 percent slopes, rocky-----	309	*
57D	Amadon-Longrie sandy loams, 6 to 15 percent slopes, rocky-----	338	*
57E	Amadon-Longrie sandy loams, 15 to 35 percent slopes, rocky-----	95	*
60A	Kinross-Au Gres complex, 0 to 3 percent slopes-----	4,881	0.8
61B	Paquin sand, 0 to 6 percent slopes-----	7,384	1.2
65B	Rubicon sand, organic surface, 0 to 6 percent slopes-----	672	0.1
65D	Rubicon sand, organic surface, 6 to 15 percent slopes-----	440	*
65E	Rubicon sand, organic surface, 15 to 35 percent slopes-----	614	0.1
66B	Kalkaska-Kaks complex, 0 to 6 percent slopes-----	747	0.1
66D	Kalkaska-Kaks complex, 6 to 15 percent slopes-----	1,207	0.2
66E	Kalkaska-Kaks complex, 15 to 35 percent slopes-----	3,477	0.6
66F	Kalkaska-Kaks complex, 35 to 60 percent slopes-----	748	0.1
74B	Menominee, sandy substratum-Graveraet complex, 0 to 6 percent slopes-----	3,856	0.6
75D	Dillingham-Kalkaska complex, 6 to 15 percent slopes-----	2,205	0.4
75E	Dillingham-Kalkaska complex, 15 to 35 percent slopes-----	2,196	0.4
75F	Dillingham-Kalkaska complex, 35 to 70 percent slopes-----	2,347	0.4
76D	Menominee, sandy substratum-Trenary complex, 6 to 15 percent slopes-----	1,730	0.3
76E	Menominee, sandy substratum-Trenary complex, 15 to 35 percent slopes-----	423	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
84B	Liminga-Alcona complex, 0 to 6 percent slopes-----	2,876	0.5
84D	Liminga-Alcona complex, 6 to 15 percent slopes-----	2,175	0.4
84E	Liminga-Alcona complex, 15 to 35 percent slopes-----	1,217	0.2
85B	Kalkaska-Okeefe sands, 0 to 6 percent slopes-----	535	*
85D	Kalkaska-Okeefe sands, 6 to 15 percent slopes-----	457	*
85E	Kalkaska-Okeefe sands, 15 to 35 percent slopes-----	884	0.1
88B	Croswell-Au Gres sands, 0 to 6 percent slopes-----	717	0.1
89A	Spot-Finch complex, 0 to 3 percent slopes-----	14,918	2.5
90D	Rousseau-Spot complex, 0 to 15 percent slopes-----	2,498	0.4
90E	Rousseau-Spot complex, 0 to 35 percent slopes-----	5,353	0.9
90F	Rousseau-Spot complex, 0 to 60 percent slopes-----	374	*
91D	Rousseau fine sand, 6 to 15 percent slopes-----	566	*
91E	Rousseau fine sand, 15 to 35 percent slopes-----	3,044	0.5
91F	Rousseau fine sand, 35 to 60 percent slopes-----	998	0.2
93F	Ontonagon-Pickford, occasionally flooded, complex, 0 to 50 percent slopes-----	329	*
94A	Tawas-Spot-Finch complex, 0 to 3 percent slopes-----	8,915	1.5
102	Spot-Dawson peats-----	9,442	1.6
104B	Pence very fine sandy loam, 0 to 6 percent slopes-----	777	0.1
104D	Pence very fine sandy loam, 6 to 15 percent slopes-----	466	*
104E	Pence very fine sandy loam, 15 to 35 percent slopes-----	75	*
109D	Rousseau-Dawson complex, 0 to 15 percent slopes-----	1,483	0.2
109F	Rousseau-Dawson complex, 0 to 60 percent slopes-----	2,664	0.4
110D	Au Gres-Dawson-Rubicon complex, 0 to 15 percent slopes-----	2,534	0.4
110E	Au Gres-Dawson-Rubicon complex, 0 to 35 percent slopes-----	287	*
116	Udipsamments and Udorthents, nearly level-----	266	*
117D	Manistee sand, sandy substratum, 6 to 15 percent slopes-----	64	*
120B	McMillan-Trenary fine sandy loams, 1 to 6 percent slopes-----	1,486	0.3
120D	McMillan-Trenary fine sandy loams, 6 to 15 percent slopes-----	736	0.1
120E	McMillan-Trenary fine sandy loams, 15 to 35 percent slopes-----	799	0.1
122	Pits, quarry-----	11	*
126	Pickford silt loam-----	4,500	0.8
129A	Rudyard silt loam, 0 to 3 percent slopes-----	2,334	0.4
130A	Rudyard-Pickford silt loams, 0 to 3 percent slopes-----	796	0.1
132B	Sugar very fine sandy loam, 0 to 6 percent slopes-----	1,031	0.2
133	Dorval muck-----	890	0.2
143	Caffey muck-----	712	0.1
146A	Allendale-Fibre complex, 0 to 3 percent slopes-----	1,150	0.2
167D	Battydoe, stony-Wallace complex, 6 to 15 percent slopes-----	17	*
173B	Paquin-Finch sands, 0 to 6 percent slopes-----	5,691	1.0
174B	Croswell-Spot complex, 0 to 6 percent slopes-----	3,558	0.6
175D	Wallace-Spot complex, 0 to 15 percent slopes-----	5,351	0.9
175E	Wallace-Spot complex, 0 to 35 percent slopes-----	6,324	1.1
176B	Paquin-Spot complex, 0 to 6 percent slopes-----	8,730	1.5
179B	Wallace sand, 0 to 6 percent slopes-----	15,011	2.5
179D	Wallace sand, 6 to 15 percent slopes-----	8,557	1.4
179E	Wallace sand, 15 to 35 percent slopes-----	8,422	1.4
179F	Wallace sand, 35 to 60 percent slopes-----	1,523	0.3
180B	Millecoquins silt loam, 0 to 6 percent slopes-----	1,629	0.3
186D	Sporley silt loam, 6 to 15 percent slopes-----	1,938	0.3
186E	Sporley silt loam, 15 to 35 percent slopes-----	2,914	0.5
186F	Sporley silt loam, 35 to 60 percent slopes-----	901	0.2
187B	Auger silt loam, 0 to 6 percent slopes-----	1,657	0.3
188	Hendrie mucky peat-----	3,193	0.5
189A	Bodi-Chesbrough silt loams, 0 to 3 percent slopes-----	1,756	0.3
190B	Bodi silt loam, 0 to 6 percent slopes-----	1,274	0.2
191D	Widgeon-Kalkaska complex, 6 to 15 percent slopes-----	1,229	0.2
193A	Annianias silt loam, 0 to 3 percent slopes-----	767	0.1
194A	Hendrie-Annianias complex, 0 to 3 percent slopes-----	10,747	1.8
195A	Chesbrough silt loam, 0 to 3 percent slopes-----	170	*
197D	Zandi silt loam, 6 to 15 percent slopes-----	2,028	0.3
197E	Zandi silt loam, 15 to 35 percent slopes-----	1,032	0.2
198B	Vilas loamy sand, 0 to 6 percent slopes-----	6,052	1.0

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
198D	Vilas loamy sand, 6 to 15 percent slopes-----	569	*
199B	Auger-Annianias silt loams, 0 to 6 percent slopes-----	6,137	1.0
200B	Pence loamy sand, 0 to 6 percent slopes-----	633	0.1
200D	Pence loamy sand, 6 to 15 percent slopes-----	410	*
200E	Pence loamy sand, 15 to 35 percent slopes-----	114	*
201B	Croswell, rarely flooded-Deford, frequently flooded, complex, 0 to 6 percent slopes-----	1,728	0.3
202B	Whitewash sand, 0 to 4 percent slopes-----	304	*
203D	Frohling loamy sand, 8 to 15 percent slopes-----	148	*
203E	Frohling loamy sand, 15 to 35 percent slopes-----	205	*
204	Gogomain muck-----	4,884	0.8
205B	Kalkaska sand, 0 to 6 percent slopes, burned-----	6,829	1.2
205D	Kalkaska sand, 6 to 15 percent slopes, burned-----	845	0.1
206B	Deerton loamy sand, 0 to 6 percent slopes-----	1,194	0.2
211D	Frohling-Wallace complex, 6 to 15 percent slopes-----	192	*
211E	Frohling-Wallace complex, 15 to 35 percent slopes-----	278	*
212	Markey mucky peat-----	17,391	2.9
214D	Rousseau-Markey complex, 0 to 15 percent slopes-----	1,205	0.2
214E	Rousseau-Markey complex, 0 to 35 percent slopes-----	148	*
215B	Wallace-Alcona complex, 0 to 6 percent slopes-----	270	*
215D	Wallace-Alcona complex, 6 to 15 percent slopes-----	193	*
246B	Garlic sand, 0 to 6 percent slopes-----	270	*
246D	Garlic sand, 6 to 15 percent slopes-----	86	*
286B	Fence silt loam, 0 to 6 percent slopes-----	1,184	0.2
287B	Noseum fine sandy loam, 0 to 4 percent slopes-----	764	0.1
300	Beaches-----	596	0.1
W	Water-----	16,707	2.8
	Total-----	593,319	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
29A	Solona fine sandy loam, 0 to 3 percent slopes (where drained)
47B	Trenary fine sandy loam, 2 to 6 percent slopes
104B	Pence very fine sandy loam, 0 to 6 percent slopes
132B	Sugar very fine sandy loam, 0 to 6 percent slopes
180B	Millecoquins silt loam, 0 to 6 percent slopes
286B	Fence silt loam, 0 to 6 percent slopes

Table 6.--Land Capability and Yields Per Acre of Crops and Hay

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Only the soils that are commonly used for crops are listed. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Alfalfa hay	Grass-legume hay	Oats	Irish potatoes
		Tons	Tons	Bu	Cwt
29A----- Solona	2w	---	3.5	70	---
31B----- McMillan	3s	---	2.5	50	250
46B----- Kalkaska	3s	---	4.0	---	250
47B----- Trenary	2e	4.5	3.3	60	300
47D----- Trenary	4e	4.5	3.3	60	300
120B----- McMillan----- Trenary-----	3s 2e	---	2.5	50	250

Table 7.--Woodland Management and Productivity

(Only the soils that are used as woodland are listed. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for further explanation of ratings in this table)

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
10D: Ontonagon-----	Moderate: Slope	Well suited	Severe: Rooting depth	Low	American basswood--- Balsam fir----- Eastern hemlock---- Eastern white pine-- Northern whitecedar Red maple----- Sugar maple----- White spruce----- Yellow birch-----	--- --- 44 --- 55 --- --- ---	--- --- 72 --- 35 --- ---	Eastern white pine, white spruce.
15B: Liminga-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
15D: Liminga-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
15E: Liminga-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
15F: Liminga-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
16B: Graveraet-----	Slight	Well suited	Severe: Rooting depth Wetness	Moderate: Wetness	American beech----- Balsam fir----- Eastern hemlock---- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	--- --- --- --- 65 --- ---	--- --- --- --- 40 ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
17C: Deer Park-----	Slight	Well suited	Slight	Moderate: Droughty	Black cherry----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red pine-----	--- --- 46 --- --- --- 45	--- --- 57 --- --- --- 64	Jack pine, red pine.
17E: Deer Park-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Black cherry----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red pine-----	--- --- 46 --- --- --- 45	--- --- 57 --- --- --- 64	Jack pine, red pine.
17F: Deer Park-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	Black cherry----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red pine-----	--- --- 46 --- --- --- 45	--- --- 57 --- --- --- 64	Jack pine, red pine.
18B: Rubicon-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.
18D: Rubicon-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.
18E: Rubicon-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
18F: Rubicon-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.
19B: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
19D: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
19E: Kalkaska-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
19F: Kalkaska-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
20B: Croswell-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	69 --- 53 --- 54 68 --- 55	80 --- 73 --- 55 78 --- 88	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
21A: Finch-----	Slight	Poorly suited: Restrictive layer	Moderate: Wetness	High: Wetness	Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	53 52 54 56 56 56	100 72 55 57 36 88	Eastern white pine, red pine, tamarack, white spruce.
22: Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
23: Leafriver----	Slight	Poorly suited: Wetness	Moderate: Wetness	High: Wetness	Black spruce----- Eastern arborvitae-- Quaking aspen----- Tamarack-----	--- --- 45 ---	--- --- 32 ---	---
24B: Springlake----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hophornbeam Quaking aspen----- Red pine----- Sugar maple----- White ash-----	--- --- 70 71 60 ---	--- --- 81 131 38 ---	Eastern white pine, red pine.
29A: Solona-----	Slight	Well suited	Moderate: Wetness	High: Wetness	American basswood--- Red maple----- Sugar maple----- White ash----- White spruce-----	--- --- 64 --- ---	--- --- 40 --- ---	Eastern white pine, white spruce.
30: Kinross-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Eastern white pine-- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- Tamarack-----	--- --- --- --- --- --- 45 --- ---	--- --- --- --- --- --- 32 --- ---	---
31B: McMillan-----	Slight	Well suited	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
31D: McMillan-----	Slight	Well suited	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.
31E: McMillan-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.
31F: McMillan-----	Severe: Slope	Unsuited: Slope	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.
32A: Allendale-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- White spruce-----	--- --- --- 60 --- --- ---	--- --- --- 64 --- --- ---	Eastern white pine, red pine, white spruce.
36: Carbondale-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Northern whitecedar	40 15 ---	59 23 ---	---
Lupton-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Northern whitecedar Paper birch----- Red maple----- Tamarack-----	--- --- --- --- --- ---	--- --- --- --- --- ---	---
Tawas-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Northern whitecedar	--- 15 40	--- 23 59	---
37: Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	23 ---	---
Greenwood-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	23 ---	---
Loxley-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	23 ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
45D: Rubicon-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
45E: Rubicon-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 82	Eastern white pine, jack pine, red pine.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
46B: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- 68 62	--- --- --- --- 123 39	Eastern white pine, red pine.
46D: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- 68 62	--- --- --- --- 123 39	Eastern white pine, red pine.
46E: Kalkaska-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- 68 62	--- --- --- --- 123 39	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
46F: Kalkaska-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- 68 62	--- --- --- --- 123 39	Eastern white pine, red pine.
47B: Trenary-----	Slight	Well suited	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 59 --- ---	Eastern white pine, red pine, white spruce.
47D: Trenary-----	Slight	Well suited	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 59 --- ---	Eastern white pine, red pine, white spruce.
53B: Menominee, sandy substratum---	Slight	Well suited	Slight	Moderate: Droughty	American basswood--- Balsam fir----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 64	--- --- --- --- --- 40	Eastern white pine, red pine, white spruce.
57B: Amadon-----	Slight	Well suited	Severe: Rooting depth	Moderate: Droughty	American beech----- Balsam fir----- Eastern white pine-- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- --- --- 57	--- --- --- --- --- --- --- --- 36	Eastern white pine, red pine.
Longrie-----	Slight	Well suited	Slight	Low	American basswood--- American beech----- Balsam fir----- Black cherry----- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	64 --- --- --- --- 61 --- ---	57 --- --- --- --- 38 --- ---	Eastern white pine, red pine, white spruce.
Rock outcrop.								

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
57D: Amadon-----	Slight	Well suited	Severe: Rooting depth	Moderate: Droughty	American beech----- Balsam fir----- Eastern white pine-- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- --- --- 57	--- --- --- --- --- --- --- --- 36	Eastern white pine, red pine.
Longrie-----	Slight	Well suited	Slight	Low	American basswood--- American beech----- Balsam fir----- Black cherry----- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	64 --- --- --- --- 61 --- ---	57 --- --- --- --- 38 --- ---	Eastern white pine, red pine, white spruce.
Rock outcrop.								
57E: Amadon-----	Moderate: Slope	Poorly suited: Slope	Severe: Rooting depth	Moderate: Droughty	American beech----- Balsam fir----- Eastern white pine-- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- --- --- 57	--- --- --- --- --- --- --- --- 36	Eastern white pine, red pine.
Longrie-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American basswood--- American beech----- Balsam fir----- Black cherry----- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	64 --- --- --- --- 61 --- ---	57 --- --- --- --- 38 --- ---	Eastern white pine, red pine, white spruce.
Rock outcrop.								
60A: Kinross-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Eastern white pine-- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- Tamarack-----	--- --- --- --- --- --- 45 --- ---	--- --- --- --- --- --- 32 --- ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
60A: Au Gres-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Eastern white pine-- Jack pine----- Quaking aspen----- Red maple----- Red pine-----	--- --- --- 51 --- --- 61	--- --- --- 69 --- --- 104	Eastern white pine, red pine, white spruce.
61B: Paquin-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	American beech----- Black cherry----- Eastern hemlock----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 64 67 58 ---	--- --- --- --- --- 40 120 37 ---	Eastern white pine, red pine, white spruce.
65B: Rubicon, organic surface-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern hemlock----- Eastern white pine-- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 66 --- 49 --- --- 62 57 55	--- 75 --- 87 --- --- 68 36 88	Eastern white pine, jack pine, red pine.
65D: Rubicon, organic surface-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern hemlock----- Eastern white pine-- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 66 --- 49 --- --- 62 57 55	--- 75 --- 87 --- --- 68 36 88	Eastern white pine, jack pine, red pine.
65E: Rubicon, organic surface-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern hemlock----- Eastern white pine-- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 66 --- 49 --- --- 62 57 55	--- 75 --- 87 --- --- 68 36 88	Eastern white pine, jack pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
66B: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Kaks-----	Slight	Well suited	Slight	Low	American basswood--- American beech----- Eastern hemlock----- Eastern hophornbeam Quaking aspen----- Sugar maple----- White ash-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine.
66D: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Kaks-----	Slight	Well suited	Slight	Low	American basswood--- American beech----- Eastern hemlock----- Eastern hophornbeam Quaking aspen----- Sugar maple----- White ash-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine.
66E: Kalkaska-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Kaks-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American basswood--- American beech----- Eastern hemlock----- Eastern hophornbeam Quaking aspen----- Sugar maple----- White ash-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
66F: Kalkaska-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Kaks-----	Severe: Slope	Unsuited: Slope	Slight	Low	American basswood--- American beech----- Eastern hemlock----- Eastern hophornbeam Quaking aspen----- Sugar maple----- White ash-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine.
74B: Menominee, sandy substratum---	Slight	Well suited	Slight	Moderate: Droughty	American basswood--- Balsam fir----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 64	--- --- --- --- --- 40	Eastern white pine, red pine, white spruce.
Graveraet-----	Slight	Well suited	Severe: Rooting depth Wetness	Moderate: Wetness	American beech----- Balsam fir----- Eastern hemlock----- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	--- --- --- --- 65 --- ---	--- --- --- --- 40 --- ---	Eastern white pine, red pine, white spruce.
75D: Dillingham----	Slight	Well suited	Severe: Rooting depth	Low	American beech----- Balsam fir----- Black cherry----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	60 --- --- --- --- --- --- --- 62	38 --- --- --- --- --- --- --- 39	Eastern white pine, red pine.
Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
75E: Dillingham----	Moderate: Slope	Poorly suited: Slope	Severe: Rooting depth	Low	American beech----- Balsam fir----- Black cherry----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	60 --- --- --- --- --- --- --- 62	38 --- --- --- --- --- --- --- 39	Eastern white pine, red pine.
Kalkaska-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
75F: Dillingham----	Severe: Slope	Unsuited: Slope	Severe: Rooting depth	Low	American beech----- Balsam fir----- Black cherry----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	60 --- --- --- --- --- --- --- 62	38 --- --- --- --- --- --- --- 38	Eastern white pine, red pine.
Kalkaska-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
76D: Menominee, sandy substratum---	Slight	Well suited	Slight	Moderate: Droughty	American basswood-- Balsam fir----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 64	--- --- --- --- --- 40	Eastern white pine, red pine, white spruce.
Trenary-----	Slight	Well suited	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood-- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 59 --- ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
76E: Menominee, sandy substratum---	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American basswood--- Balsam fir----- Eastern hemlock---- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 64	--- --- --- --- --- 40	Eastern white pine, red pine, white spruce.
Trenary-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	Sugar maple----- Eastern hemlock---- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 59 --- ---	Eastern white pine, red pine, white spruce.
84B: Liminga-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
Alcona-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
84D: Liminga-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
Alcona-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
84E: Liminga-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- --- 60	--- --- --- --- --- --- 38	Eastern white pine, red pine.
Alcona-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
85B: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Okeefe-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 62	--- --- --- --- --- 39	Red pine, white spruce.
85D: Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
Okeefe-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Eastern hemlock----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 62	--- --- --- --- --- 39	Red pine, white spruce.
85E: Kalkaska-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
85E: Okeefe-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	American beech----- Eastern hemlock----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- --- 62	--- --- --- --- --- 39	Red pine, white spruce.
88B: Croswell-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak----- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	69 --- 53 --- 54 68 --- 55	80 --- 73 --- 55 78 --- 88	Eastern white pine, red pine, white spruce.
Au Gres-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Eastern white pine-- Jack pine----- Quaking aspen----- Red maple----- Red pine-----	--- --- --- 51 --- --- 61	--- --- --- 69 --- --- 104	Eastern white pine, red pine, white spruce.
89A: Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
Finch-----	Slight	Poorly suited: Restrictive layer	Moderate: Wetness	High: Wetness	Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	53 52 54 56 56 56	100 72 55 57 36 88	Eastern white pine, red pine, tamarack, white spruce.
90D: Rousseau-----	Slight	Well suited	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak----- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
90E: Rousseau-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
90F: Rousseau-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
91D: Rousseau-----	Slight	Well suited	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
91E: Rousseau-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
91F: Rousseau-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
93F: Ontonagon-----	Severe: Slope	Unsuited: Slope	Moderate: Rooting depth	Low	American basswood--- Balsam fir----- Eastern hemlock----- Eastern white pine-- Northern whitecedar Red maple----- Sugar maple----- White spruce----- Yellow birch-----	--- --- --- 44 --- 55 --- --- ---	--- --- --- 72 --- 35 --- --- ---	Eastern white pine, white spruce.
Pickford, occasionally flooded-----	Slight	Poorly suited: Wetness Stickiness	Moderate: Wetness	High: Wetness	Balsam fir----- Balsam poplar----- Black ash----- Paper birch----- Quaking aspen----- White spruce-----	45 --- --- --- --- 45	83 --- --- --- --- 84	---
94A: Tawas-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Black spruce----- Northern whitecedar	--- 15 40	--- 23 59	---
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
Finch-----	Slight	Poorly suited: Restrictive layer	Moderate: Wetness	High: Wetness	Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	53 52 54 56 56 56	100 72 55 57 36 88	Eastern white pine, red pine, tamarack, white spruce.
102: Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	23 ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
104B: Pence-----	Slight	Well suited	Slight	Low	Balsam fir----- Bigtooth aspen----- Black cherry----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 70 --- 63 ---	--- --- --- --- 81 --- 39 ---	Eastern white pine, red pine.
104D: Pence-----	Slight	Well suited	Slight	Low	Balsam fir----- Bigtooth aspen----- Black cherry----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 70 --- 63 ---	--- --- --- --- 81 --- 39 ---	Eastern white pine, red pine.
104E: Pence-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	Balsam fir----- Bigtooth aspen----- Black cherry----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 70 --- 63 ---	--- --- --- --- 81 --- 39 ---	Eastern white pine, red pine.
109D: Rousseau-----	Slight	Well suited	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	22 ---	---
109F: Rousseau-----	Severe: Slope	Unsuited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak--- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	22 ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
110D: Au Gres-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock---- Eastern white pine-- Jack pine----- Quaking aspen----- Red maple----- Red pine-----	--- --- --- 51 --- --- 61	--- --- --- 69 --- --- 104	Eastern white pine, red pine, white spruce.
Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	22 ---	---
Rubicon-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 73	Eastern white pine, jack pine, red pine.
110E: Au Gres-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock---- Eastern white pine-- Jack pine----- Quaking aspen----- Red maple----- Red pine-----	--- --- --- 51 --- --- 61	--- --- --- 69 --- --- 104	Eastern white pine, red pine, white spruce.
Dawson-----	Slight	Unsuited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack-----	15 ---	22 ---	---
Rubicon-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	66 45 53 --- --- 60 57 53	75 75 73 --- --- 64 36 73	Eastern white pine, jack pine, red pine.
117D: Manistee, sandy substratum---	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern hemlock---- Eastern white pine-- Red maple----- Red pine----- Sugar maple-----	74 --- --- --- --- 61	86 --- --- --- --- 38	Eastern white pine, red pine.
120B: McMillan-----	Slight	Well suited	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
120B: Trenary-----	Slight	Well suited	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 46 --- ---	Eastern white pine, red pine, white spruce.
120D: McMillan-----	Slight	Well suited	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.
Trenary-----	Slight	Well suited	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 46 --- ---	Eastern white pine, red pine, white spruce.
120E: McMillan-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	Sugar maple----- American beech----- Eastern hophornbeam American basswood--- White ash----- Yellow birch----- Quaking aspen-----	61 --- --- --- --- --- 70	38 --- --- --- --- --- 81	Eastern white pine, red pine, white spruce.
Trenary-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	Sugar maple----- Eastern hemlock----- Yellow birch----- Red maple----- White spruce----- Balsam fir----- American basswood--- White ash----- Quaking aspen-----	61 --- 61 --- --- --- 65 --- ---	38 --- 38 --- --- --- 46 --- ---	Eastern white pine, red pine, white spruce.
126: Pickford-----	Slight	Poorly suited: Wetness Stickiness	Severe: Wetness	High: Wetness	Balsam fir----- Balsam poplar----- Black ash----- Paper birch----- Quaking aspen----- White spruce-----	45 --- --- --- --- 45	83 --- --- --- --- 84	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant	
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*		
129A: Rudyard-----	Slight	Poorly suited: Stickiness	Severe: Rooting depth Wetness	High: Wetness	Balsam fir----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- White spruce-----	45 --- --- --- --- 45	83 --- --- --- --- 84	Eastern white pine, white spruce.	
130A: Rudyard-----	Slight	Poorly suited: Stickiness	Severe: Rooting depth Wetness	High: Wetness	Balsam fir----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- White spruce-----	45 --- --- --- --- 45	83 --- --- --- --- 84	Eastern white pine, white spruce.	
Pickford-----	Slight	Poorly suited: Wetness Stickiness	Severe: Wetness	High: Wetness	Balsam fir----- Balsam poplar----- Black ash----- Paper birch----- Quaking aspen----- White spruce-----	45 --- --- --- --- 45	83 --- --- --- --- 84	---	
132B: Sugar-----	Slight	Well suited	Moderate: Wetness	Moderate: Wetness	Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple-----	--- --- --- --- 62	--- --- --- --- 38	Eastern white pine, red pine, white spruce.	
133: Dorval-----	Slight	Poorly suited: Wetness Stickiness	Severe: Wetness	High: Wetness	Balsam fir----- Black ash----- Black spruce----- Northern whitecedar Tamarack-----	40 --- --- 30 45	71 --- --- 42 35	---	
143: Caffey-----	Slight	Well suited	Severe: Wetness	High: Wetness	Balsam fir----- Bigtooth aspen----- Black ash----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple-----	--- --- --- --- --- 40 ---	--- --- --- --- --- 22 ---	---	
146A: Allendale-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- White spruce-----	--- --- --- 60 --- ---	--- --- --- 64 --- ---	Eastern white pine, red pine, white spruce.	
Fibre-----	Slight	Poorly suited: Wetness	Moderate: Wetness	High: Wetness	Balsam fir----- Black spruce----- Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- ---	--- 39 --- --- ---	50 ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
167D: Battydoe-----	Slight	Well suited	Slight	Low	American basswood---	---	---	Eastern white pine, red pine, white spruce.
					American beech-----	---	---	
					Eastern hemlock-----	---	---	
					Sugar maple-----	66	41	
					White ash-----	---	---	
					Yellow birch-----	---	---	
Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir-----	---	---	Eastern white pine, red pine, white spruce.
					Eastern hemlock-----	---	---	
					Eastern white pine--	52	96	
					Paper birch-----	---	---	
					Quaking aspen-----	75	87	
					Red maple-----	---	---	
					Red pine-----	59	99	
					Sugar maple-----	---	---	
173B: Paquin-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	American beech-----	---	---	Eastern white pine, red pine, white spruce.
					Black cherry-----	---	---	
					Eastern hemlock-----	---	---	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
					Red maple-----	64	40	
					Red pine-----	67	120	
					Sugar maple-----	58	37	
					Yellow birch-----	---	---	
Finch-----	Slight	Poorly suited: Restrictive layer	Moderate: Wetness	High: Wetness	Eastern white pine--	53	100	Eastern white pine, red pine, tamarack, white spruce.
					Jack pine-----	52	72	
					Paper birch-----	54	55	
					Quaking aspen-----	56	57	
					Red maple-----	56	36	
					Red pine-----	56	88	
174B: Croswell-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	Bigtooth aspen-----	69	80	Eastern white pine, red pine, white spruce.
					Eastern white pine--	---	---	
					Jack pine-----	53	73	
					Northern red oak---	---	---	
					Paper birch-----	54	55	
					Quaking aspen-----	68	75	
					Red maple-----	---	---	
					Red pine-----	55	88	
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce-----	---	---	---
					Jack pine-----	---	---	
					Northern whitecedar	---	---	
					Paper birch-----	---	---	
					Quaking aspen-----	40	22	
					Tamarack-----	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
175D: Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
175E: Wallace-----	Moderate: Slope	Poorly suited: Slope Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
176B: Paquin-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	American beech----- Black cherry----- Eastern hemlock---- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 64 67 58 ---	--- --- --- --- --- 40 120 37 ---	Eastern white pine, red pine, white spruce.
Spot-----	Slight	Poorly suited: Restrictive layer	Severe: Wetness	High: Wetness	Black spruce----- Jack pine----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 40 ---	--- --- --- --- 22 ---	---
179B: Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock---- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
179D: Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
179E: Wallace-----	Moderate: Slope	Poorly suited: Slope Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
179F: Wallace-----	Severe: Slope	Unsuited: Slope Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
180B: Millecoquins--	Slight	Well suited	Moderate: Wetness	Moderate: Wetness	American basswood-- American beech----- Quaking aspen----- Sugar maple----- White ash----- Yellow birch-----	--- --- --- 65 --- ---	--- --- --- 40 --- ---	Norway spruce, red pine, white spruce.
186D: Sporley-----	Moderate:	Well suited	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 61 ---	--- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
186E: Sporley-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 61 ---	--- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
186F: Sporley-----	Very severe Slope	Unsuited: Slope	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 61 ---	--- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
187B: Auger-----	Slight	Well suited	Slight	Low	American beech----- Balsam fir----- Bigtooth aspen----- Hemlock----- Quaking aspen----- Red maple----- Sugar maple----- White spruce-----	--- --- --- --- --- --- 61 ---	--- --- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
188: Hendrie-----	Slight	Well suited	Severe: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- White spruce----- Yellow birch-----	--- --- --- --- 55 --- --- ---	--- --- --- --- 53 --- --- ---	Eastern white pine, white spruce.
189A: Bodi-----	Slight	Well suited	Severe: Rooting depth Wetness	High: Wetness	Sugar maple----- Yellow birch----- Eastern hemlock----- Red maple----- Bigtooth aspen----- Balsam fir----- Paper birch----- White spruce----- American beech-----	63 --- --- --- 80 --- --- --- ---	39 --- --- --- 94 --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
Chesbrough----	Slight	Well suited	Severe: Rooting depth Wetness	High: Wetness	Red maple----- Yellow birch----- Eastern hemlock----- Balsam fir----- Quaking aspen----- Paper birch----- Sugar maple-----	60 --- --- --- --- --- ---	39 --- --- --- --- --- ---	Eastern white pine, white spruce.
190B: Bodi-----	Slight	Well suited	Severe: Rooting depth Wetness	High: Wetness	Sugar maple----- Yellow birch----- Eastern hemlock----- Red maple----- Bigtooth aspen----- Balsam fir----- Paper birch----- White spruce----- American beech-----	63 --- --- --- 80 --- --- --- ---	39 --- --- --- 94 --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
191D: Widgeon-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Bigtooth aspen----- Eastern hophornbeam Red maple----- Sugar maple----- Yellow birch-----	--- --- --- 65 ---	--- --- --- 40 ---	Red pine, white spruce.
Kalkaska-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- --- --- --- 73 60	--- --- --- --- --- --- 136 38	Eastern white pine, red pine.
193A: Annanias-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- White spruce----- Yellow birch-----	--- --- --- --- --- 60 --- ---	--- --- --- --- --- 38 --- ---	Eastern white pine, white spruce.
194A: Hendrie-----	Slight	Well suited	Severe: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- White spruce----- Yellow birch-----	--- --- --- --- 55 --- --- ---	--- --- --- --- 53 --- --- ---	Eastern white pine, white spruce.
Annanias-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- White spruce----- Yellow birch-----	--- --- --- --- --- 60 --- ---	--- --- --- --- --- 38 --- ---	Eastern white pine, white spruce.
195A: Chesbrough----	Slight	Well suited	Severe: Rooting depth Wetness	High: Wetness	Red maple----- Yellow birch----- Eastern hemlock----- Balsam fir----- Quaking aspen----- Paper birch----- Sugar maple-----	60 --- --- --- --- --- ---	38 --- --- --- --- --- ---	Eastern white pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
197D: Zandi-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 60 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
197E: Zandi-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American beech----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 60 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
198B: Vilas-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red pine-----	--- --- 58 --- --- 59	--- --- 82 --- --- 96	Eastern white pine, jack pine, red pine.
198D: Vilas-----	Slight	Well suited	Slight	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red pine-----	--- --- 58 --- --- 59	--- --- 82 --- --- 96	Eastern white pine, jack pine, red pine.
199B: Auger-----	Slight	Well suited	Slight	Low	American beech----- Balsam fir----- Bigtooth aspen----- Hemlock----- Quaking aspen----- Red maple----- Sugar maple----- White spruce-----	--- --- --- --- --- --- 61 ---	--- --- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
Annaias-----	Slight	Well suited	Moderate: Wetness	High: Wetness	Balsam fir----- Eastern hemlock----- Northern whitecedar Paper birch----- Quaking aspen----- Red maple----- White spruce----- Yellow birch-----	--- --- --- --- --- 60 --- ---	--- --- --- --- --- 38 --- ---	Eastern white pine, white spruce.
200B: Pence-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Paper birch----- Quaking aspen----- Red pine----- Sugar maple-----	--- --- --- --- 66 62	--- --- --- --- 117 39	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
200D: Pence-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Paper birch----- Quaking aspen----- Red pine----- Sugar maple-----	--- --- --- --- 66 62	--- --- --- --- 117 39	Eastern white pine, red pine.
200E: Pence-----	Moderate: Slope	Poorly suited: Slope	Slight	Low	American beech----- Eastern white pine-- Paper birch----- Quaking aspen----- Red pine----- Sugar maple-----	--- --- --- --- 66 62	--- --- --- --- 117 39	Eastern white pine, red pine.
201B: Croswell, rarely flooded-----	Slight	Well suited	Moderate: Wetness	Moderate: Droughty	Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- --- 53 --- --- 68 --- 55	--- --- 73 --- --- 78 --- 88	Eastern white pine, red pine, white spruce.
Deford, frequently flooded-----	Slight	Poorly suited: Wetness	Moderate: Wetness	High: Wetness	Balsam fir----- Northern whitecedar Quaking aspen----- Red maple----- Speckled alder----- Tamarack-----	--- --- --- --- --- ---	--- --- --- --- --- ---	---
202B: Whitewash-----	Slight	Well suited	Slight	Moderate: Droughty	Eastern hophornbeam Red maple----- Sugar maple----- Yellow birch-----	--- --- 64 ---	--- --- 40 ---	Eastern white pine, red pine.
203D: Frohling-----	Slight	Well suited	Severe: Rooting depth	Low	Eastern hemlock----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 63 ---	--- --- --- --- 39 ---	Eastern white pine, red pine.
203E: Frohling-----	Moderate: Slope	Poorly suited: Slope	Severe: Rooting depth	Low	Eastern hemlock----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 63 ---	--- --- --- --- 39 ---	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
204: Gogomain-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Balsam fir----- Balsam poplar----- Northern whitecedar Paper birch----- Quaking aspen----- Tamarack-----	--- --- --- --- 55 ---	--- --- --- --- 53 ---	---
205B: Kalkaska, burned-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- 59 --- --- --- 56 ---	--- --- --- 84 --- --- --- 90 ---	Eastern white pine, jack pine, red pine.
205D: Kalkaska, burned-----	Slight	Well suited	Slight	Moderate: Droughty	American beech----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- --- 59 --- --- --- 56 ---	--- --- --- 84 --- --- --- 90 ---	Eastern white pine, jack pine, red pine.
206B: Deerton-----	Slight	Well suited	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern hemlock----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- --- --- 60 ---	--- --- --- --- --- --- 38 ---	Eastern white pine, red pine.
211D: Frohling-----	Slight	Well suited	Severe: Rooting depth	Low	Eastern hemlock----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 63 ---	--- --- --- --- 39 ---	Eastern white pine, red pine.
Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
211E: Frohling-----	Moderate: Slope	Poorly suited: Slope	Severe: Rooting depth	Low	Balsam fir----- Eastern hemlock----- Paper birch----- Quaking aspen----- Red maple----- Sugar maple----- White spruce----- Yellow birch-----	--- --- --- --- 63 --- ---	--- --- --- --- 39 ---	Norway spruce, eastern white pine, red pine, white spruce.
Wallace-----	Moderate: Slope	Poorly suited: Slope Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
212: Markey-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Northern whitecedar Tamarack-----	--- --- ---	--- ---	---
214D: Rousseau-----	Slight	Well suited	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Markey-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Northern whitecedar Tamarack-----	--- --- ---	--- ---	---
214E: Rousseau-----	Moderate: Slope	Poorly suited: Slope	Slight	Moderate: Droughty	Balsam fir----- Bigtooth aspen----- Eastern white pine-- Jack pine----- Northern red oak---- Paper birch----- Quaking aspen----- Red maple----- Red pine-----	--- 53 --- 47 --- --- --- --- 49	--- 49 --- 60 --- --- --- --- 73	Jack pine, red pine.
Markey-----	Slight	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Northern whitecedar Tamarack-----	--- --- ---	--- ---	---

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
215B: Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 --- 87 --- 99 ---	Eastern white pine, red pine, white spruce.
Alcona-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
215D: Wallace-----	Slight	Poorly suited: Restrictive layer	Slight	Moderate: Droughty	Balsam fir----- Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple-----	--- --- 52 --- 75 --- 59 ---	--- --- 96 72 87 --- 99 ---	Eastern white pine, red pine, white spruce.
Alcona-----	Slight	Well suited	Slight	Low	American beech----- Eastern white pine-- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
246B: Garlic-----	Slight	Well suited	Slight	Moderate: Droughty	Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- --- 62 ---	--- --- --- --- --- --- 39 ---	Eastern white pine, red pine.
246D: Garlic-----	Slight	Well suited	Slight	Moderate: Droughty	Eastern hemlock----- Eastern white pine-- Paper birch----- Quaking aspen----- Red maple----- Red pine----- Sugar maple----- Yellow birch-----	--- --- --- --- --- --- 62 ---	--- --- --- --- --- --- 38 ---	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Management concerns				Potential productivity			Suggested trees to plant
	Erosion hazard	Suitability for site preparation	Windthrow hazard	Potential for seedling mortality	Common trees	Site index	Volume of wood fiber*	
286B: Fence-----	Slight	Well suited	Moderate: Wetness	Moderate: Wetness	American beech----- Eastern hemlock----- Eastern white pine-- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- --- 61 ---	--- --- --- --- --- 38 ---	Eastern white pine, red pine, white spruce.
287B: Noseum-----	Slight	Well suited	Moderate: Wetness	Low	Balsam fir----- Bigtooth aspen----- Black cherry----- Eastern hemlock----- Quaking aspen----- Red maple----- Sugar maple----- Yellow birch-----	--- --- --- --- 70 --- 59 ---	--- --- --- --- 81 --- 38 ---	Eastern white pine, red pine, white spruce.

*Volume is the yield in cubic feet per acre at the age of culmination of the mean annual increment for fully stocked stands.

Table 8.--Equipment Limitations on Woodland

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for further explanation of ratings in this table)

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
10D: Ontonagon-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
15B: Liminga-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
15D: Liminga-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
15E: Liminga-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
15F: Liminga-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
16B: Graveraet-----	Poorly suited: Wetness Low strength	Poorly suited: Wetness Low strength	Moderately suited: Wetness Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
17C: Deer Park-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
17E: Deer Park-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Well suited
17F: Deer Park-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
18B: Rubicon-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
18D: Rubicon-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
18E: Rubicon-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
18F: Rubicon-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
19B: Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
19D: Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
19E: Kalkaska-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
19F: Kalkaska-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
20B: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
21A: Finch-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
22: Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
23: Leafriver-----	Poorly suited: Wetness	Poorly suited: Wetness Ponding	Poorly suited: Wetness	Summer, winter.	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
24B: Springlake-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
29A: Solona-----	Poorly suited: Wetness Low strength	Poorly suited: Wetness Low strength	Poorly suited: Wetness Low strength	Summer, winter.	Well suited	Well suited	Well suited
30: Kinross-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
31B: McMillan-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
31D: McMillan-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
31E: McMillan-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
31F: McMillan-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Summer, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
32A: Allendale-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
33. Pits							

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
35: Histosols. Aquents.							
36: Carbondale-----	Poorly suited: Wetness Low strength	Poorly suited: Wetness Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Lupton-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Tawas-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Wetness Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
37: Dawson-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Greenwood-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Loxley-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
45D: Rubicon-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
45E: Rubicon-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
46B: Kalkaska-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
46D: Kalkaska-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
46E: Kalkaska-----	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
46F: Kalkaska-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
47B: Trenary-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
47D: Trenary-----	Moderately suited: Low strength	Moderately suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
53B: Menominee, sandy substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
57B: Amadon-----	Poorly suited: Restrictive layer	Poorly suited: Restrictive layer	Moderately suited: Low strength	Summer, fall, winter.	Poorly suited: Restrictive layer	Poorly suited: Restrictive layer	Well suited
Longrie-----	Moderately suited: Low strength Restrictive layer	Moderately suited: Low strength Restrictive layer	Moderately suited: Low strength	Summer, fall, winter.	Moderately suited: Restrictive layer	Moderately suited: Restrictive layer	Well suited
Rock outcrop.							
57D: Amadon-----	Poorly suited: Restrictive layer	Moderately suited: Slope Low strength	Moderately suited: Low strength	Summer, fall, winter.	Poorly suited: Restrictive layer	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
57D: Longrie-----	Moderately suited: Low strength Restrictive layer	Moderately suited: Slope Low strength	Moderately suited: Low strength	Summer, fall, winter.	Moderately suited: Restrictive layer	Moderately suited: Slope	Well suited
Rock outcrop.							
57E: Amadon-----	Poorly suited: Restrictive layer Slope	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Poorly suited: Restrictive layer Slope	Poorly suited: Slope	Moderately suited: Slope
Longrie-----	Moderately suited: Slope Low strength Restrictive layer	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Restrictive layer Slope	Poorly suited: Slope	Moderately suited: Slope
Rock outcrop.							
60A: Kinross-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
61B: Paquin-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
65B: Rubicon, organic surface-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
65D: Rubicon, organic surface-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
65E: Rubicon, organic surface-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
66B:							
Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Kaks-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
66D:							
Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Kaks-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
66E:							
Kalkaska-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Kaks-----	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
66F:							
Kalkaska-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Kaks-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
74B:							
Menominee, sandy substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Graveraet-----	Poorly suited: Wetness	Poorly suited: Wetness	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
75D:							
Dillingham-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
75E:							
Dillingham-----	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Kalkaska-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
75F:							
Dillingham-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Kalkaska-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
76D:							
Menominee, sandy substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Trenary-----	Moderately suited: Low strength	Moderately suited: Slope Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
76E:							
Menominee, sandy substratum-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Trenary-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
84B:							
Liminga-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Alcona-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
84D:							
Liminga-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
84D: Alcona-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
84E: Liminga-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Alcona-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Low strength Slope	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
85B: Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Okeefe-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
85D: Kalkaska-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Okeefe-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
85E: Kalkaska-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Okeefe-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
88B: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
89A:							
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Finch-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
90D:							
Rousseau-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
90E:							
Rousseau-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Well suited
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
90F:							
Rousseau-----	Poorly suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
91D:							
Rousseau-----	Moderately suited: Sandiness	Moderately suited: Slope	Moderately suited: Sandiness	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
91E:							
Rousseau-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope Sandiness	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
91F:							
Rousseau-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Summer, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
93F: Ontonagon-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Summer, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Pickford, occasionally flooded-----	Moderately suited: Flooding Low strength	Poorly suited: Wetness Flooding Low strength	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
94A: Tawas-----	Poorly suited: Low strength	Poorly suited: Wetness Low strength	Poorly suited: Low strength	Winter	Moderately suited: Low strength	Poorly suited: Low strength	Moderately suited: Low strength
Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Finch-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
102: Spot-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding	Poorly suited: Wetness	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
104B: Pence-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
104D: Pence-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
104E: Pence-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Low strength Slope	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
109D: Rousseau-----	Moderately suited: Sandiness	Moderately suited: Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
109D: Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding	Poorly suited: Wetness	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
109F: Rousseau-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding	Poorly suited: Wetness	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
110D: Au Gres-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding	Poorly suited: Wetness	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Rubicon-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
110E: Au Gres-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding	Poorly suited: Wetness	Winter	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
Rubicon-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Sandiness Slope	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
117D: Manistee, sandy substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
120B: McMillan-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
Trenary-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
120D: McMillan-----	Moderately suited: Low strength	Moderately suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Trenary-----	Moderately suited: Low strength	Moderately suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
120E: McMillan-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Trenary-----	Moderately suited: Slope	Poorly suited: Slope Low strength	Moderately suited: Low strength Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
122. Pits, quarry							
126: Pickford-----	Moderately suited: Low strength	Poorly suited: Wetness Ponding Low strength	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
129A: Rudyard-----	Well suited	Poorly suited: Wetness Low strength	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
130A: Rudyard-----	Well suited	Poorly suited: Wetness Low strength	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
Pickford-----	Moderately suited: Low strength	Poorly suited: Wetness Ponding Low strength	Moderately suited: Low strength	Summer, winter.	Well suited	Well suited	Well suited
132B: Sugar-----	Moderately suited: Low strength	Poorly suited: Wetness Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
133: Dorval-----	Poorly suited: Wetness	Moderately suited: Ponding Stickiness	Poorly suited: Wetness Stickiness	Winter	Moderately suited: Stickiness	Moderately suited: Stickiness	Moderately suited: Stickiness
143: Caffey-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
146A: Allendale-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, fall, winter.	Well suited	Well suited	Well suited
Fibre-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
167D: Battydoe-----	Moderately suited: Low strength	Moderately suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Wallace-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
173B: Paquin-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Finch-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
174B: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Spot-----	Poorly suited: Wetness	Moderately suited: Ponding	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
175D: Wallace-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Spot-----	Poorly suited: Wetness	Moderately suited: Ponding	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
175E: Wallace-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope Sandiness	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Spot-----	Poorly suited: Wetness	Moderately suited: Ponding	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
176B: Paquin-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Spot-----	Poorly suited: Wetness	Poorly suited: Wetness Ponding	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
179B: Wallace-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
179D: Wallace-----	Moderately suited: Sandiness	Moderately suited: Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
179E: Wallace-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope Sandiness	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
179F: Wallace-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
180B: Millecoquins----	Moderately suited: Low strength Wetness	Moderately suited: Wetness Low strength	Moderately suited: Low strength Wetness	Summer, fall, winter.	Well suited	Well suited	Well suited
186D: Sporley-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
186E: Sporley-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Low strength Slope	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
186F: Sporley-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Summer, fall, winter.	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
187B: Auger-----	Moderately suited: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
188: Hendrie-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
189A: Bodi-----	Moderately suited: Low strength Wetness	Moderately suited: Wetness Low strength	Moderately suited: Low strength Wetness	Summer, fall, winter.	Well suited	Well suited	Well suited
Chesbrough-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
190B: Bodi-----	Moderately suited: Low strength Wetness	Moderately suited: Low strength Wetness	Moderately suited: Low strength Wetness	Summer, fall, winter.	Well suited	Well suited	Well suited
191D: Widgeon-----	Moderately suited: Low strength	Moderately suited: Slope Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Kalkaska-----	Moderately suited:	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
193A: Annanias-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
194A: Hendrie-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
Annanias-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
195A: Chesbrough-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
197D: Zandi-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
197E: Zandi-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Low strength Slope	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
198B: Vilas-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
198D: Vilas-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
199B: Auger-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
Annaias-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited
200B: Pence-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
200D: Pence-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
200E: Pence-----	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
201B: Croswell, rarely flooded-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Deford, frequently flooded-----	Poorly suited: Wetness Flooding	Poorly suited: Flooding Wetness	Poorly suited: Wetness	Summer, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
202B: Whitewash-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
203D: Frohling-----	Moderately suited: Low strength	Moderately suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
203E: Frohling-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
204: Gogomain-----	Poorly suited: Wetness Low strength	Moderately suited: Ponding Low strength	Moderately suited: Low strength Wetness	Summer, winter.	Well suited	Well suited	Well suited
205B: Kalkaska, burned	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
205D: Kalkaska, burned	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
206B: Deerton-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
211D: Frohling-----	Moderately suited: Low strength	Poorly suited: Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Wallace-----	Moderately suited: Sandiness	Moderately suited: Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
211E: Frohling-----	Moderately suited: Slope Low strength	Poorly suited: Slope	Moderately suited: Slope Low strength	Summer, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Wallace-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope Sandiness	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
212: Markey-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter, summer.	Moderately suited: Wetness Low strength	Moderately suited: Wetness Low strength	Moderately suited: wetness Low strength

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
214D: Rousseau-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Markey-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Wetness Low strength	Moderately suited: Wetness Low strength	Moderately suited: Wetness Low strength
214E: Rousseau-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope Sandiness	Spring, fall, winter.	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Markey-----	Poorly suited: Wetness Low strength	Poorly suited: Ponding Low strength	Poorly suited: Wetness Low strength	Winter	Moderately suited: Wetness Low strength	Moderately suited: Wetness Low strength	Moderately suited: Wetness Low strength
215B: Wallace-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
Alcona-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
215D: Wallace-----	Moderately suited: Sandiness	Moderately suited: Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
Alcona-----	Moderately suited: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Moderately suited: Slope	Well suited
246B: Garlic-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Well suited	Well suited
246D: Garlic-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter.	Well suited	Moderately suited: Slope	Well suited
286B: Fence-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Woodland--Continued

Map symbol and soil name	Ratings for most limiting season(s)			Preferred operating season(s)	Ratings for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
287B: Noseum-----	Moderately suited: Low strength	Moderately suited: Low strength	Moderately suited: Low strength	Summer, fall, winter.	Well suited	Well suited	Well suited
300. Beaches							
W. Water							

Table 9a.--Recreational Development

(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	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Very limited Restricted permeability Slope	1.00 0.37	Very limited Restricted permeability Slope	1.00 0.37	Very limited Slope Restricted permeability	1.00 1.00
15B: Liminga-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
15D: Liminga-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Slope Too sandy	1.00 1.00
15E: Liminga-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
15F: Liminga-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
16B: Graveraet-----	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96
17C: Deer Park-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.88
17E: Deer Park-----	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
17F: Deer Park-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
18B: Rubicon-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12

Table 9a.--Recreational Development--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
18D:						
Rubicon-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
18E:						
Rubicon-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
18F:						
Rubicon-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
19B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
19D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
19E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
19F:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
20B:						
Croswell-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
21A:						
Finch-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
22:						
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 9a.--Recreational Development--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
23: Leafriver-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00 1.00	Very limited Too sandy saturated zone Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00 1.00
24B: Springlake-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
29A: Solona-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
30: Kinross-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00 1.00	Very limited Too sandy Depth to saturated zone Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00 1.00
31B: McMillan-----	Not limited		Not limited		Somewhat limited Slope	0.12
31D: McMillan-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
31E: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
31F: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
32A: Allendale-----	Very limited Depth to saturated zone Too sandy Restricted permeability	1.00 1.00 1.00 1.00	Very limited Too sandy saturated zone Restricted permeability	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Restricted permeability	1.00 1.00 1.00 1.00
33: Pits-----	Not rated		Not rated		Not rated	
35: Histosols-----	Very limited Ponding Content of organic matter	1.00 1.00	Very limited Ponding Content of organic matter	1.00 1.00	Very limited Ponding Content of organic matter	1.00 1.00
Aquents-----	Very limited Ponding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00

Table 9a.--Recreational Development--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
36:						
Carbondale-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
Lupton-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
Tawas-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Depth to saturated zone	1.00	Content of organic matter	1.00
	Too sandy	1.00	Content of organic matter	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
37:						
Dawson-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Greenwood-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
Loxley-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
45D:						
Rubicon-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 9a.--Recreational Development--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
45E:						
Rubicon-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Depth to cemented	1.00	saturated zone		Depth to cemented	1.00
	pan		Depth to cemented	1.00	pan	
	Too sandy	1.00	pan		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
46B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
46D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
46E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
46F:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
47B:						
Trenary-----	Not limited		Not limited		Somewhat limited	
					Slope	0.50
47D:						
Trenary-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
53B:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.50
57B:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
					Slope	0.50
Longrie-----	Not limited		Not limited		Somewhat limited	
					Slope	0.50
					Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	

Table 9a.--Recreational Development--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
57D:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Depth to bedrock	1.00
Longrie-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
					Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	
57E:						
Amadon-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Longrie-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	
60A:						
Kinross-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
61B:						
Paquin-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
65B:						
Rubicon, organic surface-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
65D:						
Rubicon, organic surface-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
65E:						
Rubicon, organic surface-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00

Table 9a.--Recreational Development--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
66B:						
Kalkaska-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
Kaks-----	Not limited		Not limited		Somewhat limited Slope Content of large stones	0.12 0.01
66D:						
Kalkaska-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Slope Too sandy	1.00 1.00
Kaks-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Content of large stones	1.00 0.01
66E:						
Kalkaska-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
Kaks-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope Content of large stones	1.00 0.01
66F:						
Kalkaska-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy	1.00 1.00
Kaks-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope Content of large stones	1.00 0.01
74B:						
Menominee, sandy substratum-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.50
Graveraet-----	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96	Very limited Depth to saturated zone Depth to cemented pan Restricted permeability	1.00 1.00 0.96
75D:						
Dillingham-----	Very limited Too sandy Depth to cemented pan Slope	1.00 0.99 0.37	Very limited Too sandy Depth to cemented pan Slope	1.00 0.99 0.37	Very limited Slope Too sandy Depth to cemented pan	1.00 1.00 0.99

Table 9a.--Recreational Development--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
75D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
75E:						
Dillingham-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
	Depth to cemented pan	0.99	Depth to cemented pan	0.99	Depth to cemented pan	0.99
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
75F:						
Dillingham-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
	Depth to cemented pan	0.99	Depth to cemented pan	0.99	Depth to cemented pan	0.99
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
76D:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
Trenary-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
76E:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
Trenary-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
84B:						
Liminga-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
Alcona-----	Not limited		Not limited		Somewhat limited	
					Slope	0.12
84D:						
Liminga-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
Alcona-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00

Table 9a.--Recreational Development--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
84E:						
Liminga-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
Alcona-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
85B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
Okeefe-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
85D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
Okeefe-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
85E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
Okeefe-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
88B:						
Croswell-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Depth to	0.39	Depth to	0.19	Depth to	0.39
	saturated zone		saturated zone		saturated zone	
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Too sandy	1.00	saturated zone		Too sandy	1.00
89A:						
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Depth to cemented	1.00	saturated zone		Depth to cemented	1.00
	pan		Depth to cemented	1.00	pan	
	Too sandy	1.00	pan		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 9a.--Recreational Development--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
89A:						
Finch-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
90D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
90E:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
90F:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
91D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
91E:						
Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00
91F:						
Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Slope	1.00	Too sandy	1.00

Table 9a.--Recreational Development--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
93F:						
Ontonagon-----	Very limited		Very limited		Very limited	
	Restricted	1.00	Restricted	1.00	Slope	1.00
	permeability		permeability		Restricted	1.00
	Slope	1.00	Slope	1.00	permeability	
Pickford, occasionally flooded-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Flooding	1.00	Restricted	1.00	Restricted	1.00
	Restricted	1.00	permeability		permeability	
	permeability				Flooding	0.60
94A:						
Tawas-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Content of	1.00	saturated zone		Content of	1.00
	organic matter		Content of	1.00	organic matter	
	Too sandy	1.00	organic matter		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Depth to cemented	1.00	saturated zone		Depth to cemented	1.00
	pan		Depth to cemented	1.00	pan	
	Too sandy	1.00	pan		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Finch-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Depth to cemented	1.00	saturated zone		Depth to cemented	1.00
	pan		Depth to cemented	1.00	pan	
	Too sandy	1.00	pan		Too sandy	1.00
102:						
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Depth to cemented	1.00	saturated zone		Depth to cemented	1.00
	pan		Depth to cemented	1.00	pan	
	Too sandy	1.00	pan		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Too sandy	1.00	Depth to	1.00
	saturated zone		Depth to	1.00	saturated zone	
	Too sandy	1.00	saturated zone		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
104B:						
Pence-----	Not limited		Not limited		Somewhat limited	
					Slope	0.12
104D:						
Pence-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00

Table 9a.--Recreational Development--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
104E: Pence-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
109D: Rousseau-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Too sandy saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
109F: Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Too sandy saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
110D: Au Gres-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy saturated zone	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Too sandy saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
Rubicon-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 1.00
110E: Au Gres-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Too sandy saturated zone	1.00 1.00	Very limited Depth to saturated zone Too sandy	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Too sandy saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00
Rubicon-----	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Too sandy Slope	1.00 1.00

Table 9a.--Recreational Development--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
116: Udipsamments-----	Not rated		Not rated		Not rated	
Udorthents-----	Not rated		Not rated		Not rated	
117D: Manistee, sandy substratum-----	Very limited Too sandy Restricted permeability Slope	1.00 1.00 0.37	Very limited Too sandy Restricted permeability Slope	1.00 1.00 0.37	Very limited Slope Too sandy Restricted permeability	1.00 1.00 1.00
120B: McMillan-----	Not limited		Not limited		Somewhat limited Slope	0.12
Trenary-----	Not limited		Not limited		Somewhat limited Slope	0.50
120D: McMillan-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Trenary-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
120E: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Trenary-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
122: Pits, quarry-----	Not rated		Not rated		Not rated	
126: Pickford-----	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00
129A: Rudyard-----	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00
130A: Rudyard-----	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00

Table 9a.--Recreational Development--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
130A:						
Pickford-----	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
	Ponding	1.00	Ponding	1.00	Ponding	1.00
132B:						
Sugar-----	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
					Slope	0.12
133:						
Dorval-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
143:						
Caffey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.26	Restricted permeability	0.26	Restricted permeability	0.26
146A:						
Allendale-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Fibre-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
167D:						
Battydoe-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00

Table 9a.--Recreational Development--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
173B:						
Paquin-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan		Too sandy	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
Finch-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
174B:						
Croswell-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
175D:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
175E:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 9a.--Recreational Development--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
176B:						
Paquin-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan		Too sandy	1.00
	Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
					Slope	0.12
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan		Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
179B:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	pan		Too sandy	1.00
					Slope	0.12
179D:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
179E:						
Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Depth to cemented pan	1.00	Slope	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
179F:						
Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Depth to cemented pan	1.00	Slope	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
180B:						
Millecoquins-----	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	0.26	Restricted permeability	0.26	Restricted permeability	0.26
					Slope	0.12
186D:						
Sporley-----	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.60	Restricted permeability	0.60	Slope	1.00
	Slope	0.37	Slope	0.37	Restricted permeability	0.60

Table 9a.--Recreational Development--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
186E: Sporley-----	Very limited Slope Restricted permeability	1.00 0.60	Very limited Slope Restricted permeability	1.00 0.60	Very limited Slope Restricted permeability	1.00 0.60
186F: Sporley-----	Very limited Slope Restricted permeability	1.00 0.60	Very limited Slope Restricted permeability	1.00 0.60	Very limited Slope Restricted permeability	1.00 0.60
187B: Auger-----	Not limited		Not limited		Somewhat limited Slope	0.12
188: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
189A: Bodi-----	Somewhat limited Depth to saturated zone Depth to cemented pan	0.98 0.90	Somewhat limited Depth to cemented pan Depth to saturated zone	0.90 0.75	Somewhat limited Depth to saturated zone Depth to cemented pan Slope	0.98 0.90 0.12
Chesbrough-----	Very limited Depth to saturated zone Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to cemented pan	1.00 1.00
190B: Bodi-----	Somewhat limited Depth to saturated zone Depth to cemented pan	0.98 0.90	Somewhat limited Depth to cemented pan Depth to saturated zone	0.90 0.75	Somewhat limited Depth to saturated zone Depth to cemented pan Slope	0.98 0.90 0.12
191D: Widgeon-----	Somewhat limited Depth to saturated zone Slope Restricted permeability	0.98 0.37 0.26	Somewhat limited Depth to saturated zone Slope Restricted permeability	0.75 0.37 0.26	Very limited Slope Depth to saturated zone Restricted permeability	1.00 0.98 0.26
Kalkaska-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Slope Too sandy	1.00 1.00
193A: Annanias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Table 9a.--Recreational Development--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
194A:						
Hendrie-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Annaiias-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Ponding		Ponding	1.00	Ponding	1.00
195A:						
Chesbrough-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Depth to cemented	1.00	Depth to cemented	1.00	Depth to cemented	1.00
	pan		pan		pan	
197D:						
Zandi-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
197E:						
Zandi-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
198B:						
Vilas-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
198D:						
Vilas-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
199B:						
Auger-----	Not limited		Not limited		Somewhat limited	
					Slope	0.12
Annaiias-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
200B:						
Pence-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.12
					Content of large	0.03
					stones	
200D:						
Pence-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
					Content of large	0.03
					stones	

Table 9a.--Recreational Development--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
200E: Pence-----	Very limited Slope Too sandy	1.00 1.00	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Too sandy Content of large stones	1.00 1.00 0.03
201B: Croswell, rarely flooded-----	Very limited Flooding Too sandy Depth to saturated zone	1.00 1.00 0.39	Very limited Too sandy Depth to saturated zone	1.00 0.19	Very limited Too sandy Depth to saturated zone Slope	1.00 0.39 0.12
Deford, frequently flooded-----	Very limited Depth to saturated zone Flooding Too sandy	1.00 1.00 1.00	Very limited Too sandy Depth to saturated zone Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Too sandy Flooding	1.00 1.00 1.00
202B: Whitewash-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy	1.00
203D: Frohling-----	Very limited Depth to cemented pan Slope	1.00 0.37	Very limited Depth to cemented pan Slope	1.00 0.37	Very limited Slope Depth to cemented pan	1.00 1.00
203E: Frohling-----	Very limited Slope Depth to cemented pan	1.00 1.00	Very limited Slope Depth to cemented pan	1.00 1.00	Very limited Slope Depth to cemented pan	1.00 1.00
204: Gogomain-----	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00
205B: Kalkaska, burned----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
205D: Kalkaska, burned----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Slope Too sandy	1.00 1.00
206B: Deerton-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Depth to bedrock Slope	1.00 0.20 0.12

Table 9a.--Recreational Development--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
211D:						
Frohling-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00	Slope	1.00
	Slope	0.37	Slope	0.37	Depth to cemented pan	1.00
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Slope	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	0.37	Too sandy	1.00
211E:						
Frohling-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Slope	1.00
	Depth to cemented pan	1.00	Slope	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
212:						
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
214D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
214E:						
Rousseau-----	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
215B:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to cemented pan	1.00	Too sandy	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to cemented pan	1.00	Too sandy	1.00
					Slope	0.12

Table 9a.--Recreational Development--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
215B: Alcona-----	Not limited		Not limited		Somewhat limited Slope	0.12
215D: Wallace-----	Very limited Depth to cemented pan Too sandy Slope	1.00 1.00 0.37	Very limited Too sandy Depth to cemented pan Slope	1.00 1.00 0.37	Very limited Slope Depth to cemented pan Too sandy	1.00 1.00 1.00
Alcona-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
246B: Garlic-----	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12
246D: Garlic-----	Very limited Too sandy Slope	1.00 0.37	Very limited Too sandy Slope	1.00 0.37	Very limited Slope Too sandy	1.00 1.00
286B: Fence-----	Somewhat limited Depth to saturated zone Restricted permeability	0.98 0.60	Somewhat limited Depth to saturated zone Restricted permeability	0.75 0.60	Somewhat limited Depth to saturated zone Restricted permeability Slope	0.98 0.60 0.12
287B: Noseum-----	Somewhat limited Depth to saturated zone	0.39	Somewhat limited Depth to saturated zone	0.19	Somewhat limited Depth to saturated zone	0.39
300: Beaches-----	Not rated		Not rated		Not rated	
W: Water-----	Not rated		Not rated		Not rated	

Table 9b.--Recreational Development

(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	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Very limited Water erosion	1.00	Somewhat limited Slope	0.37
15B: Liminga-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.75
15D: Liminga-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.75 0.37
15E: Liminga-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.75
15F: Liminga-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty	1.00 0.75
16B: Graveraet-----	Very limited Depth to saturated zone	1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 0.80
17C: Deer Park-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.85
17E: Deer Park-----	Very limited Too sandy Slope Ponding	1.00 0.08 1.00	Very limited Slope Droughty	1.00 0.85
17F: Deer Park-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty	1.00 0.85
18B: Rubicon-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.91

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
18D: Rubicon-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.91 0.37
18E: Rubicon-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.91
18F: Rubicon-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty	1.00 0.91
19B: Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
19D: Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
19E: Kalkaska-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
19F: Kalkaska-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
20B: Croswell-----	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to saturated zone	0.92 0.19
21A: Finch-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
22: Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00 1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
23: Leafriver-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
24B: Springlake-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.94
29A: Solona-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone	1.00
30: Kinross-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Droughty	1.00 1.00 0.04
31B: McMillan-----	Not limited		Somewhat limited Droughty	0.20
31D: McMillan-----	Not limited		Somewhat limited Slope Droughty	0.37 0.20
31E: McMillan-----	Very limited Slope	1.00	Very limited Slope Droughty	1.00 0.20
31F: McMillan-----	Very limited Slope	1.00	Very limited Slope Droughty	1.00 0.20
32A: Allendale-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.13
33: Pits-----	Not rated		Not rated	
35: Histosols-----	Very limited Content of organic matter Ponding	1.00 1.00	Very limited Content of organic matter Ponding	1.00 1.00
Aquents-----	Very limited Ponding	1.00	Very limited Ponding	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
36:				
Carbondale-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00
Lupton-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00
Tawas-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Content of organic matter	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Ponding	1.00
	Ponding	1.00		
37:				
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Ponding	1.00
	Ponding	1.00		
Greenwood-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00
Loxley-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00
45D:				
Rubicon-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.91
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Droughty	1.00
			Ponding	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
45E:				
Rubicon-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.91
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to cemented	1.00
	saturated zone		pan	
	Too sandy	1.00	Depth to	1.00
	Ponding	1.00	saturated zone	
			Droughty	1.00
			Ponding	1.00
46B:				
Kalkaska-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.72
46D:				
Kalkaska-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.72
			Slope	0.37
46E:				
Kalkaska-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.72
46F:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Too sandy	1.00	Droughty	0.72
47B:				
Trenary-----	Not limited		Not limited	
47D:				
Trenary-----	Not limited		Somewhat limited	
			Slope	0.37
53B:				
Menominee, sandy substratum-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.42
57B:				
Amadon-----	Not limited		Very limited	
			Depth to bedrock	1.00
			Droughty	1.00
Longrie-----	Not limited		Somewhat limited	
			Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated	
57D:				
Amadon-----	Not limited		Very limited	
			Depth to bedrock	1.00
			Droughty	1.00
			Slope	0.37

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
57D:				
Longrie-----	Not limited		Somewhat limited	
			Slope	0.37
			Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated	
57E:				
Amadon-----	Very limited		Very limited	
	Slope	1.00	Depth to bedrock	1.00
			Slope	1.00
			Droughty	1.00
Longrie-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Depth to bedrock	0.06
Rock outcrop-----	Not rated		Not rated	
60A:				
Kinross-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Ponding	1.00
	Ponding	1.00	Droughty	0.04
Au Gres-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Droughty	0.80
61B:				
Paquin-----	Very limited		Very limited	
	Too sandy	1.00	Depth to cemented pan	1.00
			Droughty	1.00
			Depth to saturated zone	0.19
65B:				
Rubicon, organic surface-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.96
65D:				
Rubicon, organic surface-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.96
			Slope	0.37
65E:				
Rubicon, organic surface-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.96
66B:				
Kalkaska-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.87
			Too sandy	0.50

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
66B: Kaks-----	Not limited		Somewhat limited Content of large stones	0.01
66D: Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
Kaks-----	Not limited		Somewhat limited Slope Content of large stones	0.37 0.01
66E: Kalkaska-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Kaks-----	Very limited Slope	1.00	Very limited Slope Content of large stones	1.00 0.01
66F: Kalkaska-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Kaks-----	Very limited Slope	1.00	Very limited Slope Content of large stones	1.00 0.01
74B: Menominee, sandy substratum-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.42
Graveraet-----	Very limited Depth to saturated zone	1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 0.80
75D: Dillingham-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Slope	0.99 0.98 0.37
Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
75E:				
Dillingham-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Depth to cemented pan	0.99
			Droughty	0.98
Kalkaska-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.87
			Too sandy	0.50
75F:				
Dillingham-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Too sandy	1.00	Depth to cemented pan	0.99
			Droughty	0.98
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Too sandy	1.00	Droughty	0.87
			Too sandy	0.50
76D:				
Menominee, sandy substratum-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.42
			Slope	0.37
Trenary-----	Not limited		Somewhat limited	
			Slope	0.37
76E:				
Menominee, sandy substratum-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.42
Trenary-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
84B:				
Liminga-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.75
Alcona-----	Not limited		Not limited	
84D:				
Liminga-----	Very limited		Somewhat limited	
	Too sandy	1.00	Droughty	0.75
			Slope	0.37
Alcona-----	Not limited		Somewhat limited	
			Slope	0.37
84E:				
Liminga-----	Very limited		Very limited	
	Too sandy	1.00	Slope	1.00
	Slope	1.00	Droughty	0.75

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
84E: Alcona-----	Very limited Slope	1.00	Very limited Slope	1.00
85B: Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
Okeefe-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.33
85D: Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
Okeefe-----	Very limited Too sandy	1.00	Somewhat limited Slope Droughty	0.37 0.33
85E: Kalkaska-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty Too sandy	1.00 0.87 0.50
Okeefe-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.33
88B: Croswell-----	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to saturated zone	0.92 0.19
Au Gres-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.80
89A: Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
90D:				
Rousseau-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.84 0.37
Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
90E:				
Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.84
Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
90F:				
Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.84
Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
91D:				
Rousseau-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.84 0.37
91E:				
Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.84
91F:				
Rousseau-----	Very limited Slope Too sandy	1.00 1.00	Very limited Slope Droughty	1.00 0.84
93F:				
Ontonagon-----	Very limited Slope Water erosion	1.00 1.00	Very limited Slope	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
93F: Pickford, occasionally flooded-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
94A: Tawas-----	Very limited Depth to saturated zone Content of organic matter Too sandy Ponding	1.00 1.00 1.00 1.00	Very limited Content of organic matter Depth to saturated zone Ponding	1.00 1.00 1.00
Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
102: Spot-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty Ponding	1.00 1.00 1.00 1.00
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
104B: Pence-----	Not limited		Not limited	
104D: Pence-----	Not limited		Somewhat limited Slope	0.37
104E: Pence-----	Very limited Slope	1.00	Very limited Slope	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
109D:				
Rousseau-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.84 0.37
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
109F:				
Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.84
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
110D:				
Au Gres-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.80
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Rubicon-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.91 0.37
110E:				
Au Gres-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.80
Dawson-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Rubicon-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.91
116:				
Udipsamments-----	Not rated		Not rated	
Udorthents-----	Not rated		Not rated	

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
117D: Manistee, sandy substratum-----	Very limited Too sandy	1.00	Somewhat limited Slope Droughty	0.37 0.14
120B: McMillan-----	Not limited		Somewhat limited Droughty	0.20
Trenary-----	Not limited		Not limited	
120D: McMillan-----	Not limited		Somewhat limited Slope Droughty	0.37 0.20
Trenary-----	Not limited		Somewhat limited Slope	0.37
120E: McMillan-----	Very limited Slope	1.00	Very limited Slope Droughty	1.00 0.20
Trenary-----	Very limited Slope	1.00	Very limited Slope	1.00
122: Pits, quarry-----	Not rated		Not rated	
126: Pickford-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
129A: Rudyard-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
130A: Rudyard-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Pickford-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
132B: Sugar-----	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
133: Dorval-----	Very limited Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00	Very limited Content of organic matter Depth to saturated zone Ponding	1.00 1.00 1.00
143: Caffey-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
146A: Allendale-----	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Droughty	1.00 0.13
Fibre-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
167D: Battydoe-----	Not limited		Somewhat limited Slope	0.37
Wallace-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 0.37
173B: Paquin-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Depth to saturated zone	1.00 1.00 0.19
Finch-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 1.00
174B: Croswell-----	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to saturated zone	0.92 0.19

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
174B:				
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Droughty	1.00
			Ponding	1.00
175D:				
Wallace-----	Very limited		Very limited	
	Too sandy	1.00	Depth to cemented pan	1.00
			Droughty	1.00
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Droughty	1.00
			Ponding	1.00
175E:				
Wallace-----	Very limited		Very limited	
	Too sandy	1.00	Depth to cemented pan	1.00
	Slope	0.50	Droughty	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Droughty	1.00
			Ponding	1.00
176B:				
Paquin-----	Very limited		Very limited	
	Too sandy	1.00	Depth to cemented pan	1.00
			Droughty	1.00
			Depth to saturated zone	0.19
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Droughty	1.00
			Ponding	1.00
179B:				
Wallace-----	Very limited		Very limited	
	Too sandy	1.00	Depth to cemented pan	1.00
			Droughty	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
179D: Wallace-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 0.37
179E: Wallace-----	Very limited Too sandy Slope Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Slope Droughty Depth to saturated zone	1.00 1.00 1.00 1.00 1.00
179F: Wallace-----	Very limited Slope Too sandy	1.00 1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 1.00
180B: Millecoquins-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
186D: Sporley-----	Very limited Water erosion	1.00	Somewhat limited Slope	0.37
186E: Sporley-----	Very limited Water erosion Slope	1.00 1.00	Very limited Slope	1.00
186F: Sporley-----	Very limited Slope Water erosion	1.00 1.00	Very limited Slope	1.00
187B: Auger-----	Not limited		Not limited	
188: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
189A: Bodi-----	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to cemented pan Depth to saturated zone Droughty	0.90 0.75 0.03

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
189A: Chesbrough-----	Very limited Depth to saturated zone	1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 0.94
190B: Bodi-----	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to cemented pan Depth to saturated zone Droughty	0.90 0.75 0.03
191D: Widgeon-----	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone Slope	0.75 0.37
Kalkaska-----	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
193A: Annantias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Droughty	1.00 1.00
194A: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Annantias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Droughty	1.00 1.00
195A: Chesbrough-----	Very limited Depth to saturated zone	1.00	Very limited Depth to cemented pan Depth to saturated zone Droughty	1.00 1.00 0.94
197D: Zandi-----	Not limited		Somewhat limited Slope	0.37
197E: Zandi-----	Very limited Slope	1.00	Very limited Slope	1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
198B: Vilas-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.86
198D: Vilas-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.86 0.37
199B: Auger-----	Not limited		Not limited	
Annaias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Droughty	1.00 1.00
200B: Pence-----	Very limited Too sandy	1.00	Somewhat limited Droughty Content of large stones	0.19 0.03
200D: Pence-----	Very limited Too sandy	1.00	Somewhat limited Slope Droughty Content of large stones	0.37 0.19 0.03
200E: Pence-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty Content of large stones	1.00 0.19 0.03
201B: Croswell, rarely flooded-----	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to saturated zone	0.92 0.19
Deford, frequently flooded-----	Very limited Depth to saturated zone Too sandy Flooding	1.00 1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
202B: Whitewash-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.98
203D: Frohling-----	Not limited		Very limited Depth to cemented pan Droughty Slope	1.00 0.94 0.37

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
203E: Frohling-----	Very limited Slope	1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 0.94
204: Gogomain-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
205B: Kalkaska, burned---	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy	0.87 0.50
205D: Kalkaska, burned---	Very limited Too sandy	1.00	Somewhat limited Droughty Too sandy Slope	0.87 0.50 0.37
206B: Deerton-----	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to bedrock	0.95 0.20
211D: Frohling-----	Not limited		Very limited Depth to cemented pan Droughty Slope	1.00 0.94 0.37
Wallace-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 0.37
211E: Frohling-----	Very limited Slope	1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 0.94
Wallace-----	Very limited Too sandy Slope	1.00 1.00	Very limited Depth to cemented pan Slope Droughty	1.00 1.00 1.00
212: Markey-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
214D:				
Rousseau-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.84 0.37
Markey-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
214E:				
Rousseau-----	Very limited Too sandy Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.84
Markey-----	Very limited Depth to saturated zone Too sandy Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
215B:				
Wallace-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty	1.00 1.00
Alcona-----	Not limited		Not limited	
215D:				
Wallace-----	Very limited Too sandy	1.00	Very limited Depth to cemented pan Droughty Slope	1.00 1.00 0.37
Alcona-----	Not limited		Somewhat limited Slope	0.37
246B:				
Garlic-----	Very limited Too sandy	1.00	Somewhat limited Droughty	0.74
246D:				
Garlic-----	Very limited Too sandy	1.00	Somewhat limited Droughty Slope	0.74 0.37
286B:				
Fence-----	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.75
287B:				
Noseum-----	Not limited		Somewhat limited Depth to saturated zone	0.19

Table 9b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value
300: Beaches-----	Not rated		Not rated	
W: Water-----	Not rated		Not rated	

Table 10.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
10D: Ontonagon-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
15B: Liminga-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
15D: Liminga-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
15E: Liminga-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
15F: Liminga-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
16B: Graveraet-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
17C: Deer Park-----	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
17E: Deer Park-----	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
17F: Deer Park-----	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
18B: Rubicon-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
18D: Rubicon-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
18E: Rubicon-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
18F: Rubicon-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
19B: Kalkaska-----	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
35:										
Histosols-----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Aquents-----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
36:										
Carbondale-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Lupton-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Tawas-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
37:										
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Greenwood-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Loxley-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
45D:										
Rubicon-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
45E:										
Rubicon-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
46B:										
Kalkaska-----	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
46D:										
Kalkaska-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
46E:										
Kalkaska-----	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
46F:										
Kalkaska-----	Very poor.	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
47B:										
Trenary-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
47D: Trenary-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
53B: Menominee, sandy substratum-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
57B: Amadon-----	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Longrie-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Rock outcrop.										
57D: Amadon-----	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Longrie-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Rock outcrop.										
57E: Amadon-----	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Longrie-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
60A: Kinross-----	Very poor.	Poor	Poor	Fair	Fair	Good	Good	Very poor.	Fair	Good.
Au Gres-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
61B: Paquin-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
65B: Rubicon, organic surface-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
65D: Rubicon, organic surface-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
65E: Rubicon, organic surface-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
66B:										
Kalkaska-----	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kaks-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
66D:										
Kalkaska-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kaks-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
66E:										
Kalkaska-----	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Kaks-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
66F:										
Kalkaska-----	Very poor.	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Kaks-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
74B:										
Menominee, sandy substratum-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Graveraet-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
75D:										
Dillingham-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kalkaska-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
75E:										
Dillingham-----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kalkaska-----	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
75F:										
Dillingham-----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kalkaska-----	Very poor.	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
76D: Menominee, sandy substratum-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Trenary-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
76E: Menominee, sandy substratum-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Trenary-----	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
84B: Liminga-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Alcona-----	Good	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
84D: Liminga-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Alcona-----	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
84E: Liminga-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Alcona-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
85B: Kalkaska-----	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Okeefe-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
85D: Kalkaska-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Okeefe-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
85E: Kalkaska-----	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Okeefe-----	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
88B: Croswell-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Au Gres-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
89A: Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Finch-----	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
90D: Rousseau-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
90E: Rousseau-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
90F: Rousseau-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
91D: Rousseau-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
91E: Rousseau-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
91F: Rousseau-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
93F: Ontonagon-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Pickford, occasionally flooded-----	Very poor.	Very poor.	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
94A: Tawas-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Finch-----	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
102: Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
104B: Pence-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
104D: Pence-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
104E: Pence-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
109D: Rousseau-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
109F: Rousseau-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
110D: Au Gres-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Rubicon.										
110E: Au Gres-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
Dawson-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Rubicon.										
116: Udipsamments.										
Udorthents.										
117D: Manistee, sandy substratum-----	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
120B: McMillan-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Trenary-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
120D: McMillan-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Trenary-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
120E: McMillan-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Trenary-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
122. Pits, quarry										
126: Pickford-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
129A: Rudyard-----	Fair	Good	Good	Good	Good	Good	Fair	Good	Good	Fair.
130A: Rudyard-----	Fair	Good	Good	Good	Good	Good	Fair	Good	Good	Fair.
Pickford-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
132B: Sugar-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
133: Dorval-----	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
143: Caffey-----	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
146A: Allendale-----	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
Fibre-----	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair.
167D: Battydoe-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Wallace-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
173B: Paquin-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Finch-----	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
174B: Croswell-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
175D: Wallace-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
175E: Wallace-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
176B: Paquin-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Spot-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
179B: Wallace-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
179D: Wallace-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
179E: Wallace-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
179F: Wallace-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
180B: Millecoquins-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
186D: Sporley-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
186E: Sporley-----	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
186F: Sporley-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
187B: Auger-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
188: Hendrie-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
189A: Bodi-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Chesbrough-----	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
190B: Bodi-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
191D: Widgeon-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Kalkaska-----	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
193A: Annaias-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
194A: Hendrie-----	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Annaias-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
195A: Chesbrough-----	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
197D: Zandi-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
197E: Zandi-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
198B: Vilas-----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
198D: Vilas-----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
199B: Auger-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Annaias-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
200B: Pence-----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
200D: Pence-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
200E: Pence-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
201B: Crowell, rarely flooded-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
Deford, frequently flooded-----	Very poor.	Very poor.	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
202B: Whitewash-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
203D: Frohling-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Fair	Poor.
203E: Frohling-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
204: Gogomain-----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
205B: Kalkaska, burned--	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
205D: Kalkaska, burned--	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
206B: Deerton-----	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
211D: Frohling-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Fair	Poor.
Wallace-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
211E: Frohling-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Fair	Poor.
Wallace-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
212: Markey-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Very poor.	Good.
214D: Rousseau-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Markey-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Very poor.	Very poor.	Good.

Table 11a.--Building Site Development

(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	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
10D: Ontonagon-----	Very limited Shrink-swell Slope	1.00 0.37	Very limited Shrink-swell Slope	1.00 0.37	Very limited Shrink-swell Slope	1.00 1.00
15B: Liminga-----	Not limited		Not limited		Not limited	
15D: Liminga-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
15E: Liminga-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
15F: Liminga-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
16B: Graveraet-----	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00
17C: Deer Park-----	Not limited		Not limited		Somewhat limited Slope	0.12
17E: Deer Park-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
17F: Deer Park-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
18B: Rubicon-----	Not limited		Not limited		Not limited	
18D: Rubicon-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
18E: Rubicon-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
18F: Rubicon-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Table 11a.--Building Site Development--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
19B: Kalkaska-----	Not limited		Not limited		Not limited	
19D: Kalkaska-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
19E: Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
19F: Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
20B: Crowell-----	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
21A: Finch-----	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00
22: Spot-----	Very limited Depth to saturated zone Depth to thin cemented pan Ponding Content of organic matter	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan Ponding Content of organic matter	1.00 1.00 1.00 1.00
23: Leafriver-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
24B: Springlake-----	Not limited		Not limited		Not limited	
29A: Solona-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
30: Kinross-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
31B: McMillan-----	Not limited		Not limited		Not limited	

Table 11a.--Building Site Development--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
31D: McMillan-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
31E: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
31F: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
32A: Allendale-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00	Very limited Depth to saturated zone	1.00
33: Pits-----	Not rated		Not rated		Not rated	
35: Histosols-----	Very limited Ponding Subsidence Depth to saturated zone Content of organic matter	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Content of organic matter	1.00 1.00 1.00 1.00	Very limited Ponding Subsidence Depth to saturated zone Content of organic matter	1.00 1.00 1.00 1.00
Aquents-----	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
36: Carbondale-----	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00
Lupton-----	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00
Tawas-----	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Subsidence Depth to saturated zone Content of organic matter Ponding	1.00 1.00 1.00 1.00

Table 11a.--Building Site Development--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
37:						
Dawson-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
Greenwood-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
Loxley-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	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	Ponding	1.00
45D:						
Rubicon-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Spot-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
45E:						
Rubicon-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Spot-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
46B:						
Kaskaska-----	Not limited		Not limited		Not limited	
46D:						
Kaskaska-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
46E:						
Kaskaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Table 11a.--Building Site Development--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
46F: Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
47B: Trenary-----	Not limited		Not limited		Not limited	
47D: Trenary-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
53B: Menominee, sandy substratum-----	Not limited		Not limited		Not limited	
57B: Amadon-----	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
Longrie-----	Somewhat limited Depth to hard bedrock	0.06	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	
57D: Amadon-----	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Longrie-----	Somewhat limited Slope	0.37	Very limited Depth to hard bedrock	1.00	Very limited Slope	1.00
	Depth to hard bedrock	0.06	Slope	0.37	Depth to hard bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	
57E: Amadon-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Longrie-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Depth to hard bedrock	0.06	Depth to hard bedrock	1.00	Depth to hard bedrock	0.06
Rock outcrop-----	Not rated		Not rated		Not rated	
60A: Kinross-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
Au Gres-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

Table 11a.--Building Site Development--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
61B:						
Paquin-----	Somewhat limited		Very limited		Somewhat limited	
	Depth to thin cemented pan	1.00	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	0.39	Depth to thin cemented pan	1.00	Depth to saturated zone	0.39
65B:						
Rubicon, organic surface-----	Not limited		Not limited		Not limited	
65D:						
Rubicon, organic surface-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
65E:						
Rubicon, organic surface-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
66B:						
Kalkaska-----	Not limited		Not limited		Not limited	
Kaks-----	Not limited		Not limited		Not limited	
66D:						
Kalkaska-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
Kaks-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
66E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kaks-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
66F:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kaks-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
74B:						
Menominee, sandy substratum-----	Not limited		Not limited		Not limited	
Graveraet-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00

Table 11a.--Building Site Development--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
75D:						
Dillingham-----	Somewhat limited Slope	0.37	Very limited Depth to thin cemented pan Slope	0.99 0.37	Very limited Slope	1.00
Kalkaska-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
75E:						
Dillingham-----	Very limited Slope	1.00	Very limited Slope Depth to thin cemented pan	1.00 0.99	Very limited Slope	1.00
Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
75F:						
Dillingham-----	Very limited Slope	1.00	Very limited Slope Depth to thin cemented pan	1.00 0.99	Very limited Slope	1.00
Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
76D:						
Menominee, sandy substratum-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Trenary-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
76E:						
Menominee, sandy substratum-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Trenary-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
84B:						
Liminga-----	Not limited		Not limited		Not limited	
Alcona-----	Not limited		Not limited		Not limited	
84D:						
Liminga-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Alcona-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
84E:						
Liminga-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Alcona-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Table 11a.--Building Site Development--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
85B:						
Kalkaska-----	Not limited		Not limited		Not limited	
Okeefe-----	Not limited		Not limited		Not limited	
85D:						
Kalkaska-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Okeefe-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
85E:						
Kalkaska-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Okeefe-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
88B:						
Croswell-----	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Au Gres-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
89A:						
Spot-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
Finch-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
90D:						
Rousseau-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Spot-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
90E:						
Rousseau-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Table 11a.--Building Site Development--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
90E: Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
90F: Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
91D: Rousseau-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
91E: Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
91F: Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
93F: Ontonagon-----	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Pickford, occasionally flooded-----	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	1.00	Shrink-swell	1.00	Shrink-swell	1.00
94A: Tawas-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00

Table 11a.--Building Site Development--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
94A:						
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
Finch-----	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 thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
102:						
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
104B:						
Pence-----	Not limited		Not limited		Not limited	
104D:						
Pence-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
104E:						
Pence-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
109D:						
Rousseau-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
109F:						
Rousseau-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00

Table 11a.--Building Site Development--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
109F:						
Dawson-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
110D:						
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
Rubicon-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00
110E:						
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Ponding	1.00	Content of organic matter	1.00
	Ponding	1.00			Ponding	1.00
Rubicon-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
116:						
Udipsammments-----	Not rated		Not rated		Not rated	
Udorthents-----	Not rated		Not rated		Not rated	
117D:						
Manistee, sandy substratum-----	Somewhat limited		Very limited		Very limited	
	Slope	0.37	Shrink-swell Slope	1.00	Slope	1.00
				0.37		
120B:						
McMillan-----	Not limited		Not limited		Not limited	
Trenary-----	Not limited		Not limited		Not limited	
120D:						
McMillan-----	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.37	Slope	0.37	Slope	1.00

Table 11a.--Building Site Development--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
120D: Trenary-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
120E: McMillan-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Trenary-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
122: Pits, quarry-----	Not rated		Not rated		Not rated	
126: Pickford-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
129A: Rudyard-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
130A: Rudyard-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Pickford-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
132B: Sugar-----	Somewhat limited Depth to saturated zone	0.98	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.98
			Shrink-swell	1.00		
133: Dorval-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
143: Caffey-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 11a.--Building Site Development--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
146A:						
Allendale-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone	1.00
Fibre-----	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
167D:						
Battydoe-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Wallace-----	Somewhat limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 1.00
173B:						
Paquin-----	Somewhat limited Depth to thin cemented pan Depth to saturated zone	1.00 0.39	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Somewhat limited Depth to thin cemented pan Depth to saturated zone	1.00 0.39
Finch-----	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00
174B:						
Croswell-----	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Spot-----	Very limited Depth to saturated zone Depth to thin cemented pan Ponding Content of organic matter	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan Ponding Content of organic matter	1.00 1.00 1.00 1.00
175D:						
Wallace-----	Somewhat limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 1.00

Table 11a.--Building Site Development--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
175D:						
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
175E:						
Wallace-----	Very limited		Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
176B:						
Paquin-----	Somewhat limited		Very limited		Somewhat limited	
	Depth to thin cemented pan	1.00	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	0.39	Depth to thin cemented pan	1.00	Depth to saturated zone	0.39
Spot-----	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 thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00			Content of organic matter	1.00
179B:						
Wallace-----	Somewhat limited		Very limited		Somewhat limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
179D:						
Wallace-----	Somewhat limited		Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
179E:						
Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00

Table 11a.--Building Site Development--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
179F: Wallace-----	Very limited Slope Depth to thin cemented pan	1.00 1.00	Very limited Slope Depth to thin cemented pan	1.00 1.00	Very limited Slope Depth to thin cemented pan	1.00 1.00
180B: Millecoquins-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
186D: Sporley-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
186E: Sporley-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
186F: Sporley-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
187B: Auger-----	Not limited		Very limited Depth to saturated zone	1.00	Not limited	
188: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
189A: Bodi-----	Somewhat limited Depth to saturated zone Depth to thick cemented pan	0.98 0.90	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Somewhat limited Depth to saturated zone Depth to thick cemented pan	0.98 0.90
Chesbrough-----	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00
190B: Bodi-----	Somewhat limited Depth to saturated zone Depth to thick cemented pan	0.98 0.90	Very limited Depth to saturated zone Depth to thick cemented pan	1.00 1.00	Somewhat limited Depth to saturated zone Depth to thick cemented pan	0.98 0.90
191D: Widgeon-----	Somewhat limited Depth to saturated zone Slope	0.98 0.37	Very limited Depth to saturated zone Slope	1.00 0.37	Very limited Slope Depth to saturated zone	1.00 0.98

Table 11a.--Building Site Development--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
191D: Kalkaska-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
193A: Annaiias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
194A: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Annaiias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
195A: Chesbrough-----	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 1.00
197D: Zandi-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
197E: Zandi-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
198B: Vilas-----	Not limited		Not limited		Not limited	
198D: Vilas-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
199B: Auger-----	Not limited		Very limited Depth to saturated zone	1.00	Not limited	
Annaiias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
200B: Pence-----	Not limited		Not limited		Not limited	
200D: Pence-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
200E: Pence-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Table 11a.--Building Site Development--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
201B: Croswell, rarely flooded-----	Very limited Flooding Depth to saturated zone	1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.39
Deford, frequently flooded-----	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
202B: Whitewash-----	Not limited		Not limited		Not limited	
203D: Frohling-----	Very limited Depth to thick cemented pan Slope	1.00 0.37	Very limited Depth to thick cemented pan Slope	1.00 0.37	Very limited Slope Depth to thick cemented pan	1.00 1.00
203E: Frohling-----	Very limited Slope Depth to thick cemented pan	1.00 1.00	Very limited Slope Depth to thick cemented pan	1.00 1.00	Very limited Slope Depth to thick cemented pan	1.00 1.00
204: Gogomain-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
205B: Kalkaska, burned----	Not limited		Not limited		Not limited	
205D: Kalkaska, burned----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
206B: Deerton-----	Not limited		Somewhat limited Depth to soft bedrock Depth to hard bedrock	0.20 0.08	Not limited	
211D: Frohling-----	Very limited Depth to thick cemented pan Slope	1.00 0.37	Very limited Depth to thick cemented pan Slope	1.00 0.37	Very limited Slope Depth to thick cemented pan	1.00 1.00
Wallace-----	Somewhat limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Slope	1.00 1.00

Table 11a.--Building Site Development--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
211E:						
Frohling-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
Wallace-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
212:						
Markey-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
214D:						
Rousseau-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Markey-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
214E:						
Rousseau-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Markey-----	Very limited Subsidence	1.00	Very limited Subsidence	1.00	Very limited Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
215B:						
Wallace-----	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00	Somewhat limited Depth to thin cemented pan	1.00
Alcona-----	Not limited		Not limited		Not limited	
215D:						
Wallace-----	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00
	Slope	0.37	Slope	0.37	Slope	1.00
Alcona-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
246B:						
Garlic-----	Not limited		Not limited		Not limited	
246D:						
Garlic-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00

Table 11a.--Building Site Development--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
286B: Fence-----	Somewhat limited Depth to saturated zone	0.98	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.98
287B: Noseum-----	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
300: Beaches-----	Not rated		Not rated		Not rated	
W: Water-----	Not rated		Not rated		Not rated	

Table 11b.--Building Site Development

(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	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Very limited Shrink-swell	1.00	Very limited Too clayey	1.00
	Frost action	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
15B: Liminga-----	Not limited		Very limited Cutbanks cave	1.00
15D: Liminga-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
15E: Liminga-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
15F: Liminga-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
16B: Graveraet-----	Very limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Cutbanks cave Dense layer	1.00 0.50
17C: Deer Park-----	Not limited		Very limited Cutbanks cave	1.00
17E: Deer Park-----	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00
17F: Deer Park-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
18B: Rubicon-----	Not limited		Very limited Cutbanks cave	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
18D: Rubicon-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
18E: Rubicon-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
18F: Rubicon-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
19B: Kalkaska-----	Not limited		Very limited Cutbanks cave	1.00
19D: Kalkaska-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
19E: Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
19F: Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
20B: Croswell-----	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
21A: Finch-----	Very limited Depth to thick cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to thick cemented pan Depth to saturated zone Cutbanks cave	1.00 1.00 1.00
22: Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
23: Leafriver-----	Very limited Depth to saturated zone Frost action Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00
24B: Springlake-----	Not limited		Very limited Cutbanks cave	1.00
29A: Solona-----	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
30: Kinross-----	Very limited Depth to saturated zone Ponding Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00
31B: McMillan-----	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00
31D: McMillan-----	Somewhat limited Frost action Slope	0.50 0.37	Very limited Cutbanks cave Slope	1.00 0.37
31E: McMillan-----	Very limited Slope Frost action	1.00 0.50	Very limited Slope Cutbanks cave	1.00 1.00
31F: McMillan-----	Very limited Slope Frost action	1.00 0.50	Very limited Slope Cutbanks cave	1.00 1.00
32A: Allendale-----	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Too clayey	1.00 1.00 0.50
33: Pits-----	Not rated		Not rated	

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
35:				
Histosols-----	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
	Frost action	1.00	Cutbanks cave	0.10
Aquents-----	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10
36:				
Carbondale-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Cutbanks cave	0.10
Lupton-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Cutbanks cave	0.10
Tawas-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
37:				
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Greenwood-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Cutbanks cave	0.10

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
37:				
Loxley-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Cutbanks cave	0.10
45D:				
Rubicon-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
45E:				
Rubicon-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
46B:				
Kalkaska-----	Not limited		Very limited	
			Cutbanks cave	1.00
46D:				
Kalkaska-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
46E:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
46F:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
47B:				
Trenary-----	Somewhat limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	0.10

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
47D:				
Trenary-----	Somewhat limited		Somewhat limited	
	Frost action	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
53B:				
Menominee, sandy substratum-----	Not limited		Very limited	
			Cutbanks cave	1.00
57B:				
Amadon-----	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
	Frost action	0.50	Cutbanks cave	0.10
Longrie-----	Somewhat limited		Very limited	
	Frost action	0.50	Depth to hard bedrock	1.00
	Depth to hard bedrock	0.06	Cutbanks cave	0.10
Rock outcrop-----	Not rated		Not rated	
57D:				
Amadon-----	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
	Frost action	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
Longrie-----	Somewhat limited		Very limited	
	Frost action	0.50	Depth to hard bedrock	1.00
	Slope	0.37	Slope	0.37
	Depth to hard bedrock	0.06	Cutbanks cave	0.10
Rock outcrop-----	Not rated		Not rated	
57E:				
Amadon-----	Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	0.10
Longrie-----	Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00
	Frost action	0.50	Slope	1.00
	Depth to hard bedrock	0.06	Cutbanks cave	0.10
Rock outcrop-----	Not rated		Not rated	
60A:				
Kinross-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
60A: Au Gres-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Frost action	0.50	Cutbanks cave	1.00
61B: Paquin-----	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00
	Depth to saturated zone	0.19	Depth to saturated zone	1.00
			Cutbanks cave	1.00
65B: Rubicon, organic surface-----	Not limited		Very limited Cutbanks cave	1.00
65D: Rubicon, organic surface-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
65E: Rubicon, organic surface-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
66B: Kalkaska-----	Not limited		Very limited Cutbanks cave	1.00
Kaks-----	Not limited		Very limited Cutbanks cave	1.00
66D: Kalkaska-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
Kaks-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
66E: Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
Kaks-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
66F: Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
66F: Kaks-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
74B: Menominee, sandy substratum-----	Not limited		Very limited Cutbanks cave	1.00
Graveraet-----	Very limited Depth to thin cemented pan Depth to saturated zone Frost action	1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Dense layer	1.00 1.00 1.00 0.50
75D: Dillingham-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Depth to thin cemented pan Dense layer Slope	1.00 0.99 0.50 0.37
Kalkaska-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
75E: Dillingham-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave Depth to thin cemented pan Dense layer	1.00 1.00 0.99 0.50
Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
75F: Dillingham-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave Depth to thin cemented pan Dense layer	1.00 1.00 0.99 0.50
Kalkaska-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
76D: Menominee, sandy substratum-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
76D:				
Trenary-----	Somewhat limited		Somewhat limited	
	Frost action	0.50	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
76E:				
Menominee, sandy substratum-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
Trenary-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	0.10
84B:				
Liminga-----	Not limited		Very limited	
			Cutbanks cave	1.00
Alcona-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
84D:				
Liminga-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
Alcona-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
	Slope	0.37	Slope	0.37
84E:				
Liminga-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
Alcona-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	1.00
85B:				
Kalkaska-----	Not limited		Very limited	
			Cutbanks cave	1.00
Okeefe-----	Not limited		Very limited	
			Cutbanks cave	1.00
85D:				
Kalkaska-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
Okeefe-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
85E:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
85E: Okeefe-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
88B: Croswell-----	Somewhat limited Depth to saturated zone	0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
Au Gres-----	Very limited Depth to saturated zone Frost action	1.00 0.50	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
89A: Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to thick cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to thick cemented pan Depth to saturated zone Cutbanks cave	1.00 1.00 1.00
90D: Rousseau-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00
90E: Rousseau-----	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00
Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
90F: Rousseau-----	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00
Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00
91D: Rousseau-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
91E: Rousseau-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
91F: Rousseau-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
93F: Ontonagon-----	Very limited Shrink-swell Slope Frost action	1.00 1.00 0.50	Very limited Too clayey Slope Cutbanks cave	1.00 1.00 0.10
Pickford, occasionally flooded-----	Very limited Depth to saturated zone Frost action Flooding Shrink-swell	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 0.60 0.50 0.10
94A: Tawas-----	Very limited Depth to saturated zone Subsidence Frost action Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Content of organic matter	1.00 1.00 1.00 1.00
Spot-----	Very limited Depth to thin cemented pan Depth to saturated zone Ponding Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
94A:				
Finch-----	Very limited		Very limited	
	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
102:				
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
104B:				
Pence-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
104D:				
Pence-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
	Slope	0.37	Slope	0.37
104E:				
Pence-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	1.00
109D:				
Rousseau-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
109F:				
Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
			Slope	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
109F:				
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
110D:				
Au Gres-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Cutbanks cave	1.00
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Rubicon-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
110E:				
Au Gres-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	0.50	Cutbanks cave	1.00
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Rubicon-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
			Slope	1.00
116:				
Udipsamments-----	Not rated		Not rated	
Udorthents-----	Not rated		Not rated	
117D:				
Manistee, sandy substratum-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Too clayey	0.50
			Slope	0.37

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
120B:				
McMillan-----	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00
Trenary-----	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10
120D:				
McMillan-----	Somewhat limited Frost action Slope	0.50 0.37	Very limited Cutbanks cave Slope	1.00 0.37
Trenary-----	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Slope Cutbanks cave	0.37 0.10
120E:				
McMillan-----	Very limited Slope Frost action	1.00 0.50	Very limited Slope Cutbanks cave	1.00 1.00
Trenary-----	Very limited Slope Frost action	1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10
122:				
Pits, quarry-----	Not rated		Not rated	
126:				
Pickford-----	Very limited Depth to saturated zone Frost action Shrink-swell Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.50 0.10
129A:				
Rudyard-----	Very limited Depth to saturated zone Shrink-swell Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 1.00 0.10
130A:				
Rudyard-----	Very limited Depth to saturated zone Shrink-swell Frost action	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 1.00 0.10
Pickford-----	Very limited Depth to saturated zone Frost action Shrink-swell Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.50 0.10

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
132B: Sugar-----	Very limited		Very limited	
	Frost action	1.00	Depth to	1.00
	Depth to	0.75	saturated zone	
	saturated zone		Cutbanks cave	1.00
			Too clayey	1.00
133: Dorval-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Subsidence	1.00	Ponding	1.00
	Frost action	1.00	Content of	1.00
	Ponding	1.00	organic matter	
	Shrink-swell	1.00	Too clayey	0.50
			Cutbanks cave	0.10
143: Caffey-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
146A: Allendale-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Frost action	0.50	Cutbanks cave	1.00
			Too clayey	0.50
Fibre-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Shrink-swell	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00
	Frost action	0.50	Cutbanks cave	0.10
167D: Battydoe-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
	Slope	0.37	Slope	0.37
Wallace-----	Somewhat limited		Very limited	
	Depth to thin	1.00	Depth to thin	1.00
	cemented pan		cemented pan	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
173B: Paquin-----	Somewhat limited		Very limited	
	Depth to thin	1.00	Depth to thin	1.00
	cemented pan		cemented pan	
	Depth to	0.19	Depth to	1.00
	saturated zone		saturated zone	
			Cutbanks cave	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
173B:				
Finch-----	Very limited		Very limited	
	Depth to thick cemented pan	1.00	Depth to thick cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
174B:				
Croswell-----	Somewhat limited		Very limited	
	Depth to saturated zone	0.19	Depth to saturated zone	1.00
			Cutbanks cave	1.00
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
175D:				
Wallace-----	Somewhat limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
175E:				
Wallace-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Cutbanks cave	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
176B:				
Paquin-----	Somewhat limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	0.19	Depth to saturated zone	1.00
			Cutbanks cave	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
176B: Spot-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Cutbanks cave	1.00
	Frost action	0.50	Ponding	1.00
179B: Wallace-----	Somewhat limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
			Cutbanks cave	1.00
179D: Wallace-----	Somewhat limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
179E: Wallace-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
179F: Wallace-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
180B: Millecoquins-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.10
186D: Sporley-----	Very limited		Somewhat limited	
	Frost action	1.00	Slope	0.37
	Slope	0.37	Cutbanks cave	0.10
186E: Sporley-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	1.00	Cutbanks cave	0.10
186F: Sporley-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	1.00	Cutbanks cave	0.10

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
187B: Auger-----	Somewhat limited Frost action	0.50	Very limited Depth to saturated zone Cutbanks cave	1.00 0.50
188: Hendrie-----	Very limited Depth to saturated zone Frost action Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Cutbanks cave	1.00 1.00 0.10
189A: Bodi-----	Somewhat limited Depth to thick cemented pan Depth to saturated zone Frost action	0.90 0.75 0.50	Very limited Depth to thick cemented pan Depth to saturated zone Cutbanks cave Dense layer	1.00 1.00 1.00 0.50
Chesbrough-----	Very limited Depth to thin cemented pan Depth to saturated zone Frost action	1.00 1.00 1.00	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Dense layer	1.00 1.00 1.00 0.50
190B: Bodi-----	Somewhat limited Depth to thick cemented pan Depth to saturated zone Frost action	0.90 0.75 0.50	Very limited Depth to thick cemented pan Depth to saturated zone Cutbanks cave Dense layer	1.00 1.00 1.00 0.50
191D: Widgeon-----	Very limited Frost action Depth to saturated zone Slope	1.00 0.75 0.37	Very limited Depth to saturated zone Slope Cutbanks cave	1.00 0.37 0.10
Kalkaska-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
193A: Annaias-----	Very limited Depth to saturated zone Frost action	1.00 1.00	Very limited Depth to saturated zone Cutbanks cave	1.00 0.50

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
194A:				
Hendrie-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Cutbanks cave	0.10
Annaias-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.50
195A:				
Chesbrough-----	Very limited		Very limited	
	Depth to thin cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	1.00
			Dense layer	0.50
197D:				
Zandi-----	Somewhat limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00
	Slope	0.37	Slope	0.37
197E:				
Zandi-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	1.00
198B:				
Vilas-----	Not limited		Very limited	
			Cutbanks cave	1.00
198D:				
Vilas-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
199B:				
Auger-----	Somewhat limited		Very limited	
	Frost action	0.50	Depth to saturated zone	1.00
			Cutbanks cave	0.50
Annaias-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Cutbanks cave	0.50
200B:				
Pence-----	Not limited		Very limited	
			Cutbanks cave	1.00
200D:				
Pence-----	Somewhat limited		Very limited	
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
200E: Pence-----	Very limited Slope	1.00	Very limited Slope Cutbanks cave	1.00 1.00
201B: Croswell, rarely flooded-----	Somewhat limited Flooding Depth to saturated zone	0.40 0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
Deford, frequently flooded-----	Very limited Depth to saturated zone Flooding Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80
202B: Whitewash-----	Not limited		Very limited Cutbanks cave	1.00
203D: Frohling-----	Very limited Depth to thick cemented pan Frost action Slope	1.00 0.50 0.37	Very limited Depth to thick cemented pan Cutbanks cave Dense layer Slope	1.00 1.00 0.50 0.37
203E: Frohling-----	Very limited Depth to thick cemented pan Slope Frost action	1.00 1.00 0.50	Very limited Depth to thick cemented pan Slope Cutbanks cave Dense layer	1.00 1.00 1.00 0.50
204: Gogomain-----	Very limited Depth to saturated zone Frost action Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.50
205B: Kalkaska, burned---	Not limited		Very limited Cutbanks cave	1.00
205D: Kalkaska, burned---	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
206B: Deerton-----	Not limited		Very limited Cutbanks cave	1.00
			Depth to soft bedrock	0.20
			Depth to hard bedrock	0.08
211D: Frohling-----	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00
	Frost action	0.50	Cutbanks cave	1.00
	Slope	0.37	Dense layer	0.50
			Slope	0.37
Wallace-----	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00
	Slope	0.37	Cutbanks cave	1.00
			Slope	0.37
211E: Frohling-----	Very limited Depth to thick cemented pan	1.00	Very limited Depth to thick cemented pan	1.00
	Slope	1.00	Slope	1.00
	Frost action	0.50	Cutbanks cave	1.00
			Dense layer	0.50
Wallace-----	Very limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan	1.00
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
212: Markey-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
214D: Rousseau-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave	1.00
			Slope	0.37
Markey-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Subsidence	1.00	Cutbanks cave	1.00
	Frost action	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
214E:				
Rousseau-----	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00
Markey-----	Very limited Depth to saturated zone Subsidence Frost action Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Content of organic matter	1.00 1.00 1.00 1.00
215B:				
Wallace-----	Somewhat limited Depth to thin cemented pan	1.00	Very limited Depth to thin cemented pan Cutbanks cave	1.00 1.00
Alcona-----	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00
215D:				
Wallace-----	Somewhat limited Depth to thin cemented pan Slope	1.00 0.37	Very limited Depth to thin cemented pan Cutbanks cave Slope	1.00 1.00 0.37
Alcona-----	Somewhat limited Frost action Slope	0.50 0.37	Very limited Cutbanks cave Slope	1.00 0.37
246B:				
Garlic-----	Not limited		Very limited Cutbanks cave	1.00
246D:				
Garlic-----	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37
286B:				
Fence-----	Very limited Frost action Depth to saturated zone	1.00 0.75	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10
287B:				
Noseum-----	Somewhat limited Frost action Depth to saturated zone	0.50 0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00
300:				
Beaches-----	Not rated		Not rated	

Table 11b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations	
	Rating class and limiting features	Value	Rating class and limiting features	Value
W: Water-----	Not rated		Not rated	

Table 12a.--Sanitary Facilities

(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	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Very limited Restricted permeability Slope	1.00 0.37	Very limited Slope	1.00
15B: Liminga-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
15D: Liminga-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
15E: Liminga-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
15F: Liminga-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
16B: Graveraet-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 0.50
17C: Deer Park-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.68
17E: Deer Park-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
17F: Deer Park-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
18B: Rubicon-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
18D: Rubicon-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
18E: Rubicon-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
18F: Rubicon-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
19B: Kalkaska-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
19D: Kalkaska-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
19E: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
19F: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
20B: Croswell-----	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
21A: Finch-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
22: Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00
23: Leafriver-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
			Content of organic matter	1.00
24B: Springlake-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
29A: Solona-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Seepage	0.68
30: Kinross-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
			Content of organic matter	1.00
31B: McMillan-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
31D: McMillan-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
31E: McMillan-----	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
31F: McMillan-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
32A: Allendale-----	Very limited Restricted permeability Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
33: Pits-----	Not rated		Not rated	
35: Histosols-----	Very limited Restricted permeability Ponding Depth to saturated zone Subsidence	1.00 1.00 1.00 1.00	Very limited Ponding Content of organic matter Depth to saturated zone	1.00 1.00 1.00
Aquents-----	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
36: Carbondale-----	Very limited Depth to saturated zone Subsidence Ponding	1.00 1.00 1.00	Very limited Content of organic matter Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00
Lupton-----	Very limited Depth to saturated zone Subsidence Ponding	1.00 1.00 1.00	Very limited Content of organic matter Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00
Tawas-----	Very limited Depth to saturated zone Filtering capacity Subsidence Ponding	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
37:				
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Greenwood-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
Loxley-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
			Ponding	1.00
45D:				
Rubicon-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00
45E:				
Rubicon-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	1.00	Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00
46B:				
Kalkaska-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
46D: Kalkaska-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
46E: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
46F: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
47B: Trenary-----	Somewhat limited Restricted permeability	0.98	Somewhat limited Seepage Slope	0.32 0.32
47D: Trenary-----	Somewhat limited Restricted permeability Slope	0.98 0.37	Very limited Slope Seepage	1.00 0.32
53B: Menominee, sandy substratum-----	Very limited Filtering capacity Restricted permeability	1.00 0.50	Very limited Seepage Slope	1.00 0.32
57B: Amadon-----	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 0.50 0.32
Longrie-----	Very limited Depth to bedrock Restricted permeability	1.00 0.50	Very limited Depth to hard bedrock Seepage Slope	1.00 0.50 0.32
Rock outcrop-----	Not rated		Not rated	
57D: Amadon-----	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to hard bedrock Slope Seepage	1.00 1.00 0.50

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
57D:				
Longrie-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard	1.00
	Restricted	0.50	bedrock	
	permeability		Slope	1.00
	Slope	0.37	Seepage	0.50
Rock outcrop-----	Not rated		Not rated	
57E:				
Amadon-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard	1.00
	Slope	1.00	bedrock	
			Slope	1.00
			Seepage	0.50
Longrie-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard	1.00
	Slope	1.00	bedrock	
	Restricted	0.50	Slope	1.00
	permeability		Seepage	0.50
Rock outcrop-----	Not rated		Not rated	
60A:				
Kinross-----	Very limited		Very limited	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
	Filtering	1.00	saturated zone	
	capacity		Ponding	1.00
	Ponding	1.00	Content of	1.00
			organic matter	
Au Gres-----	Very limited		Very limited	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
	Filtering	1.00	saturated zone	
	capacity			
61B:				
Paquin-----	Very limited		Very limited	
	Depth to cemented	1.00	Depth to cemented	1.00
	pan		pan	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
			saturated zone	
			Slope	0.08
65B:				
Rubicon, organic				
surface-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	0.08
65D:				
Rubicon, organic				
surface-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	0.37		

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
65E: Rubicon, organic surface-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
66B: Kalkaska-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Kaks-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
66D: Kalkaska-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
Kaks-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
66E: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
Kaks-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
66F: Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
Kaks-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
74B: Menominee, sandy substratum-----	Very limited Filtering capacity Restricted permeability	1.00 0.50	Very limited Seepage Slope	1.00 0.32

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
74B:				
Graveraet-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Seepage	0.50
75D:				
Dillingham-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Seepage	1.00
			Slope	1.00
Kalkaska-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
75E:				
Dillingham-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Slope	1.00
			Seepage	1.00
Kalkaska-----	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
75F:				
Dillingham-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Slope	1.00
			Seepage	1.00
Kalkaska-----	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
76D:				
Menominee, sandy substratum-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.50	Slope	1.00
	Slope	0.37		
Trenary-----	Somewhat limited		Very limited	
	Restricted permeability	0.98	Slope	1.00
	Slope	0.37	Seepage	0.32

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
76E: Menominee, sandy substratum-----	Very limited Filtering capacity Slope Restricted permeability	1.00 1.00 0.50	Very limited Slope Seepage	1.00 1.00
Trenary-----	Very limited Slope Restricted permeability	1.00 0.98	Very limited Slope Seepage	1.00 0.32
84B: Liminga-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Alcona-----	Somewhat limited Restricted permeability	0.50	Very limited Seepage Slope	1.00 0.08
84D: Liminga-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
Alcona-----	Somewhat limited Restricted permeability Slope	0.50 0.37	Very limited Slope Seepage	1.00 1.00
84E: Liminga-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
Alcona-----	Very limited Slope Restricted permeability	1.00 0.50	Very limited Slope Seepage	1.00 1.00
85B: Kalkaska-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
Okeefe-----	Very limited Filtering capacity Restricted permeability	1.00 0.50	Very limited Seepage Slope	1.00 0.08

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
85D:				
Kalkaska-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
Okeefe-----	Very limited Filtering capacity Restricted permeability Slope	1.00 0.50 0.37	Very limited Seepage Slope	1.00 1.00
85E:				
Kalkaska-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
Okeefe-----	Very limited Filtering capacity Slope Restricted permeability	1.00 1.00 0.50	Very limited Slope Seepage	1.00 1.00
88B:				
Croswell-----	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Au Gres-----	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
89A:				
Spot-----	Very limited Depth to cemented pan Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
90D:				
Rousseau-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	0.37		
Spot-----	Very limited		Very limited	
	Depth to cemented	1.00	Depth to cemented	1.00
	pan		pan	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
	Ponding	1.00	saturated zone	
			Ponding	1.00
			Content of	1.00
			organic matter	
90E:				
Rousseau-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	1.00		
Spot-----	Very limited		Very limited	
	Depth to cemented	1.00	Depth to cemented	1.00
	pan		pan	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
	Ponding	1.00	saturated zone	
			Ponding	1.00
			Content of	1.00
			organic matter	
90F:				
Rousseau-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	1.00		
Spot-----	Very limited		Very limited	
	Depth to cemented	1.00	Depth to cemented	1.00
	pan		pan	
	Depth to	1.00	Seepage	1.00
	saturated zone		Depth to	1.00
	Ponding	1.00	saturated zone	
			Ponding	1.00
			Content of	1.00
			organic matter	
91D:				
Rousseau-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	0.37		
91E:				
Rousseau-----	Very limited		Very limited	
	Filtering	1.00	Slope	1.00
	capacity		Seepage	1.00
	Slope	1.00		

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
91F: Rousseau-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
93F: Ontonagon-----	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope	1.00
Pickford, occasionally flooded-----	Very limited Flooding Restricted permeability Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
94A: Tawas-----	Very limited Depth to saturated zone Filtering capacity Subsidence Ponding	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00
Spot-----	Very limited Depth to cemented pan Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00
102: Spot-----	Very limited Depth to cemented pan Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
102: Dawson-----	Very limited Depth to saturated zone Filtering capacity Subsidence Ponding	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00
104B: Pence-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
104D: Pence-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
104E: Pence-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Slope Seepage	1.00 1.00
109D: Rousseau-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Filtering capacity Subsidence Ponding	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00
109F: Rousseau-----	Very limited Filtering capacity Slope	1.00 1.00	Very limited Seepage Slope	1.00 1.00
Dawson-----	Very limited Depth to saturated zone Filtering capacity Subsidence Ponding	1.00 1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00
110D: Au Gres-----	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
110D:				
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Rubicon-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
110E:				
Au Gres-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
Dawson-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
Rubicon-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	1.00	Slope	1.00
116:				
Udipsamments-----	Not rated		Not rated	
Udorthents-----	Not rated		Not rated	
117D:				
Manistee, sandy substratum-----	Very limited		Very limited	
	Restricted permeability	1.00	Seepage	1.00
	Filtering capacity	1.00	Slope	1.00
	Slope	0.37		
120B:				
McMillan-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
Trenary-----	Somewhat limited		Somewhat limited	
	Restricted permeability	0.98	Seepage	0.32
			Slope	0.32

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
120D:				
McMillan-----	Very limited		Very limited	
	Filtering	1.00	Seepage	1.00
	capacity		Slope	1.00
	Slope	0.37		
Trenary-----	Somewhat limited		Very limited	
	Restricted	0.98	Slope	1.00
	permeability		Seepage	0.32
	Slope	0.37		
120E:				
McMillan-----	Very limited		Very limited	
	Filtering	1.00	Slope	1.00
	capacity		Seepage	1.00
	Slope	1.00		
Trenary-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted	0.98	Seepage	0.32
	permeability			
122:				
Pits, quarry-----	Not rated		Not rated	
126:				
Pickford-----	Very limited		Very limited	
	Restricted	1.00	Depth to	1.00
	permeability		saturated zone	
	Depth to	1.00	Ponding	1.00
	saturated zone			
	Ponding	1.00		
129A:				
Rudyard-----	Very limited		Very limited	
	Restricted	1.00	Depth to	1.00
	permeability		saturated zone	
	Depth to	1.00		
	saturated zone			
130A:				
Rudyard-----	Very limited		Very limited	
	Restricted	1.00	Depth to	1.00
	permeability		saturated zone	
	Depth to	1.00		
	saturated zone			
Pickford-----	Very limited		Very limited	
	Restricted	1.00	Depth to	1.00
	permeability		saturated zone	
	Depth to	1.00	Ponding	1.00
	saturated zone			
	Ponding	1.00		
132B:				
Sugar-----	Very limited		Very limited	
	Restricted	1.00	Depth to	1.00
	permeability		saturated zone	
	Depth to	1.00	Seepage	0.50
	saturated zone		Slope	0.08

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
133: Dorval-----	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
143: Caffey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
			Content of organic matter	1.00
146A: Allendale-----	Very limited		Very limited	
	Restricted permeability	1.00	Seepage	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00		
Fibre-----	Very limited		Very limited	
	Restricted permeability	1.00	Seepage	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
			Content of organic matter	1.00
167D: Battydoe-----	Somewhat limited		Very limited	
	Restricted permeability	0.50	Slope	1.00
	Slope	0.37	Seepage	0.50
Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Seepage	1.00
			Slope	1.00
173B: Paquin-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
			Depth to saturated zone	1.00
			Slope	0.08

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
173B:				
Finch-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
			Depth to saturated zone	1.00
174B:				
Croswell-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00
175D:				
Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Seepage	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00
175E:				
Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Seepage	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Ponding	1.00	Depth to saturated zone	1.00
			Ponding	1.00
			Content of organic matter	1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
176B: Paquin-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Slope	1.00 1.00 1.00 0.08
Spot-----	Very limited Depth to cemented pan Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
179B: Wallace-----	Very limited Depth to cemented pan	1.00	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.08
179D: Wallace-----	Very limited Depth to cemented pan Slope	1.00 0.37	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 1.00
179E: Wallace-----	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
179F: Wallace-----	Very limited Depth to cemented pan Slope	1.00 1.00	Very limited Depth to cemented pan Slope Seepage	1.00 1.00 1.00
180B: Millecoquins-----	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Slope	1.00 0.08
186D: Sporley-----	Very limited Restricted permeability Slope	1.00 0.37	Very limited Slope Seepage	1.00 0.18

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
186E: Sporley-----	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Seepage	1.00 0.18
186F: Sporley-----	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Seepage	1.00 0.18
187B: Auger-----	Very limited Depth to saturated zone Restricted permeability	1.00 0.50	Very limited Depth to saturated zone Seepage Slope	1.00 0.50 0.08
188: Hendrie-----	Very limited Depth to saturated zone Ponding Restricted permeability	1.00 1.00 0.32	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.68
189A: Bodi-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Slope	1.00 1.00 1.00 0.08
Chesbrough-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 0.82
190B: Bodi-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone Slope	1.00 1.00 1.00 0.08
191D: Widgeon-----	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.37	Very limited Slope Depth to saturated zone Seepage	1.00 1.00 0.50

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
191D: Kalkaska-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
193A: Annaiias-----	Very limited Depth to saturated zone Restricted permeability	1.00 0.32	Very limited Seepage Depth to saturated zone	1.00 1.00
194A: Hendrie-----	Very limited Depth to saturated zone Ponding Restricted permeability	1.00 1.00 0.32	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.68
Annaiias-----	Very limited Depth to saturated zone Restricted permeability	1.00 0.32	Very limited Seepage Depth to saturated zone	1.00 1.00
195A: Chesbrough-----	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 0.82
197D: Zandi-----	Somewhat limited Restricted permeability Slope	0.50 0.37	Very limited Slope Seepage	1.00 0.50
197E: Zandi-----	Very limited Slope Restricted permeability	1.00 0.50	Very limited Slope Seepage	1.00 0.50
198B: Vilas-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
198D: Vilas-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
199B:				
Auger-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.50	Seepage Slope	0.50 0.08
Annanias-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Restricted permeability	0.32	Depth to saturated zone	1.00
200B:				
Pence-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage Slope	1.00 0.08
200D:				
Pence-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage Slope	1.00 1.00
	Slope	0.37		
200E:				
Pence-----	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
201B:				
Croswell, rarely flooded-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40
			Slope	0.08
Deford, frequently flooded-----	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
			Content of organic matter	1.00
202B:				
Whitewash-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
203D:				
Frohling-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	1.00
			Seepage	0.50

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
203E: Frohling-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Slope	1.00
			Seepage	0.50
204: Gogomain-----	Very limited		Very limited	
	Restricted permeability	1.00	Seepage	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
			Content of organic matter	1.00
205B: Kalkaska, burned----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
205D: Kalkaska, burned----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
206B: Deerton-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
			Depth to hard bedrock	0.08
211D: Frohling-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	1.00
			Seepage	0.50
Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Seepage	1.00
			Slope	1.00
211E: Frohling-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Slope	1.00
			Seepage	0.50
Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	1.00	Slope	1.00
			Seepage	1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
212: Markey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
214D: Rousseau-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.37	Slope	1.00
Markey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
214E: Rousseau-----	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	1.00	Slope	1.00
Markey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Ponding	1.00
	Ponding	1.00	Content of organic matter	1.00
215B: Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
			Seepage	1.00
			Slope	0.08
Alcona-----	Somewhat limited		Very limited	
	Restricted permeability	0.50	Seepage	1.00
			Slope	0.08
215D: Wallace-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Seepage	1.00
			Slope	1.00
Alcona-----	Somewhat limited		Very limited	
	Restricted permeability	0.50	Slope	1.00
	Slope	0.37	Seepage	1.00

Table 12a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
246B: Garlic-----	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.08
246D: Garlic-----	Very limited Filtering capacity Slope	1.00 0.37	Very limited Seepage Slope	1.00 1.00
286B: Fence-----	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Seepage Slope	1.00 0.18 0.08
287B: Noseum-----	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
300: Beaches-----	Not rated		Not rated	
W: Water-----	Not rated		Not rated	

Table 12b.--Sanitary Facilities

(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	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
10D: Ontonagon-----	Very limited Too clayey Slope	1.00 0.37	Somewhat limited Slope	0.37	Very limited Too clayey Hard to compact Slope	1.00 1.00 0.37
15B: Liminga-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
15D: Liminga-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
15E: Liminga-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
15F: Liminga-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
16B: Graveraet-----	Very limited Depth to saturated zone Depth to thin cemented pan	1.00 0.50	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00
17C: Deer Park-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
17E: Deer Park-----	Very limited Seepage Too sandy Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00	Very limited Too sandy Seepage Slope	1.00 1.00 1.00
17F: Deer Park-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00

Table 12b.--Sanitary Facilities--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
18B: Rubicon-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
18D: Rubicon-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
18E: Rubicon-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
18F: Rubicon-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
19B: Kalkaska-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
19D: Kalkaska-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
19E: Kalkaska-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
19F: Kalkaska-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00
20B: Croswell-----	Very limited Depth to saturated zone Seepage Too sandy	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Too sandy Seepage Depth to saturated zone	1.00 1.00 0.86
21A: Finch-----	Very limited Depth to saturated zone Depth to thick cemented pan Seepage Too sandy	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00 1.00

Table 12b.--Sanitary Facilities--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
22: Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
23: Leafriver-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
24B: Springlake-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
29A: Solona-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
30: Kinross-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
31B: McMillan-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
31D: McMillan-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
31E: McMillan-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
31F: McMillan-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00

Table 12b.--Sanitary Facilities--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
32A:						
Allendale-----	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	Seepage	1.00	Too clayey	1.00
					Hard to compact	1.00
33:						
Pits-----	Not rated		Not rated		Not rated	
35:						
Histosols-----	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
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
					Seepage	0.16
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
36:						
Carbondale-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Seepage	0.21
Lupton-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Seepage	0.16
Tawas-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
37:						
Dawson-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00

Table 12b.--Sanitary Facilities--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
37:						
Greenwood-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Seepage	0.21
Loxley-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Seepage	0.15
45D:						
Rubicon-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
45E:						
Rubicon-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
46B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
46D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37

Table 12b.--Sanitary Facilities--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
46E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
46F:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
47B:						
Trenary-----	Not limited		Not limited		Not limited	
47D:						
Trenary-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37	Slope	0.37
53B:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
57B:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Longrie-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Rock outcrop-----	Not rated		Not rated		Not rated	
57D:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.37	Slope	0.37	Slope	0.37
Longrie-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	0.37	Slope	0.37	Slope	0.37
Rock outcrop-----	Not rated		Not rated		Not rated	
57E:						
Amadon-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Longrie-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Rock outcrop-----	Not rated		Not rated		Not rated	

Table 12b.--Sanitary Facilities--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
60A:						
Kinross-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
61B:						
Paquin-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to cemented	1.00	Depth to cemented	1.00
	saturated zone		pan		pan	
	Seepage	1.00	Depth to	1.00	Too sandy	1.00
	Too sandy	1.00	saturated zone		Seepage	1.00
	Depth to thin	0.50	Seepage	1.00	Depth to	0.86
	cemented pan				saturated zone	
65B:						
Rubicon, organic	Very limited		Very limited		Very limited	
surface-----	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
65D:						
Rubicon, organic	Very limited		Very limited		Very limited	
surface-----	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
65E:						
Rubicon, organic	Very limited		Very limited		Very limited	
surface-----	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
66B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Kaks-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
66D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37

Table 12b.--Sanitary Facilities--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
66D:						
Kaks-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
66E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Kaks-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
66F:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Kaks-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
74B:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Graveraet-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to thin cemented pan	0.50	Depth to saturated zone	1.00	Depth to saturated zone	1.00
75D:						
Dillingham-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to thin cemented pan	0.50	Seepage	1.00	Seepage	0.52
	Too sandy	0.50	Slope	0.37	Too sandy	0.50
	Slope	0.37			Slope	0.37
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
75E:						
Dillingham-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Slope	1.00	Slope	1.00
	Depth to thin cemented pan	0.50	Seepage	1.00	Seepage	0.52
	Too sandy	0.50			Too sandy	0.52

Table 12b.--Sanitary Facilities--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
75E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
75F:						
Dillingham-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented	1.00	Depth to cemented	1.00
	Seepage	1.00	pan		pan	
	Depth to thin	0.50	Slope	1.00	Slope	1.00
	cemented pan		Seepage	1.00	Seepage	0.52
	Too sandy	0.50			Too sandy	0.50
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
76D:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Trenary-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37	Slope	0.37
76E:						
Menominee, sandy substratum-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Trenary-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
84B:						
Liminga-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Alcona-----	Somewhat limited		Not limited		Somewhat limited	
	Too sandy	0.50			Too sandy	0.50
84D:						
Liminga-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Alcona-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.50	Slope	0.37	Too sandy	0.50
	Slope	0.37			Slope	0.37

Table 12b.--Sanitary Facilities--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
84E:						
Liminga-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Alcona-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too sandy	0.50			Too sandy	0.50
85B:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Okeefe-----	Not limited		Very limited		Not limited	
			Seepage	1.00		
85D:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Okeefe-----	Somewhat limited		Very limited		Somewhat limited	
	Slope	0.37	Seepage	1.00	Slope	0.37
			Slope	0.37		
85E:						
Kalkaska-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Okeefe-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Seepage	1.00		
88B:						
Croswell-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Too sandy	1.00
	saturated zone		saturated zone		Seepage	1.00
	Seepage	1.00	Seepage	1.00	Depth to	0.86
	Too sandy	1.00			saturated zone	
Au Gres-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
89A:						
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to cemented	1.00	Depth to cemented	1.00
	saturated zone		pan		pan	
	Seepage	1.00	Depth to	1.00	Depth to	1.00
	Ponding	1.00	saturated zone		saturated zone	
	Content of	1.00	Seepage	1.00	Seepage	1.00
	organic matter		Ponding	1.00	Ponding	1.00
	Depth to thin	0.50	cemented pan		Content of	1.00
	cemented pan				organic matter	

Table 12b.--Sanitary Facilities--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
89A:						
Finch-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to thick cemented pan	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
90D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
90E:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
90F:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00

Table 12b.--Sanitary Facilities--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
91D: Rousseau-----	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
91E: Rousseau-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
91F: Rousseau-----	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
93F: Ontonagon-----	Very limited Too clayey	1.00	Very limited Slope	1.00	Very limited Too clayey	1.00
	Slope	1.00			Hard to compact	1.00
					Slope	1.00
Pickford, occasionally flooded-----	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Depth to	1.00
	Depth to	1.00	Depth to	1.00	saturated zone	
	saturated zone		saturated zone		Too clayey	1.00
	Too clayey	1.00			Hard to compact	1.00
94A: Tawas-----	Very limited Depth to	1.00	Very limited Depth to	1.00	Very limited Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
Spot-----	Very limited Depth to	1.00	Very limited Depth to cemented	1.00	Very limited Depth to cemented	1.00
	saturated zone		pan		pan	
	Seepage	1.00	Depth to	1.00	Depth to	1.00
	Ponding	1.00	saturated zone		saturated zone	
	Content of	1.00	Seepage	1.00	Seepage	1.00
	organic matter		Ponding	1.00	Ponding	1.00
	Depth to thin	0.50			Content of	1.00
	cemented pan				organic matter	
Finch-----	Very limited Depth to	1.00	Very limited Depth to cemented	1.00	Very limited Depth to cemented	1.00
	saturated zone		pan		pan	
	Depth to thick	1.00	Depth to	1.00	Depth to	1.00
	cemented pan		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00

Table 12b.--Sanitary Facilities--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
102:						
Spot-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to cemented	1.00	Depth to cemented	1.00
	saturated zone		pan		pan	
	Seepage	1.00	Depth to	1.00	Depth to	1.00
	Ponding	1.00	saturated zone		saturated zone	
	Content of	1.00	Seepage	1.00	Seepage	1.00
	organic matter		Ponding	1.00	Ponding	1.00
	Depth to thin	0.50			Content of	1.00
	cemented pan				organic matter	
Dawson-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
104B:						
Pence-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
104D:						
Pence-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
104E:						
Pence-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
109D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Dawson-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
109F:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
Dawson-----	Very limited		Very limited		Very limited	
	Depth to	1.00	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone		saturated zone	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00

Table 12b.--Sanitary Facilities--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
110D:						
Au Gres-----	Very limited Depth to saturated zone Seepage Too sandy	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00 1.00
Dawson-----	Very limited Depth to saturated zone Seepage Too sandy Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage Ponding	1.00 1.00 1.00 1.00 1.00
Rubicon-----	Very limited Seepage Too sandy Slope	1.00 1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 1.00 0.37
110E:						
Au Gres-----	Very limited Depth to saturated zone Seepage Too sandy	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00 1.00
Dawson-----	Very limited Depth to saturated zone Seepage Too sandy Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Too sandy Seepage Ponding	1.00 1.00 1.00 1.00 1.00
Rubicon-----	Very limited Seepage Too sandy Slope	1.00 1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00	Very limited Too sandy Seepage Slope	1.00 1.00 1.00 1.00
116:						
Udipsamments-----	Not rated		Not rated		Not rated	
Udorthents-----	Not rated		Not rated		Not rated	
117D:						
Manistee, sandy substratum-----	Very limited Seepage Too clayey Slope	1.00 1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too clayey Hard to compact Slope	1.00 1.00 1.00 0.37
120B:						
McMillan-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
Trenary-----	Not limited		Not limited		Not limited	

Table 12b.--Sanitary Facilities--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
120D:						
McMillan-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Trenary-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37	Slope	0.37
120E:						
McMillan-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Trenary-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
122:						
Pits, quarry-----	Not rated		Not rated		Not rated	
126:						
Pickford-----	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	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
129A:						
Rudyard-----	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
130A:						
Rudyard-----	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
Pickford-----	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	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
132B:						
Sugar-----	Very limited		Very limited		Very limited	
	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
					Depth to saturated zone	1.00

Table 12b.--Sanitary Facilities--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
133: Dorval-----	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
143: Caffey-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
146A: Allendale-----	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
Fibre-----	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
167D: Battydoe-----	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37
Wallace-----	Very limited Seepage Too sandy Depth to thin cemented pan Slope	1.00 1.00 0.50 0.37	Very limited Depth to cemented pan Seepage Slope	1.00 1.00 0.37	Very limited Depth to cemented pan Too sandy Seepage Slope	1.00 1.00 1.00 0.37
173B: Paquin-----	Very limited Depth to saturated zone Seepage Too sandy Depth to thin cemented pan	1.00 1.00 1.00 0.50	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to cemented pan Too sandy Seepage Depth to saturated zone	1.00 1.00 1.00 0.86
Finch-----	Very limited Depth to saturated zone Depth to thick cemented pan Seepage Too sandy	1.00 1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Too sandy Seepage	1.00 1.00 1.00 1.00

Table 12b.--Sanitary Facilities--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
174B:						
Croswell-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00			Depth to saturated zone	0.86
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
175D:						
Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
175E:						
Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Slope	1.00	Slope	1.00	Seepage	1.00
	Depth to thin cemented pan	0.50			Slope	1.00
Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
176B:						
Paquin-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Too sandy	1.00	Seepage	1.00	Seepage	1.00
	Depth to thin cemented pan	0.50			Depth to saturated zone	0.86

Table 12b.--Sanitary Facilities--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
176B: Spot-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00	Seepage	1.00
	Content of organic matter	1.00	Ponding	1.00	Ponding	1.00
	Depth to thin cemented pan	0.50			Content of organic matter	1.00
179B: Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50			Seepage	1.00
179D: Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
179E: Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Slope	1.00	Slope	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50			Seepage	1.00
179F: Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Slope	1.00	Slope	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50			Seepage	1.00
180B: Millecoquins-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
186D: Sporley-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.37	Slope	0.37	Slope	0.37
186E: Sporley-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
186F: Sporley-----	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00

Table 12b.--Sanitary Facilities--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
187B: Auger-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.47
188: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
189A: Bodi-----	Very limited Depth to saturated zone Depth to thick cemented pan Too sandy	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00	Very limited Depth to cemented pan Too sandy Depth to saturated zone Seepage	1.00 1.00 1.00 0.50
Chesbrough-----	Very limited Depth to saturated zone Depth to thin cemented pan Too sandy	1.00 0.50 0.50	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Too sandy	1.00 1.00 0.50
190B: Bodi-----	Very limited Depth to saturated zone Depth to thick cemented pan Too sandy	1.00 1.00 1.00	Very limited Depth to cemented pan Seepage Depth to saturated zone	1.00 1.00 1.00	Very limited Depth to cemented pan Too sandy Depth to saturated zone Seepage	1.00 1.00 1.00 0.50
191D: Widgeon-----	Very limited Depth to saturated zone Too clayey Slope	1.00 0.50 0.37	Very limited Depth to saturated zone Slope	1.00 0.37	Very limited Depth to saturated zone Too clayey Slope	1.00 0.50 0.37
Kalkaska-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
193A: Annaias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
194A: Hendrie-----	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00

Table 12b.--Sanitary Facilities--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
194A: Annaias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
195A: Chesbrough-----	Very limited Depth to saturated zone Depth to thin cemented pan Too sandy	1.00 0.50 0.50	Very limited Depth to cemented pan Depth to saturated zone	1.00 1.00	Very limited Depth to cemented pan Depth to saturated zone Too sandy	1.00 1.00 0.50
197D: Zandi-----	Somewhat limited Too sandy Slope	0.50 0.37	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37
197E: Zandi-----	Very limited Slope Too sandy	1.00 0.50	Very limited Slope	1.00	Very limited Slope	1.00
198B: Vilas-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
198D: Vilas-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
199B: Auger-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.47
Annaias-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00
200B: Pence-----	Very limited Seepage Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
200D: Pence-----	Very limited Seepage Too sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too sandy Seepage Slope	1.00 1.00 0.37
200E: Pence-----	Very limited Slope Seepage Too sandy	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00	Very limited Slope Too sandy Seepage	1.00 1.00 1.00

Table 12b.--Sanitary Facilities--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
201B: Crowell, rarely flooded-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00	Flooding	0.40	Depth to saturated zone	0.86
	Flooding	0.40				
Deford, frequently flooded-----	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	Too sandy	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00				
202B: Whitewash-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
203D: Frohling-----	Very limited		Very limited		Very limited	
	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	0.37	Slope	0.37
203E: Frohling-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to thick cemented pan	1.00	Slope	1.00	Slope	1.00
204: Gogomain-----	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	Seepage	1.00	Too clayey	1.00
	Ponding	1.00	Ponding	1.00	Hard to compact	1.00
					Ponding	1.00
205B: Kalkaska, burned----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
205D: Kalkaska, burned----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
206B: Deerton-----	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	1.00
	Too sandy	0.50			Too sandy	0.50

Table 12b.--Sanitary Facilities--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
211D:						
Frohling-----	Very limited		Very limited		Very limited	
	Depth to thick cemented pan	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Slope	0.37	Slope	0.37	Slope	0.37
Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
211E:						
Frohling-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Depth to thick cemented pan	1.00	Slope	1.00	Slope	1.00
Wallace-----	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Seepage	1.00	Slope	1.00	Slope	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	1.00
	Depth to thin cemented pan	0.50			Seepage	1.00
212:						
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
214D:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
214E:						
Rousseau-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
Markey-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	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	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00

Table 12b.--Sanitary Facilities--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
215B:						
Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00			Too sandy	1.00
	Depth to thin cemented pan	0.50	Seepage	1.00	Seepage	1.00
Alcona-----	Somewhat limited		Not limited		Somewhat limited	
	Too sandy	0.50			Too sandy	0.50
215D:						
Wallace-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to cemented pan	1.00	Depth to cemented pan	1.00
	Too sandy	1.00			Too sandy	1.00
	Depth to thin cemented pan	0.50	Seepage	1.00	Seepage	1.00
	Slope	0.37	Slope	0.37	Slope	0.37
Alcona-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Too sandy	0.50	Slope	0.37	Too sandy	0.50
	Slope	0.37			Slope	0.37
246B:						
Garlic-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
246D:						
Garlic-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.37	Seepage	1.00
	Slope	0.37			Slope	0.37
286B:						
Fence-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
287B:						
Noseum-----	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00			Depth to saturated zone	0.86
300:						
Beaches-----	Not rated		Not rated		Not rated	
W:						
Water-----	Not rated		Not rated		Not rated	

Table 13a.--Construction Materials

(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	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
10D: Ontonagon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
15B: Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
15D: Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
15E: Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
15F: Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
16B: Graveraet-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
17C: Deer Park-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.91
	Thickest layer	0.00	Thickest layer	0.91
17E: Deer Park-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.91
	Thickest layer	0.00	Thickest layer	0.91
17F: Deer Park-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.91
	Thickest layer	0.00	Thickest layer	0.91
18B: Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
18D: Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
18E: Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
18F: Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
19B: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
19D: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
19E: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
19F: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
20B: Croswell-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
21A: Finch-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.43
22: Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
23: Leafriver-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.36
24B: Springlake-----	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.10
	Bottom layer	0.60	Bottom layer	0.66

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
29A: Solona-----	Fair		Poor	
	Thickest layer	0.00	Bottom layer	0.00
	Bottom layer	0.64	Thickest layer	0.00
30: Kinross-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.37
	Thickest layer	0.00	Bottom layer	0.95
31B: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
31D: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
31E: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
31F: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
32A: Allendale-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.36
33: Pits-----	Not rated		Not rated	
35: Histosols-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Aquents-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
36: Carbondale-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Lupton-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Tawas-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.91

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
37:				
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25
Greenwood-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Loxley-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
45D:				
Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
45E:				
Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
46B:				
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
46D:				
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
46E:				
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
46F:				
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
47B:				
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
47D:				
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
53B: Menominee, sandy substratum-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.40
	Thickest layer	0.00	Bottom layer	0.64
57B: Amadon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Longrie-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.01
Rock outcrop-----	Not rated		Not rated	
57D: Amadon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Longrie-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.01
Rock outcrop-----	Not rated		Not rated	
57E: Amadon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Longrie-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.01
Rock outcrop-----	Not rated		Not rated	
60A: Kinross-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.37
	Thickest layer	0.00	Bottom layer	0.95
Au Gres-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
61B: Paquin-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.95
65B: Rubicon, organic surface-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
65D: Rubicon, organic surface-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
65E: Rubicon, organic surface-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
66B: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.09
	Thickest layer	0.00	Bottom layer	0.82
66D: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.09
	Thickest layer	0.00	Bottom layer	0.82
66E: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.09
	Thickest layer	0.00	Bottom layer	0.82
66F: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.09
	Thickest layer	0.00	Bottom layer	0.82
74B: Menominee, sandy substratum-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.40
	Thickest layer	0.00	Bottom layer	0.64
	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
75D:				
Dillingham-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.68
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
75E:				
Dillingham-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.68
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
75F:				
Dillingham-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.68
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
76D:				
Menominee, sandy substratum-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.40
	Thickest layer	0.00	Bottom layer	0.64
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
76E:				
Menominee, sandy substratum-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.40
	Thickest layer	0.00	Bottom layer	0.64
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
84B:				
Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
Alcona-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
84D:				
Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
84D: Alcona-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
84E: Liminga-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.45
	Thickest layer	0.00	Thickest layer	0.45
Alcona-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
85B: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Okeefe-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.23
85D: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Okeefe-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.23
85E: Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Okeefe-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.23
88B: Crowell-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Au Gres-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
89A: Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
Finch-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.43

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
90D:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
90E:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
90F:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
91D:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
91E:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
91F:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
93F:				
Ontonagon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Pickford, occasionally flooded-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
94A:				
Tawas-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.91

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
94A:				
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
Finch-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.43
102:				
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25
104B:				
Pence-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.80
	Thickest layer	0.00	Thickest layer	0.80
104D:				
Pence-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.80
	Thickest layer	0.00	Thickest layer	0.80
104E:				
Pence-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.80
	Thickest layer	0.00	Thickest layer	0.80
109D:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25
109F:				
Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25
110D:				
Au Gres-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
110D: Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
110E: Au Gres-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Dawson-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.25
Rubicon-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.82
	Thickest layer	0.00	Thickest layer	0.82
116: Udipsamments-----	Not rated		Not rated	
Udorthents-----	Not rated		Not rated	
117D: Manistee, sandy substratum-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.09
120B: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
120D: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
120E: McMillan-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.35
	Thickest layer	0.00	Thickest layer	0.58
Trenary-----	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.03
122: Pits, quarry-----	Not rated		Not rated	

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
126: Pickford-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
129A: Rudyard-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
130A: Rudyard-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Pickford-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
132B: Sugar-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
133: Dorval-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
143: Caffey-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.03
146A: Allendale-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.36
Fibre-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.82
167D: Battydoe-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
173B: Paquin-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.95
Finch-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.43

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
174B:				
Croswell-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
175D:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Bottom layer	0.25
175E:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
176B:				
Paquin-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.95
Spot-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.64
179B:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
179D:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
179E:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
179F:				
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
180B: Millecoquins-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
186D: Sporley-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
186E: Sporley-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
186F: Sporley-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
187B: Auger-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
188: Hendrie-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
189A: Bodi-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.09
Chesbrough-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02
190B: Bodi-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.09
191D: Widgeon-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Kalkaska-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
193A: Annianas-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
194A:				
Hendrie-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Annaiias-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
195A:				
Chesbrough-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02
197D:				
Zandi-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.11
197E:				
Zandi-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.11
198B:				
Vilas-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.82
	Thickest layer	0.00	Bottom layer	0.95
198D:				
Vilas-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.82
	Thickest layer	0.00	Bottom layer	0.95
199B:				
Auger-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
Annaiias-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
200B:				
Pence-----	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.66
	Bottom layer	0.64	Bottom layer	0.91
200D:				
Pence-----	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.66
	Bottom layer	0.64	Bottom layer	0.91
200E:				
Pence-----	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.66
	Bottom layer	0.64	Bottom layer	0.91

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
201B: Croswell, rarely flooded-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
Deford, frequently flooded-----	Poor		Good	
	Bottom layer	0.00	Bottom layer	0.10
	Thickest layer	0.00		
202B: Whitewash-----	Poor		Good	
	Bottom layer	0.00	Thickest layer	0.23
	Thickest layer	0.00		
203D: Frohling-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02
203E: Frohling-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02
204: Gogomain-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00
205B: Kalkaska, burned----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
205D: Kalkaska, burned----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.64
	Thickest layer	0.00	Thickest layer	0.64
206B: Deerton-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.08
	Thickest layer	0.00	Bottom layer	0.86
211D: Frohling-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02
Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
211E: Frohling-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.02

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
211E: Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
212: Markey-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.86
214D: Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
	Markey-----	Poor	Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.86
214E: Rousseau-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.25
	Thickest layer	0.00	Bottom layer	0.64
	Markey-----	Poor	Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.86
215B: Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
	Alcona-----	Poor	Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
215D: Wallace-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.93
	Alcona-----	Poor	Fair	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.07
246B: Garlic-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.91
	Thickest layer	0.00	Thickest layer	0.91
246D: Garlic-----	Poor		Fair	
	Bottom layer	0.00	Bottom layer	0.91
	Thickest layer	0.00	Thickest layer	0.91
286B: Fence-----	Poor		Poor	
	Bottom layer	0.00	Bottom layer	0.00
	Thickest layer	0.00	Thickest layer	0.00

Table 13a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
287B:				
Noseum-----	Poor		Fair	
	Bottom layer	0.00	Thickest layer	0.00
	Thickest layer	0.00	Bottom layer	0.91
300:				
Beaches-----	Not rated		Not rated	
W:				
Water-----	Not rated		Not rated	

Table 13b.--Construction Materials

(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	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Shrink-swell	0.12	Slope	0.63
	Too acid	0.68				
	Water erosion	0.90				
15B: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.12
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.85				
15D: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.12
	Low content of organic matter	0.12			Slope	0.63
	Too acid	0.50				
	Droughty	0.85				
15E: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.12
	Too acid	0.50				
	Droughty	0.85				
15F: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.12
	Too acid	0.50				
	Droughty	0.85				
16B: Graveraet-----	Poor		Poor		Poor	
	Droughty	0.00	Depth to saturated zone	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Too acid	0.16	Low strength	0.00	Depth to cemented pan	0.00
	Carbonate content	0.92			Too acid	0.99
	Water erosion	0.99				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
17C: Deer Park-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.88
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.79				
17E: Deer Park-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.92	Slope	0.00
	Low content of organic matter	0.12			Too acid	0.88
	Too acid	0.50				
	Droughty	0.79				
17F: Deer Park-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.88
	Too acid	0.50				
	Droughty	0.79				
18B: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
18D: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
18E: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
18F: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
19B: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
19D: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
19E: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
19F: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
20B: Crowell-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to	0.53	Depth to	0.53
	Low content of organic matter	0.12	saturated zone		saturated zone	
	Too acid	0.50				
	Droughty	0.72				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21A: Finch-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Droughty	0.00	Depth to cemented	0.00	saturated zone	
	Depth to cemented	0.00	pan		Depth to cemented	0.00
	pan		Low strength	0.00	pan	
	Too acid	0.08			Too acid	0.88
22: Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	Depth to cemented	0.00	saturated zone	
	pan		pan		Depth to cemented	0.00
	Too acid	0.50	Low strength	0.00	pan	
	Low content of	0.88			Too acid	0.68
	organic matter					
23: Leafriver-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Too acid	0.97	saturated zone		Depth to	0.00
			Low strength	0.00	saturated zone	
24B: Springlake-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Rock fragments	0.12
	Droughty	0.08			Carbonate content	0.97
	Low content of	0.12				
	organic matter					
	Too acid	0.50				
	Carbonate content	0.97				
29A: Solona-----	Fair		Poor		Poor	
	Low content of	0.12	Depth to	0.00	Depth to	0.00
	organic matter		saturated zone		saturated zone	
	Carbonate content	0.92	Low strength	0.00	Rock fragments	0.00
					Carbonate content	0.92
					Hard to reclaim	0.92
30: Kinross-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Low content of	0.12	Low strength	0.00	saturated zone	
	organic matter					
	Too acid	0.50				
	Droughty	0.99				
31B: McMillan-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of	0.12			Too acid	0.59
	organic matter					
	Too acid	0.50				
	Droughty	0.58				
	Water erosion	0.99				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
31D: McMillan-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.59
	Too acid	0.50			Slope	0.63
	Droughty	0.58				
	Water erosion	0.99				
31E: McMillan-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too sandy	0.00
	Too acid	0.50			Too acid	0.59
	Droughty	0.58				
	Water erosion	0.99				
31F: McMillan-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too sandy	0.00
	Too acid	0.50			Too acid	0.59
	Droughty	0.58				
	Water erosion	0.99				
32A: Allendale-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00		
	Too acid	0.84	Shrink-swell	0.80		
33: Pits-----	Not rated		Not rated		Not rated	
35: Histosols-----	Not rated		Poor		Poor	
			Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Content of organic matter	0.00
Aquents-----	Not rated		Not rated		Not rated	
36: Carbondale-----	Fair		Poor		Poor	
	Too acid	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Content of organic matter	0.00
Lupton-----	Good		Poor		Poor	
			Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Content of organic matter	0.00

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
36: Tawas-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.92
37: Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
Greenwood-----	Fair		Poor		Poor	
	Too acid	0.03	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Content of organic matter	0.00
					Too acid	0.32
Loxley-----	Fair		Poor		Poor	
	Too acid	0.50	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Content of organic matter	0.00
					Too acid	0.41
45D: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00			Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to cemented pan	0.00
	Too acid	0.50	Low strength	0.00	Too acid	0.68
	Low content of organic matter	0.88				
45E: Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
45E: Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	pan	0.00	saturated zone	
	pan		Depth to cemented	0.00	pan	0.00
	Too acid	0.50	Low strength	0.00	Too acid	0.68
	Low content of organic matter	0.88				
46B: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.50
	Low content of organic matter	0.12				
	Droughty	0.44				
	Too acid	0.50				
46D: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.50
	Low content of organic matter	0.12			Slope	0.63
	Droughty	0.44				
	Too acid	0.50				
46E: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.50
	Droughty	0.44				
	Too acid	0.50				
46F: Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.50
	Droughty	0.44				
	Too acid	0.50				
47B: Trenary-----	Fair		Poor		Good	
	Low content of organic matter	0.12	Low strength	0.00		
	Too acid	0.50				
47D: Trenary-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.63
	Too acid	0.50				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
53B: Menominee, sandy substratum-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.98
	Too acid	0.12				
	Carbonate content	0.92				
57B: Amadon-----	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		
	Too acid	0.50				
Longrie-----	Fair		Poor		Fair	
	Too acid	0.50	Depth to bedrock	0.00	Depth to bedrock	0.93
	Droughty	0.67	Low strength	0.00		
	Depth to bedrock	0.93				
	Water erosion	0.99				
Rock outcrop-----	Not rated		Not rated		Not rated	
57D: Amadon-----	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	0.63
	Too acid	0.50				
Longrie-----	Fair		Poor		Fair	
	Too acid	0.50	Depth to bedrock	0.00	Slope	0.63
	Droughty	0.67	Low strength	0.00	Depth to bedrock	0.93
	Depth to bedrock	0.93				
	Water erosion	0.99				
Rock outcrop-----	Not rated		Not rated		Not rated	
57E: Amadon-----	Poor		Poor		Poor	
	Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.00	Low strength	0.00	Depth to bedrock	0.00
	Too acid	0.50	Slope	0.00		
Longrie-----	Fair		Poor		Poor	
	Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
	Droughty	0.67	Low strength	0.00	Depth to bedrock	0.93
	Depth to bedrock	0.93	Slope	0.00		
	Water erosion	0.99				
Rock outcrop-----	Not rated		Not rated		Not rated	
60A: Kinross-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Low content of organic matter	0.12	Low strength	0.00	saturated zone	
	Too acid	0.50				
	Droughty	0.99				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
60A:						
Au Gres-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Low content of organic matter	0.12	Low strength	0.00	saturated zone	
	Too acid	0.50			Too acid	0.76
	Droughty	0.83				
61B:						
Paquin-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Depth to cemented	0.00	Depth to	0.53	Depth to	0.53
	pan		saturated zone		saturated zone	
	Too acid	0.50			Too acid	0.92
65B:						
Rubicon, organic surface-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.20				
65D:						
Rubicon, organic surface-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.20				
65E:						
Rubicon, organic surface-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.20				
66B:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
66B:						
Kaks-----	Fair		Poor		Fair	
	Too sandy	0.04	Low strength	0.00	Too sandy	0.04
	Low content of organic matter	0.12	Cobble content	0.93	Rock fragments	0.32
	Too acid	0.92				
66D:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
Kaks-----	Fair		Poor		Fair	
	Too sandy	0.04	Low strength	0.00	Too sandy	0.04
	Low content of organic matter	0.12	Cobble content	0.93	Rock fragments	0.32
	Too acid	0.92			Slope	0.63
66E:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
Kaks-----	Fair		Poor		Poor	
	Too sandy	0.04	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too sandy	0.04
	Too acid	0.92	Cobble content	0.93	Rock fragments	0.32
66F:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
Kaks-----	Fair		Poor		Poor	
	Too sandy	0.04	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too sandy	0.04
	Too acid	0.92	Cobble content	0.93	Rock fragments	0.32
74B:						
Menominee, sandy substratum-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.98
	Too acid	0.12				
	Carbonate content	0.92				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
74B:						
Graveraet-----	Poor		Poor		Poor	
	Droughty	0.00	Depth to	0.00	Hard to reclaim	0.00
	Depth to cemented	0.00	saturated zone		Depth to	0.00
	pan		Depth to cemented	0.00	saturated zone	
	Too acid	0.16	pan		Depth to cemented	0.00
	Carbonate content	0.92	Low strength	0.00	pan	
	Water erosion	0.99			Too acid	0.99
75D:						
Dillingham-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented	0.00	Hard to reclaim	0.00
	Droughty	0.00	pan		Depth to cemented	0.01
	Depth to cemented	0.01	Low strength	0.00	pan	
	pan				Too sandy	0.01
	Too sandy	0.01			Slope	0.63
	Too acid	0.50			Too acid	0.82
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of	0.18				
	organic matter					
	Too acid	0.50				
	Droughty	0.77				
75E:						
Dillingham-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented	0.00	Slope	0.00
	Droughty	0.00	pan		Hard to reclaim	0.00
	Depth to cemented	0.01	Low strength	0.00	Depth to cemented	0.01
	pan		Slope	0.00	pan	
	Too sandy	0.01			Too sandy	0.01
	Too acid	0.50			Too acid	0.82
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of	0.18				
	organic matter					
	Too acid	0.50				
	Droughty	0.77				
75F:						
Dillingham-----	Poor		Poor		Poor	
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Droughty	0.00	Depth to cemented	0.00	Hard to reclaim	0.00
	Depth to cemented	0.01	pan		Depth to cemented	0.01
	pan		Low strength	0.00	pan	
	Too sandy	0.01			Too sandy	0.01
	Too acid	0.50			Too acid	0.82
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of	0.18				
	organic matter					
	Too acid	0.50				
	Droughty	0.77				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
76D: Menominee, sandy substratum-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Too acid	0.12			Too acid	0.98
	Carbonate content	0.92				
Trenary-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.63
	Too acid	0.50				
76E: Menominee, sandy substratum-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Too acid	0.12			Too acid	0.98
	Carbonate content	0.92				
Trenary-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
	Too acid	0.50	Slope	0.00		
84B: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.12
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.85				
Alcona-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Too acid	0.08			Too acid	0.95
	Low content of organic matter	0.12				
84D: Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.12
	Low content of organic matter	0.12			Slope	0.63
	Too acid	0.50				
	Droughty	0.85				
Alcona-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Too acid	0.08			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.95

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
84E:						
Liminga-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.12
	Too acid	0.50				
	Droughty	0.85				
Alcona-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Too acid	0.08	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.95
85B:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
Okeefe-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.98
	Low content of organic matter	0.12				
	Too acid	0.50				
85D:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
Okeefe-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.50				
85E:						
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
85E:						
Okeefe-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.50				
88B:						
Croswell-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.72				
Au Gres-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12			Too acid	0.76
	Too acid	0.50				
	Droughty	0.83				
89A:						
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				
Finch-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Droughty	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Depth to cemented pan	0.00			Too acid	0.88
	Too acid	0.08				
90D:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
90E:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				
90F:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				
91D:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
91E:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Wind erosion	0.00	Slope	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
91F:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
93F:						
Ontonagon-----	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Slope	0.00	Slope	0.00
	Too acid	0.68	Shrink-swell	0.12		
	Water erosion	0.90				
Pickford, occasionally flooded-----	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
	Water erosion	0.90	Shrink-swell	0.12	Carbonate content	0.92
	Carbonate content	0.92				
	Too acid	0.92				
94A:						
Tawas-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.92
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				
Finch-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Droughty	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Depth to cemented pan	0.00			Too acid	0.88
	Too acid	0.08				
102:						
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Droughty	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Too acid	0.50			Too acid	0.68
	Low content of organic matter	0.88				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
102: Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
104B: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Too acid	0.88
	Too acid	0.50			Hard to reclaim	0.98
	Droughty	0.99			Rock fragments	0.98
	Water erosion	0.99				
104D: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Slope	0.63
	Too acid	0.50			Too acid	0.88
	Droughty	0.99			Hard to reclaim	0.98
	Water erosion	0.99			Rock fragments	0.98
104E: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too sandy	0.00
	Too acid	0.50			Too acid	0.88
	Droughty	0.99			Hard to reclaim	0.98
	Water erosion	0.99			Rock fragments	0.98
109D: Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
109F: Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
109F:						
Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
110D:						
Au Gres-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12			Too acid	0.76
	Too acid	0.50				
	Droughty	0.83				
Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
110E:						
Au Gres-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12			Too acid	0.76
	Too acid	0.50				
	Droughty	0.83				
Dawson-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
					Too acid	0.00
Rubicon-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Too acid	0.08				
	Low content of organic matter	0.12				
	Droughty	0.26				
116:						
Udipsamments-----	Not rated		Not rated		Not rated	
Udorthents-----	Not rated		Not rated		Not rated	

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
117D: Manistee, sandy substratum-----	Poor Too sandy Wind erosion Too acid Low content of organic matter Carbonate content	 0.00 0.00 0.08 0.12 0.92	Poor Low strength Shrink-swell	 0.00 0.64	Poor Too sandy Slope	 0.00 0.63
120B: McMillan-----	Poor Too sandy Low content of organic matter Too acid Droughty Water erosion	 0.00 0.12 0.50 0.58 0.99	Poor Low strength	 0.00	Poor Too sandy Too acid	 0.00 0.59
Trenary-----	Fair Low content of organic matter Too acid	 0.12 0.50	Poor Low strength	 0.00	Good	
120D: McMillan-----	Poor Too sandy Low content of organic matter Too acid Droughty Water erosion	 0.00 0.12 0.50 0.58 0.99	Poor Low strength	 0.00	Poor Too sandy Too acid Slope	 0.00 0.59 0.63
Trenary-----	Fair Low content of organic matter Too acid	 0.12 0.50	Poor Low strength	 0.00	Fair Slope	 0.63
120E: McMillan-----	Poor Too sandy Low content of organic matter Too acid Droughty Water erosion	 0.00 0.12 0.50 0.58 0.99	Poor Low strength Slope	 0.00 0.00	Poor Slope Too sandy Too acid	 0.00 0.00 0.59
Trenary-----	Fair Low content of organic matter Too acid	 0.12 0.50	Poor Low strength Slope	 0.00 0.00	Poor Slope	 0.00
122: Pits, quarry-----	Not rated		Not rated		Not rated	

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
126: Pickford-----	Poor		Poor		Poor	
	Too clayey	0.00	Depth to	0.00	Too clayey	0.00
	Low content of organic matter	0.12	saturated zone		Depth to	0.00
	Water erosion	0.90	Low strength	0.00	saturated zone	
	Carbonate content	0.92	Shrink-swell	0.12	Carbonate content	0.92
	Too acid	0.92				
129A: Rudyard-----	Poor		Poor		Poor	
	Too clayey	0.00	Depth to	0.00	Too clayey	0.00
	Low content of organic matter	0.12	saturated zone		Depth to	0.00
	Too acid	0.54	Low strength	0.00	saturated zone	
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.95				
130A: Rudyard-----	Poor		Poor		Poor	
	Too clayey	0.00	Depth to	0.00	Too clayey	0.00
	Low content of organic matter	0.12	saturated zone		Depth to	0.00
	Too acid	0.54	Low strength	0.00	saturated zone	
	Water erosion	0.90	Shrink-swell	0.12		
	Carbonate content	0.95				
Pickford-----	Poor		Poor		Poor	
	Too clayey	0.00	Depth to	0.00	Too clayey	0.00
	Low content of organic matter	0.12	saturated zone		Depth to	0.00
	Water erosion	0.90	Low strength	0.00	saturated zone	
	Carbonate content	0.92	Shrink-swell	0.12	Carbonate content	0.92
	Too acid	0.92				
132B: Sugar-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Depth to	0.14
	Too acid	0.54	Depth to	0.14	saturated zone	
	Carbonate content	0.92	saturated zone			
			Shrink-swell	0.89		
133: Dorval-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to	0.00	Depth to	0.00
	Low content of organic matter	0.12	saturated zone		saturated zone	
	Too acid	0.50	Low strength	0.00	Content of organic matter	0.00
			Shrink-swell	0.65	Too acid	0.76
143: Caffey-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to	0.00	Depth to	0.00
	Low content of organic matter	0.12	saturated zone		saturated zone	
	Carbonate content	0.80	Low strength	0.00	Carbonate content	0.80
	Water erosion	0.90				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
146A:						
Allendale-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Low content of	0.12	Low strength	0.00	saturated zone	
	organic matter		Shrink-swell	0.80		
	Too acid	0.84				
Fibre-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to	0.00	Too clayey	0.00
	Too clayey	0.00	saturated zone		Depth to	0.00
	Low content of	0.12	Low strength	0.00	saturated zone	
	organic matter		Shrink-swell	0.38	Carbonate content	0.97
	Too acid	0.50				
	Carbonate content	0.97				
167D:						
Battydoe-----	Fair		Poor		Poor	
	Low content of	0.12	Low strength	0.00	Rock fragments	0.00
	organic matter		Cobble content	0.99	Hard to reclaim	0.41
	Too acid	0.50			Slope	0.63
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Depth to cemented	0.00			Too acid	0.50
	pan				Slope	0.63
	Too acid	0.08				
173B:						
Paquin-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Depth to cemented	0.00	Depth to	0.53	Depth to	0.53
	pan		saturated zone		saturated zone	
	Too acid	0.50			Too acid	0.92
Finch-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Droughty	0.00	Depth to cemented	0.00	saturated zone	
	Depth to cemented	0.00	pan		Depth to cemented	0.00
	pan		Low strength	0.00	pan	
	Too acid	0.08			Too acid	0.88
174B:						
Croswell-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to	0.53	Depth to	0.53
	Low content of	0.12	saturated zone		saturated zone	
	organic matter					
	Too acid	0.50				
	Droughty	0.72				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
174B:						
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	pan		saturated zone	
	pan		Depth to cemented	0.00	pan	0.00
	Too acid	0.50	pan		Depth to cemented	0.00
	Low content of	0.88	Low strength	0.00	pan	
	organic matter				Too acid	0.68
175D:						
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	pan		pan	
	Depth to cemented	0.00	Low strength	0.00	pan	
	pan				Too acid	0.50
	Too acid	0.08			Slope	0.63
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	pan		saturated zone	
	pan		Depth to cemented	0.00	pan	0.00
	Too acid	0.50	pan		Depth to cemented	0.00
	Low content of	0.88	Low strength	0.00	pan	
	organic matter				Too acid	0.68
175E:						
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	pan		pan	
	Depth to cemented	0.00	Low strength	0.00	pan	
	pan		Slope	0.50	Slope	0.00
	Too acid	0.08			Too acid	0.50
Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	pan		saturated zone	
	pan		Depth to cemented	0.00	pan	0.00
	Too acid	0.50	pan		Depth to cemented	0.00
	Low content of	0.88	Low strength	0.00	pan	
	organic matter				Too acid	0.68
176B:						
Paquin-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	pan		pan	
	Depth to cemented	0.00	Low strength	0.00	pan	
	pan		Depth to	0.53	Depth to	0.53
	Too acid	0.50	saturated zone		saturated zone	
					Too acid	0.92

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
176B: Spot-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Droughty	0.00	saturated zone		Depth to	0.00
	Depth to cemented	0.00	pan		saturated zone	
	pan		Depth to cemented	0.00	pan	0.00
	Too acid	0.50	Low strength	0.00	Too acid	0.68
	Low content of	0.88				
	organic matter					
179B: Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Depth to cemented	0.00			Too acid	0.50
	pan					
	Too acid	0.08				
179D: Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Too sandy	0.00
	Wind erosion	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Depth to cemented	0.00			Too acid	0.50
	pan				Slope	0.63
	Too acid	0.08				
179E: Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented	0.00	Slope	0.00
	Wind erosion	0.00	pan		Too sandy	0.00
	Droughty	0.00	Low strength	0.00	Depth to cemented	0.00
	Depth to cemented	0.00	Slope	0.00	pan	
	pan				Too acid	0.50
	Too acid	0.08				
179F: Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Wind erosion	0.00	Depth to cemented	0.00	Too sandy	0.00
	Droughty	0.00	pan		Depth to cemented	0.00
	Depth to cemented	0.00	Low strength	0.00	pan	
	pan				Too acid	0.50
	Too acid	0.08				
180B: Millecoquins-----	Fair		Poor		Poor	
	Low content of	0.12	Depth to	0.00	Depth to	0.00
	organic matter		saturated zone		saturated zone	
	Too acid	0.20	Low strength	0.00	Too acid	0.76
	Water erosion	0.90				
186D: Sporley-----	Fair		Poor		Fair	
	Too acid	0.08	Low strength	0.00	Slope	0.63
	Low content of	0.12			Too acid	0.92
	organic matter					
	Water erosion	0.90				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
186E: Sporley-----	Fair		Poor		Poor	
	Too acid	0.08	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too acid	0.92
	Water erosion	0.90				
186F: Sporley-----	Fair		Poor		Poor	
	Too acid	0.08	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.92
	Water erosion	0.90				
187B: Auger-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.76
	Too acid	0.50	Depth to saturated zone	0.89	Depth to saturated zone	0.89
	Water erosion	0.99				
188: Hendrie-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00		
	Water erosion	0.99				
189A: Bodi-----	Fair		Poor		Poor	
	Too acid	0.05	Depth to cemented pan	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.10	Low strength	0.00	Depth to cemented pan	0.10
	Droughty	0.14	Depth to saturated zone	0.14	Depth to saturated zone	0.14
					Too acid	0.50
					Rock fragments	0.98
Chesbrough-----	Poor		Poor		Poor	
	Droughty	0.00	Depth to saturated zone	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Depth to cemented pan	0.00
	Water erosion	0.90			Too acid	0.59
190B: Bodi-----	Fair		Poor		Poor	
	Too acid	0.05	Depth to cemented pan	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.10	Low strength	0.00	Depth to cemented pan	0.10
	Droughty	0.14	Depth to saturated zone	0.14	Depth to saturated zone	0.14
					Too acid	0.50
					Rock fragments	0.98

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
191D:						
Widgeon-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.14
	Too acid	0.50	Depth to saturated zone	0.14	Slope	0.63
	Water erosion	0.90			Too acid	0.76
Kalkaska-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
193A:						
Annanias-----	Fair		Poor		Poor	
	Too acid	0.01	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.88
	Water erosion	0.99				
194A:						
Hendrie-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00		
	Water erosion	0.99				
Annanias-----	Fair		Poor		Poor	
	Too acid	0.01	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.88
	Water erosion	0.99				
195A:						
Chesbrough-----	Poor		Poor		Poor	
	Droughty	0.00	Depth to saturated zone	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.00	Depth to cemented pan	0.00	Depth to saturated zone	0.00
	Too acid	0.50	Low strength	0.00	Depth to cemented pan	0.00
	Water erosion	0.90			Too acid	0.59
197D:						
Zandi-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.63
	Too acid	0.50			Too sandy	0.86
	Too sandy	0.86			Too acid	0.95
197E:						
Zandi-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
	Too acid	0.50	Slope	0.00	Too sandy	0.86
	Too sandy	0.86			Too acid	0.95

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
198B: Vilas-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Droughty	0.31				
	Too acid	0.50				
198D: Vilas-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12				
	Droughty	0.31				
	Too acid	0.50				
199B: Auger-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.76
	Too acid	0.50	Depth to saturated zone	0.89	Depth to saturated zone	0.89
	Water erosion	0.99				
Annanias-----	Fair		Poor		Poor	
	Too acid	0.01	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12	Low strength	0.00	Too acid	0.88
	Water erosion	0.99				
200B: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Rock fragments	0.00
	Too acid	0.50			Hard to reclaim	0.92
	Droughty	0.80				
200D: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12			Rock fragments	0.00
	Too acid	0.50			Slope	0.63
	Droughty	0.80			Hard to reclaim	0.92
200E: Pence-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Too sandy	0.00
	Too acid	0.50			Rock fragments	0.00
	Droughty	0.80			Hard to reclaim	0.92

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
201B: Crowwell, rarely flooded-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Depth to	0.53	Depth to	0.53
	Low content of organic matter	0.12	saturated zone		saturated zone	
	Too acid	0.50				
	Droughty	0.72				
Deford, frequently flooded-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to	0.00	Too sandy	0.00
	Wind erosion	0.00	saturated zone		Depth to	0.00
	Too acid	0.99	Low strength	0.00	saturated zone	
202B: Whitewash-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Too acid	0.82
	Low content of organic matter	0.00				
	Too acid	0.50				
	Droughty	0.61				
203D: Frohling-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented	0.00	Hard to reclaim	0.00
	Depth to cemented	0.00	pan		Depth to cemented	0.00
	Droughty	0.00	Low strength	0.00	pan	
	Too acid	0.00			Too acid	0.12
					Slope	0.63
203E: Frohling-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented	0.00	Slope	0.00
	Depth to cemented	0.00	pan		Hard to reclaim	0.00
	Droughty	0.00	Low strength	0.00	Depth to cemented	0.00
	Too acid	0.00	Slope	0.00	pan	
					Too acid	0.12
204: Gogomain-----	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to	0.00	Depth to	0.00
	Too sandy	0.45	saturated zone		saturated zone	
	Carbonate content	0.92	Low strength	0.00	Too sandy	0.45
	Too acid	0.92	Shrink-swell	0.92		
	Water erosion	0.99				
205B: Kalkaska, burned----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
205D: Kalkaska, burned----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.18				
	Too acid	0.50				
	Droughty	0.77				
206B: Deerton-----	Poor		Poor		Fair	
	Wind erosion	0.00	Depth to bedrock	0.00	Too sandy	0.20
	Droughty	0.00	Low strength	0.00	Depth to bedrock	0.79
	Too sandy	0.20			Too acid	0.95
	Too acid	0.50			Rock fragments	0.98
	Depth to bedrock	0.79				
211D: Frohling-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented pan	0.00	Hard to reclaim	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Droughty	0.00			Too acid	0.12
	Too acid	0.00			Slope	0.63
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented pan	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Droughty	0.00			Too acid	0.50
	Depth to cemented pan	0.00			Slope	0.63
	Too acid	0.08				
211E: Frohling-----	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to cemented pan	0.00	Slope	0.00
	Depth to cemented pan	0.00	Low strength	0.00	Hard to reclaim	0.00
	Droughty	0.00	Slope	0.00	Depth to cemented pan	0.00
	Too acid	0.00			Too acid	0.12
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented pan	0.00	Slope	0.00
	Wind erosion	0.00	Low strength	0.00	Too sandy	0.00
	Droughty	0.00	Slope	0.00	Depth to cemented pan	0.00
	Depth to cemented pan	0.00			Too acid	0.50
	Too acid	0.08				
212: Markey-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12				
	Too acid	0.50				

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214D:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Markey-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12				
	Too acid	0.50				
214E:						
Rousseau-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too acid	0.98
	Too acid	0.54				
	Droughty	0.80				
Markey-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12				
	Too acid	0.50				
215B:						
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented pan	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Droughty	0.00			Too acid	0.50
	Depth to cemented pan	0.00				
	Too acid	0.08				
Alcona-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Too acid	0.08			Too acid	0.95
	Low content of organic matter	0.12				
215D:						
Wallace-----	Poor		Poor		Poor	
	Too sandy	0.00	Depth to cemented pan	0.00	Too sandy	0.00
	Wind erosion	0.00	Low strength	0.00	Depth to cemented pan	0.00
	Droughty	0.00			Too acid	0.50
	Depth to cemented pan	0.00			Slope	0.63
	Too acid	0.08				
Alcona-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Too acid	0.08			Slope	0.63
	Low content of organic matter	0.12			Too acid	0.95

Table 13b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
246B: Garlic-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00				
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.97				
246D: Garlic-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Wind erosion	0.00			Slope	0.63
	Low content of organic matter	0.12				
	Too acid	0.50				
	Droughty	0.97				
286B: Fence-----	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Depth to	0.14
	Too acid	0.50	Depth to	0.14	saturated zone	
	Water erosion	0.90	saturated zone			
287B: Noseum-----	Poor		Poor		Poor	
	Too sandy	0.00	Low strength	0.00	Too sandy	0.00
	Low content of organic matter	0.12	Depth to	0.53	Depth to	0.53
	Too acid	0.50	saturated zone		saturated zone	
					Too acid	0.76
300: Beaches-----	Not rated		Not rated		Not rated	
W: Water-----	Not rated		Not rated		Not rated	

Table 14a.--Water 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	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
10D: Ontonagon-----	Somewhat limited Slope	0.01	Very limited Hard to pack	1.00	Very limited Depth to water	1.00
15B: Liminga-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
15D: Liminga-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
15E: Liminga-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
15F: Liminga-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
16B: Graveraet-----	Very limited Depth to cemented pan Seepage	1.00 0.70	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 0.03	Very limited Depth to water	1.00
17C: Deer Park-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
17E: Deer Park-----	Very limited Seepage Slope	1.00 0.06	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
17F: Deer Park-----	Very limited Seepage Slope	1.00 0.92	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
18B: Rubicon-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
18D: Rubicon-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
18E: Rubicon-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
18F: Rubicon-----	Very limited Seepage Slope	1.00 0.99	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
19B: Kalkaska-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
19D: Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
19E: Kalkaska-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
19F: Kalkaska-----	Very limited Seepage Slope	1.00 0.99	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
20B: Crowell-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave Depth to water	1.00 0.01
21A: Finch-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 0.91	Very limited Cutbanks cave	1.00
22: Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
23: Leafriver-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.36	Very limited Cutbanks cave	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
24B: Springlake-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.66	Very limited Depth to water	1.00
29A: Solona-----	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone	1.00	Very limited Cutbanks cave Slow refill	1.00 0.19
30: Kinross-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.95	Very limited Cutbanks cave	1.00
31B: McMillan-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
31D: McMillan-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
31E: McMillan-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
31F: McMillan-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
32A: Allendale-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage Piping	1.00 0.36 0.06	Very limited Depth to water	1.00
33: Pits-----	Not rated		Not rated		Not rated	
35: Histosols-----	Very limited Seepage	1.00	Very limited Content of organic matter Ponding Depth to saturated zone Piping	1.00 1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
Aquents-----	Not limited		Very limited Ponding	1.00	Somewhat limited Cutbanks cave	0.10

Table 14a.--Water Management--Continued

Map symbol and soil name	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
36:						
Carbondale-----	Very limited Seepage	1.00	Very limited Content of organic matter Depth to saturated zone Piping Ponding	1.00 1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
Lupton-----	Very limited Seepage	1.00	Very limited Content of organic matter Depth to saturated zone Piping Ponding	1.00 1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
Tawas-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 1.00 0.91	Very limited Cutbanks cave	1.00
37:						
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
Greenwood-----	Very limited Seepage	1.00	Very limited Content of organic matter Depth to saturated zone Piping Ponding	1.00 1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
Loxley-----	Very limited Seepage	1.00	Very limited Content of organic matter Depth to saturated zone Piping Ponding	1.00 1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
45D:						
Rubicon-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
45E: Rubicon-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
46B: Kalkaska-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
46D: Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
46E: Kalkaska-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
46F: Kalkaska-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
47B: Trenary-----	Somewhat limited Seepage	0.30	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
47D: Trenary-----	Somewhat limited Seepage Slope	0.30 0.01	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
53B: Menominee, sandy substratum-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
57B: Amadon-----	Very limited Depth to bedrock	1.00	Very limited Thin layer Piping Seepage	1.00 1.00 0.01	Very limited Depth to water	1.00
Longrie-----	Somewhat limited Seepage Depth to bedrock	0.70 0.66	Somewhat limited Thin layer Seepage	0.66 0.01	Very limited Depth to water	1.00
Rock outcrop-----	Not rated		Not rated		Not rated	

Table 14a.--Water Management--Continued

Map symbol and soil name	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
57D:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
	Slope	0.01	Piping	1.00		
			Seepage	0.01		
Longrie-----	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.70	Thin layer	0.66	Depth to water	1.00
	Depth to bedrock	0.66	Seepage	0.01		
	Slope	0.01				
Rock outcrop-----	Not rated		Not rated		Not rated	
57E:						
Amadon-----	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
	Slope	0.28	Piping	1.00		
			Seepage	0.01		
Longrie-----	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.70	Thin layer	0.66	Depth to water	1.00
	Depth to bedrock	0.66	Seepage	0.01		
	Slope	0.28				
Rock outcrop-----	Not rated		Not rated		Not rated	
60A:						
Kinross-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to	1.00	Cutbanks cave	1.00
			saturated zone	1.00		
			Ponding	1.00		
			Seepage	0.95		
Au Gres-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to	1.00	Cutbanks cave	1.00
			saturated zone	1.00		
			Seepage	0.64		
61B:						
Paquin-----	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	Cutbanks cave	1.00
	Depth to cemented	1.00	Depth to	1.00	Depth to water	0.01
	pan		saturated zone	1.00		
			Seepage	0.95		
65B:						
Rubicon, organic surface-----	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.82	Depth to water	1.00
65D:						
Rubicon, organic surface-----	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.82	Depth to water	1.00
	Slope	0.01				
65E:						
Rubicon, organic surface-----	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.82	Depth to water	1.00
	Slope	0.28				

Table 14a.--Water Management--Continued

Map symbol and soil name	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
66B:						
Kalkaska-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Kaks-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
66D:						
Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Kaks-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
66E:						
Kalkaska-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Kaks-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
66F:						
Kalkaska-----	Very limited Seepage Slope	1.00 0.99	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Kaks-----	Very limited Seepage Slope	1.00 0.99	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
74B:						
Menominee, sandy substratum-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Graveraet-----	Very limited Depth to cemented pan Seepage	1.00 0.70	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 0.03	Very limited Depth to water	1.00
75D:						
Dillingham-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.68	Very limited Depth to water	1.00
Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
75E:						
Dillingham-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.28	Very limited Thin layer Seepage	1.00 0.68	Very limited Depth to water	1.00
Kalkaska-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
75F:						
Dillingham-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.97	Very limited Thin layer Seepage	1.00 0.68	Very limited Depth to water	1.00
Kalkaska-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
76D:						
Menominee, sandy substratum-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Trenary-----	Somewhat limited Seepage Slope	0.30 0.01	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
76E:						
Menominee, sandy substratum-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Trenary-----	Somewhat limited Seepage Slope	0.30 0.28	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
84B:						
Liminga-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
Alcona-----	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00
84D:						
Liminga-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
Alcona-----	Somewhat limited Seepage Slope	0.70 0.01	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
84E:						
Liminga-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.45	Very limited Depth to water	1.00
Alcona-----	Somewhat limited Seepage Slope	0.70 0.28	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00
85B:						
Kalkaska-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Okeefe-----	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.23	Very limited Depth to water	1.00
85D:						
Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Okeefe-----	Very limited Seepage Slope	1.00 0.01	Very limited Piping Seepage	1.00 0.23	Very limited Depth to water	1.00
85E:						
Kalkaska-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Okeefe-----	Very limited Seepage Slope	1.00 0.28	Very limited Piping Seepage	1.00 0.23	Very limited Depth to water	1.00
88B:						
Croswell-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave Depth to water	1.00 0.01
Au Gres-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave	1.00
89A:						
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
Finch-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 0.91	Very limited Cutbanks cave	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
90D:						
Rousseau-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
90E:						
Rousseau-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
90F:						
Rousseau-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
91D:						
Rousseau-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
91E:						
Rousseau-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
91F:						
Rousseau-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
93F:						
Ontonagon-----	Somewhat limited Slope	0.88	Very limited Hard to pack	1.00	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
93F: Pickford, occasionally flooded-----	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.49	Very limited Depth to water	1.00
94A: Tawas-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.91	Very limited Cutbanks cave	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
Finch-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 1.00 0.91	Very limited Cutbanks cave	1.00
102: Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
104B: Pence-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
104D: Pence-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
104E: Pence-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
109D:						
Rousseau-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
109F:						
Rousseau-----	Very limited Seepage Slope	1.00 0.97	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
110D:						
Au Gres-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave	1.00
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
Rubicon-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
110E:						
Au Gres-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave	1.00
Dawson-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.25	Very limited Cutbanks cave	1.00
Rubicon-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
116: Udipsamments-----	Not rated		Not rated		Not rated	
Udorthents-----	Not rated		Not rated		Not rated	
117D: Manistee, sandy substratum-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.09	Very limited Depth to water	1.00
120B: McMillan-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
Trenary-----	Somewhat limited Seepage	0.30	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
120D: McMillan-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
Trenary-----	Somewhat limited Seepage Slope	0.30 0.01	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
120E: McMillan-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.58	Very limited Depth to water	1.00
Trenary-----	Somewhat limited Seepage Slope	0.30 0.28	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
122: Pits, quarry-----	Not rated		Not rated		Not rated	
126: Pickford-----	Not limited		Very limited Depth to saturated zone Ponding Hard to pack	1.00 1.00 0.49	Very limited Depth to water	1.00
129A: Rudyard-----	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Depth to water	1.00
130A: Rudyard-----	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
130A: Pickford-----	Not limited		Very limited Depth to saturated zone Ponding Hard to pack	1.00 1.00 0.49	Very limited Depth to water	1.00
132B: Sugar-----	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone	1.00	Very limited Depth to water	1.00
133: Dorval-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Cutbanks cave	0.10
143: Caffey-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.03	Very limited Cutbanks cave	1.00
146A: Allendale-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage Piping	1.00 0.36 0.06	Very limited Depth to water	1.00
Fibre-----	Not limited		Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.82	Very limited Depth to water	1.00
167D: Battydoe-----	Somewhat limited Seepage Slope	0.70 0.01	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00
Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
173B: Paquin-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Thin layer Depth to saturated zone Seepage	1.00 1.00 0.95	Very limited Cutbanks cave Depth to water	1.00 0.01

Table 14a.--Water Management--Continued

Map symbol and soil name	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
173B: Finch-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Seepage	1.00 1.00 0.91	Very limited Cutbanks cave	1.00
174B: Crowell-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave Depth to water	1.00 0.01
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
175D: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
175E: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.12	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
176B: Paquin-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Thin layer Depth to saturated zone Seepage	1.00 1.00 0.95	Very limited Cutbanks cave Depth to water	1.00 0.01

Table 14a.--Water Management--Continued

Map symbol and soil name	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
176B: Spot-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Depth to saturated zone Thin layer Content of organic matter Ponding Seepage	1.00 1.00 1.00 1.00 0.64	Very limited Cutbanks cave	1.00
179B: Wallace-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
179D: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
179E: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.28	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
179F: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.97	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
180B: Millecoquins-----	Somewhat limited Seepage	0.03	Very limited Depth to saturated zone Piping	1.00 0.98	Very limited Depth to water	1.00
186D: Sporley-----	Somewhat limited Seepage Slope	0.05 0.01	Very limited Piping	1.00	Very limited Depth to water	1.00
186E: Sporley-----	Somewhat limited Slope Seepage	0.28 0.05	Very limited Piping	1.00	Very limited Depth to water	1.00
186F: Sporley-----	Somewhat limited Slope Seepage	0.97 0.05	Very limited Piping	1.00	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
187B: Auger-----	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 0.86	Somewhat limited Cutbanks cave Slow refill Depth to water	0.50 0.30 0.06
188: Hendrie-----	Somewhat limited Seepage	0.81	Very limited Depth to saturated zone Piping Ponding	1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
189A: Bodi-----	Very limited Seepage Depth to cemented pan	1.00 0.98	Very limited Depth to saturated zone Piping Thin layer Seepage	1.00 1.00 0.98 0.09	Very limited Depth to water	1.00
Chesbrough-----	Very limited Depth to cemented pan Seepage	1.00 0.70	Very limited Depth to saturated zone Thin layer Piping Seepage	1.00 1.00 1.00 0.02	Very limited Depth to water Slow refill	1.00 0.30
190B: Bodi-----	Very limited Seepage Depth to cemented pan	1.00 0.98	Very limited Depth to saturated zone Piping Thin layer Seepage	1.00 1.00 0.98 0.09	Very limited Depth to water	1.00
191D: Widgeon-----	Somewhat limited Seepage Slope	0.03 0.01	Very limited Depth to saturated zone Piping	1.00 1.00	Very limited Depth to water	1.00
Kalkaska-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
193A: Annaias-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Somewhat limited Cutbanks cave	0.50
194A: Hendrie-----	Somewhat limited Seepage	0.81	Very limited Depth to saturated zone Piping Ponding	1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10

Table 14a.--Water Management--Continued

Map symbol and soil name	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
194A: Annanias-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Somewhat limited Cutbanks cave	0.50
195A: Chesbrough-----	Very limited Depth to cemented pan Seepage	1.00 0.70	Very limited Depth to saturated zone Thin layer Piping Seepage	1.00 1.00 1.00 0.02	Very limited Depth to water Slow refill	1.00 0.30
197D: Zandi-----	Somewhat limited Seepage Slope	0.70 0.01	Very limited Piping Seepage	1.00 0.11	Very limited Depth to water	1.00
197E: Zandi-----	Somewhat limited Seepage Slope	0.70 0.28	Very limited Piping Seepage	1.00 0.11	Very limited Depth to water	1.00
198B: Vilas-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.95	Very limited Depth to water	1.00
198D: Vilas-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.95	Very limited Depth to water	1.00
199B: Auger-----	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 0.86	Somewhat limited Cutbanks cave Slow refill Depth to water	0.50 0.30 0.06
Annanias-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Somewhat limited Cutbanks cave	0.50
200B: Pence-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
200D: Pence-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
200E: Pence-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
201B: Crowell, rarely flooded-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.64	Very limited Cutbanks cave Depth to water	1.00 0.01
Deford, frequently flooded-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Cutbanks cave	1.00
202B: Whitewash-----	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
203D: Frohling-----	Very limited Depth to cemented pan Seepage Slope	1.00 0.70 0.01	Very limited Thin layer Seepage	1.00 0.02	Very limited Depth to water	1.00
203E: Frohling-----	Very limited Depth to cemented pan Seepage Slope	1.00 0.70 0.28	Very limited Thin layer Seepage	1.00 0.02	Very limited Depth to water	1.00
204: Gogomain-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to water	1.00
205B: Kalkaska, burned---	Very limited Seepage	1.00	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
205D: Kalkaska, burned---	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
206B: Deerton-----	Very limited Seepage Depth to bedrock	1.00 0.06	Somewhat limited Seepage Thin layer	0.86 0.77	Very limited Depth to water	1.00
211D: Frohling-----	Very limited Depth to cemented pan Seepage Slope	1.00 0.70 0.01	Very limited Thin layer Seepage	1.00 0.02	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
211D: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
211E: Frohling-----	Very limited Depth to cemented pan Seepage Slope	1.00 0.70 0.28	Very limited Thin layer Seepage	1.00 0.02	Very limited Depth to water	1.00
Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.28	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
212: Markey-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.86	Very limited Cutbanks cave	1.00
214D: Rousseau-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Markey-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.86	Very limited Cutbanks cave	1.00
214E: Rousseau-----	Very limited Seepage Slope	1.00 0.28	Somewhat limited Seepage	0.64	Very limited Depth to water	1.00
Markey-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.86	Very limited Cutbanks cave	1.00
215B: Wallace-----	Very limited Seepage Depth to cemented pan	1.00 1.00	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
Alcona-----	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00

Table 14a.--Water Management--Continued

Map symbol and soil name	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
215D: Wallace-----	Very limited Seepage Depth to cemented pan Slope	1.00 1.00 0.01	Very limited Thin layer Seepage	1.00 0.93	Very limited Depth to water	1.00
Alcona-----	Somewhat limited Seepage Slope	0.70 0.01	Somewhat limited Seepage	0.07	Very limited Depth to water	1.00
246B: Garlic-----	Very limited Seepage	1.00	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
246D: Garlic-----	Very limited Seepage Slope	1.00 0.01	Somewhat limited Seepage	0.91	Very limited Depth to water	1.00
286B: Fence-----	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Piping	1.00 1.00	Very limited Depth to water	1.00
287B: Noseum-----	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.91	Very limited Cutbanks cave Depth to water	1.00 0.01
300: Beaches-----	Not rated		Not rated		Not rated	
W: Water-----	Not rated		Not rated		Not rated	

Table 14b.--Water 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	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
10D: Ontonagon-----	Very limited		Very limited	
	Water erosion	1.00	Too clayey	1.00
	Restricted permeability	1.00	Deep to water	1.00
	Slope	1.00	Cutbanks cave	1.00
			Slope	0.37
15B: Liminga-----	Somewhat limited		Very limited	
	Droughty	0.75	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
15D: Liminga-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.75	Deep to water	1.00
			Slope	0.37
15E: Liminga-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.75	Cutbanks cave	1.00
			Deep to water	1.00
15F: Liminga-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.75	Cutbanks cave	1.00
			Deep to water	1.00
16B: Graveraet-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Cutbanks cave	1.00
	Droughty	0.80	Dense layer	0.50
	Water erosion	0.17		
17C: Deer Park-----	Somewhat limited		Very limited	
	Droughty	0.85	Cutbanks cave	1.00
	Slope	0.62	Deep to water	1.00
17E: Deer Park-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.85	Deep to water	1.00
			Slope	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
17F: Deer Park-----	Very limited Slope Droughty	1.00 0.85	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
18B: Rubicon-----	Somewhat limited Droughty Slope	0.91 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
18D: Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
18E: Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
18F: Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
19B: Kalkaska-----	Somewhat limited Droughty Slope	0.87 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
19D: Kalkaska-----	Very limited Slope Droughty	1.00 0.87	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
19E: Kalkaska-----	Very limited Slope Droughty	1.00 0.87	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
19F: Kalkaska-----	Very limited Slope Droughty	1.00 0.87	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
20B: Croswell-----	Somewhat limited Droughty Depth to saturated zone Slope	0.92 0.86 0.04	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00 1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
21A: Finch-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
	Slope	0.04	Cutbanks cave	1.00
22: Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Ponding	1.00
23: Leafriver-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
24B: Springlake-----	Somewhat limited		Very limited	
	Droughty	0.94	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
29A: Solona-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.01	Cutbanks cave	1.00
	Water erosion	0.01		
30: Kinross-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.04	Cutbanks cave	1.00
			Ponding	1.00
31B: McMillan-----	Very limited		Very limited	
	Water erosion	1.00	Cutbanks cave	1.00
	Droughty	0.20	Deep to water	1.00
	Slope	0.16		
31D: McMillan-----	Very limited		Very limited	
	Water erosion	1.00	Cutbanks cave	1.00
	Slope	1.00	Deep to water	1.00
	Droughty	0.20	Slope	0.37
31E: McMillan-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	1.00	Cutbanks cave	1.00
	Droughty	0.20	Deep to water	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
31F:				
McMillan-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	1.00	Cutbanks cave	1.00
	Droughty	0.20	Deep to water	1.00
32A:				
Allendale-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
	Droughty	0.13	Too clayey	0.50
	Slope	0.04		
33:				
Pits-----	Not rated		Not rated	
35:				
Histosols-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00
			Depth to saturated zone	1.00
			Content of organic matter	1.00
			Frost action	1.00
Aguents-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00
			Depth to saturated zone	1.00
			Frost action	1.00
36:				
Carbondale-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Content of organic matter	1.00
			Frost action	1.00
			Ponding	1.00
			Cutbanks cave	1.00
Lupton-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Content of organic matter	1.00
			Frost action	1.00
			Ponding	1.00
			Cutbanks cave	1.00
Tawas-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
37:				
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
Greenwood-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Content of organic matter Frost action Ponding Cutbanks cave	1.00 1.00 1.00 1.00 1.00
Loxley-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Content of organic matter Frost action Ponding Cutbanks cave	1.00 1.00 1.00 1.00 1.00
45D:				
Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
Spot-----	Very limited Depth to saturated zone Droughty	1.00 1.00	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00 1.00
45E:				
Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 1.00
Spot-----	Very limited Depth to saturated zone Droughty	1.00 1.00	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00 1.00
46B:				
Kalkaska-----	Somewhat limited Droughty Slope	0.72 0.04	Very limited Cutbanks cave Deep to water	1.00 1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
46D: Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.72	Deep to water	1.00
			Slope	0.37
46E: Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.72	Cutbanks cave	1.00
			Deep to water	1.00
46F: Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.72	Cutbanks cave	1.00
			Deep to water	1.00
47B: Trenary-----	Somewhat limited		Very limited	
	Slope	0.36	Deep to water	1.00
	Water erosion	0.01	Cutbanks cave	1.00
47D: Trenary-----	Very limited		Very limited	
	Slope	1.00	Deep to water	1.00
	Water erosion	0.01	Cutbanks cave	1.00
			Slope	0.37
53B: Menominee, sandy substratum-----	Somewhat limited		Very limited	
	Droughty	0.42	Cutbanks cave	1.00
	Slope	0.36	Deep to water	1.00
57B: Amadon-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Droughty	1.00	Deep to water	1.00
	Slope	0.36	Cutbanks cave	1.00
	Water erosion	0.01		
Longrie-----	Very limited		Very limited	
	Water erosion	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Deep to water	1.00
	Slope	0.36	Cutbanks cave	1.00
Rock outcrop-----	Not rated		Not rated	
57D: Amadon-----	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00
	Droughty	1.00	Deep to water	1.00
	Slope	1.00	Cutbanks cave	1.00
	Water erosion	0.01	Slope	0.37
Longrie-----	Very limited		Very limited	
	Water erosion	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Deep to water	1.00
	Slope	1.00	Cutbanks cave	1.00
			Slope	0.37

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
57D: Rock outcrop-----	Not rated		Not rated	
57E: Amadon-----	Very limited		Very limited	
	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Slope	1.00
	Droughty	1.00	Deep to water	1.00
	Water erosion	0.01	Cutbanks cave	1.00
Longrie-----	Very limited		Very limited	
	Slope	1.00	Depth to bedrock	1.00
	Water erosion	1.00	Slope	1.00
	Depth to bedrock	1.00	Deep to water	1.00
			Cutbanks cave	1.00
Rock outcrop-----	Not rated		Not rated	
60A: Kinross-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.04	Cutbanks cave	1.00
			Ponding	1.00
Au Gres-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.80	Cutbanks cave	1.00
61B: Paquin-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00
	Slope	0.16	Cutbanks cave	1.00
65B: Rubicon, organic surface-----	Somewhat limited		Very limited	
	Droughty	0.96	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
65D: Rubicon, organic surface-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.96	Deep to water	1.00
			Slope	0.37
65E: Rubicon, organic surface-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.96	Cutbanks cave	1.00
			Deep to water	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
66B:				
Kalkaska-----	Somewhat limited		Very limited	
	Droughty	0.87	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
Kaks-----	Slightly limited		Very limited	
	Water erosion	0.17	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
	Cobble content	0.07		
66D:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.87	Deep to water	1.00
			Slope	0.37
Kaks-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Water erosion	0.17	Deep to water	1.00
	Cobble content	0.07	Slope	0.37
66E:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.87	Cutbanks cave	1.00
			Deep to water	1.00
Kaks-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	0.17	Cutbanks cave	1.00
	Cobble content	0.07	Deep to water	1.00
66F:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.87	Cutbanks cave	1.00
			Deep to water	1.00
Kaks-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	0.17	Cutbanks cave	1.00
	Cobble content	0.07	Deep to water	1.00
74B:				
Menominee, sandy substratum-----	Somewhat limited		Very limited	
	Droughty	0.42	Cutbanks cave	1.00
	Slope	0.36	Deep to water	1.00
Graveraet-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Depth to cemented pan	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Cutbanks cave	1.00
	Droughty	0.80	Dense layer	0.50
	Water erosion	0.17		

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
75D:				
Dillingham-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Depth to cemented pan	0.99	Deep to water	1.00
	Droughty	0.98	Depth to thin cemented pan	0.99
			Dense layer	0.50
			Slope	0.37
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.87	Deep to water	1.00
			Slope	0.37
75E:				
Dillingham-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to cemented pan	0.99	Cutbanks cave	1.00
	Droughty	0.98	Deep to water	1.00
			Depth to thin cemented pan	0.99
			Dense layer	0.50
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.87	Cutbanks cave	1.00
			Deep to water	1.00
75F:				
Dillingham-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Depth to cemented pan	0.99	Cutbanks cave	1.00
	Droughty	0.98	Deep to water	1.00
			Depth to thin cemented pan	0.99
			Dense layer	0.50
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.87	Cutbanks cave	1.00
			Deep to water	1.00
76D:				
Menominee, sandy substratum-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.42	Deep to water	1.00
			Slope	0.37
Trenary-----	Very limited		Very limited	
	Slope	1.00	Deep to water	1.00
	Water erosion	0.01	Cutbanks cave	1.00
			Slope	0.37
76E:				
Menominee, sandy substratum-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.42	Cutbanks cave	1.00
			Deep to water	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
76E:				
Trenary-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	0.01	Deep to water	1.00
			Cutbanks cave	1.00
84B:				
Liminga-----	Somewhat limited		Very limited	
	Droughty	0.75	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
Alcona-----	Slightly limited		Very limited	
	Water erosion	0.17	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
84D:				
Liminga-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.75	Deep to water	1.00
			Slope	0.37
Alcona-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Water erosion	0.17	Deep to water	1.00
			Slope	0.37
84E:				
Liminga-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.75	Cutbanks cave	1.00
			Deep to water	1.00
Alcona-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	0.17	Cutbanks cave	1.00
			Deep to water	1.00
85B:				
Kalkaska-----	Somewhat limited		Very limited	
	Droughty	0.87	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
Okeefe-----	Somewhat limited		Very limited	
	Droughty	0.33	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
85D:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.87	Deep to water	1.00
			Slope	0.37
Okeefe-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.33	Deep to water	1.00
			Slope	0.37

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
85E:				
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.87	Cutbanks cave	1.00
			Deep to water	1.00
Okeefe-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.33	Cutbanks cave	1.00
			Deep to water	1.00
88B:				
Croswell-----	Somewhat limited		Very limited	
	Droughty	0.92	Depth to	1.00
	Depth to	0.86	saturated zone	
	saturated zone		Cutbanks cave	1.00
	Slope	0.04		
Au Gres-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Droughty	0.80	Cutbanks cave	1.00
89A:				
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to thin	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
			saturated zone	
			Cutbanks cave	1.00
			Ponding	1.00
Finch-----	Very limited		Very limited	
	Depth to	1.00	Depth to thick	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
	Slope	0.04	saturated zone	
			Cutbanks cave	1.00
90D:				
Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to thin	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
			saturated zone	
			Cutbanks cave	1.00
			Ponding	1.00
90E:				
Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
90E: Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Ponding	1.00
90F: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Ponding	1.00
91D: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	0.37
91E: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.84	Cutbanks cave	1.00
			Deep to water	1.00
91F: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.84	Cutbanks cave	1.00
			Deep to water	1.00
93F: Ontonagon-----	Very limited		Very limited	
	Water erosion	1.00	Too clayey	1.00
	Restricted permeability	1.00	Deep to water	1.00
	Slope	1.00	Slope	1.00
			Cutbanks cave	1.00
Pickford, occasionally flooded-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
			Flooding	0.60
			Too clayey	0.50

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
94A:				
Tawas-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
Spot-----	Very limited Depth to saturated zone Droughty	1.00 1.00	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00
Finch-----	Very limited Depth to saturated zone Droughty Slope	1.00 1.00 0.04	Very limited Depth to thick cemented pan Depth to saturated zone Cutbanks cave	1.00 1.00 1.00
102:				
Spot-----	Very limited Depth to saturated zone Droughty	1.00 1.00	Very limited Depth to thin cemented pan Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00 1.00
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
104B:				
Pence-----	Very limited Water erosion Slope	1.00 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
104D:				
Pence-----	Very limited Water erosion Slope	1.00 1.00	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
104E:				
Pence-----	Very limited Slope Water erosion	1.00 1.00	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
109D:				
Rousseau-----	Very limited Slope	1.00	Very limited Cutbanks cave	1.00
	Droughty	0.84	Deep to water Slope	1.00 0.37
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00
109F:				
Rousseau-----	Very limited Slope	1.00	Very limited Cutbanks cave	1.00
	Droughty	0.84	Deep to water Slope	1.00 1.00
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00
110D:				
Au Gres-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Droughty	0.80	Cutbanks cave	1.00
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00
Rubicon-----	Very limited Slope	1.00	Very limited Cutbanks cave	1.00
	Droughty	0.91	Deep to water Slope	1.00 0.37
110E:				
Au Gres-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
	Droughty	0.80	Cutbanks cave	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
110E:				
Dawson-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
Rubicon-----	Very limited Slope Droughty	1.00 0.91	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 1.00
116:				
Udipsamments-----	Not rated		Not rated	
Udorthents-----	Not rated		Not rated	
117D:				
Manistee, sandy substratum-----	Very limited Restricted permeability Slope Droughty	1.00 1.00 0.14	Very limited Cutbanks cave Deep to water Too clayey Slope	1.00 1.00 0.50 0.37
120B:				
McMillan-----	Very limited Water erosion Droughty Slope	1.00 0.20 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
Trenary-----	Somewhat limited Slope Water erosion	0.36 0.01	Very limited Deep to water Cutbanks cave	1.00 1.00
120D:				
McMillan-----	Very limited Water erosion Slope Droughty	1.00 1.00 0.20	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
Trenary-----	Very limited Slope Water erosion	1.00 0.01	Very limited Deep to water Cutbanks cave Slope	1.00 1.00 0.37
120E:				
McMillan-----	Very limited Slope Water erosion Droughty	1.00 1.00 0.20	Very limited Slope Cutbanks cave Deep to water	1.00 1.00 1.00
Trenary-----	Very limited Slope Water erosion	1.00 0.01	Very limited Slope Deep to water Cutbanks cave	1.00 1.00 1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
122: Pits, quarry-----	Not rated		Not rated	
126: Pickford-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
			Ponding	1.00
			Too clayey	0.50
129A: Rudyard-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Too clayey	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
130A: Rudyard-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Too clayey	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
Pickford-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
			Ponding	1.00
			Too clayey	0.50
132B: Sugar-----	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Cutbanks cave	1.00
	Water erosion	0.89	Frost action	1.00
	Slope	0.16	Too clayey	1.00
133: Dorval-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Frost action	1.00
	Water erosion	0.89	Cutbanks cave	1.00
			Ponding	1.00
			Content of organic matter	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
143:				
Caffey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Cutbanks cave	1.00
	Restricted permeability	0.26	Ponding	1.00
Finch-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
	Slope	0.04	Cutbanks cave	1.00
146A:				
Allendale-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Cutbanks cave	1.00
	Droughty	0.13	Too clayey	0.50
	Slope	0.04		
Fibre-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Too clayey	1.00
	Water erosion	0.56	Cutbanks cave	1.00
			Ponding	1.00
167D:				
Battydoe-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Water erosion	0.17	Deep to water	1.00
	Cobble content	0.01	Slope	0.37
Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Cutbanks cave	1.00
			Deep to water	1.00
			Slope	0.37
173B:				
Paquin-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00
	Slope	0.16	Cutbanks cave	1.00
Finch-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thick cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
	Slope	0.04	Cutbanks cave	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
174B:				
Croswell-----	Somewhat limited		Very limited	
	Droughty	0.92	Depth to	1.00
	Depth to	0.86	saturated zone	
	saturated zone		Cutbanks cave	1.00
	Slope	0.04		
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to thin	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
			saturated zone	
			Cutbanks cave	1.00
			Ponding	1.00
175D:				
Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin	1.00
	Slope	1.00	cemented pan	
			Cutbanks cave	1.00
			Deep to water	1.00
			Slope	0.37
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to thin	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
			saturated zone	
			Cutbanks cave	1.00
			Ponding	1.00
175E:				
Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin	1.00
	Slope	1.00	cemented pan	
			Cutbanks cave	1.00
			Deep to water	1.00
			Slope	1.00
Spot-----	Very limited		Very limited	
	Depth to	1.00	Depth to thin	1.00
	saturated zone		cemented pan	
	Droughty	1.00	Depth to	1.00
			saturated zone	
			Cutbanks cave	1.00
			Ponding	1.00
176B:				
Paquin-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin	1.00
	Depth to	0.86	cemented pan	
	saturated zone		Depth to	1.00
	Slope	0.16	saturated zone	
			Cutbanks cave	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
176B: Spot-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Ponding	1.00
179B: Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Slope	0.16	Cutbanks cave	1.00
			Deep to water	1.00
179D: Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Cutbanks cave	1.00
			Deep to water	1.00
			Slope	0.37
179E: Wallace-----	Very limited		Very limited	
	Slope	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Slope	1.00
			Cutbanks cave	1.00
			Deep to water	1.00
179F: Wallace-----	Very limited		Very limited	
	Slope	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Slope	1.00
			Cutbanks cave	1.00
			Deep to water	1.00
180B: Millecoquins-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.26	Cutbanks cave	1.00
	Slope	0.16		
186D: Sporley-----	Very limited		Very limited	
	Water erosion	1.00	Frost action	1.00
	Slope	1.00	Deep to water	1.00
	Restricted permeability	0.60	Cutbanks cave	1.00
			Slope	0.37

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
186E: Sporley-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.60	Deep to water	1.00
			Cutbanks cave	1.00
186F: Sporley-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.60	Deep to water	1.00
			Cutbanks cave	1.00
187B: Auger-----	Very limited		Very limited	
	Water erosion	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.47	Depth to saturated zone	1.00
	Slope	0.16		
188: Hendrie-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
			Cutbanks cave	1.00
			Ponding	1.00
189A: Bodi-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to thick cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	0.56	Cutbanks cave	1.00
	Slope	0.16	Dense layer	0.50
Chesbrough-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to thin cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Cutbanks cave	1.00
	Droughty	0.94	Frost action	1.00
	Slope	0.01	Dense layer	0.50
190B: Bodi-----	Very limited		Very limited	
	Depth to cemented pan	1.00	Depth to thick cemented pan	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	0.56	Cutbanks cave	1.00
	Slope	0.16	Dense layer	0.50

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
191D:				
Widgeon-----	Very limited		Very limited	
	Water erosion	1.00	Depth to	1.00
	Slope	1.00	saturated zone	
	Depth to	1.00	Frost action	1.00
	saturated zone		Cutbanks cave	1.00
	Restricted	0.26	Slope	0.37
	permeability			
Kalkaska-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.87	Deep to water	1.00
			Slope	0.37
193A:				
Annanias-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Water erosion	1.00	Frost action	1.00
	Droughty	1.00	Cutbanks cave	1.00
	Slope	0.04		
194A:				
Hendrie-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Water erosion	1.00	Frost action	1.00
			Cutbanks cave	1.00
			Ponding	1.00
Annanias-----	Very limited		Very limited	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Water erosion	1.00	Frost action	1.00
	Droughty	1.00	Cutbanks cave	1.00
	Slope	0.04		
195A:				
Chesbrough-----	Very limited		Very limited	
	Depth to cemented	1.00	Depth to thin	1.00
	pan		cemented pan	
	Depth to	1.00	Depth to	1.00
	saturated zone		saturated zone	
	Water erosion	1.00	Cutbanks cave	1.00
	Droughty	0.94	Frost action	1.00
	Slope	0.01	Dense layer	0.50
197D:				
Zandi-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Water erosion	0.01	Deep to water	1.00
			Slope	0.37
197E:				
Zandi-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Water erosion	0.01	Cutbanks cave	1.00
			Deep to water	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
198B: Vilas-----	Somewhat limited		Very limited	
	Droughty	0.86	Cutbanks cave	1.00
	Slope	0.16	Deep to water	1.00
198D: Vilas-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.86	Deep to water	1.00
			Slope	0.37
199B: Auger-----	Very limited		Very limited	
	Water erosion	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.47	Depth to saturated zone	1.00
	Slope	0.16		
Annanias-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Water erosion	1.00	Frost action	1.00
	Droughty	1.00	Cutbanks cave	1.00
	Slope	0.04		
200B: Pence-----	Slightly limited		Very limited	
	Droughty	0.19	Cutbanks cave	1.00
	Water erosion	0.17	Deep to water	1.00
	Slope	0.16		
200D: Pence-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.19	Deep to water	1.00
	Water erosion	0.17	Slope	0.37
200E: Pence-----	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Droughty	0.19	Cutbanks cave	1.00
	Water erosion	0.17	Deep to water	1.00
201B: Croswell, rarely flooded-----	Somewhat limited		Very limited	
	Droughty	0.92	Depth to	1.00
	Depth to saturated zone	0.86	saturated zone	
			Cutbanks cave	1.00
	Slope	0.16		
Deford, frequently flooded-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Flooding	1.00
			Depth to saturated zone	1.00
			Cutbanks cave	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
202B: Whitewash-----	Somewhat limited Droughty	0.98	Very limited Cutbanks cave Deep to water	1.00 1.00
203D: Frohling-----	Very limited Depth to cemented pan Slope Droughty Water erosion	1.00 1.00 0.94 0.01	Very limited Depth to thick cemented pan Cutbanks cave Deep to water Dense layer Slope	1.00 1.00 1.00 1.00 0.50 0.37
203E: Frohling-----	Very limited Slope Depth to cemented pan Droughty Water erosion	1.00 1.00 0.94 0.01	Very limited Depth to thick cemented pan Slope Cutbanks cave Deep to water Dense layer	1.00 1.00 1.00 1.00 1.00 0.50
204: Gogomain-----	Very limited Depth to saturated zone Water erosion Restricted permeability	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Too clayey	1.00 1.00 1.00 1.00 1.00 0.50
205B: Kalkaska, burned----	Somewhat limited Droughty Slope	0.87 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
205D: Kalkaska, burned----	Very limited Slope Droughty	1.00 0.87	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
206B: Deerton-----	Somewhat limited Droughty Depth to soft bedrock Slope Depth to bedrock	0.95 0.20 0.16 0.08	Very limited Cutbanks cave Deep to water Depth to soft bedrock Depth to bedrock	1.00 1.00 0.20 0.08
211D: Frohling-----	Very limited Depth to cemented pan Slope Droughty Water erosion	1.00 1.00 0.94 0.01	Very limited Depth to thick cemented pan Cutbanks cave Deep to water Dense layer Slope	1.00 1.00 1.00 1.00 0.50 0.37

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
211D: Wallace-----	Very limited		Very limited	
	Droughty	1.00	Depth to thin cemented pan	1.00
	Slope	1.00	Cutbanks cave	1.00
			Deep to water	1.00
			Slope	0.37
211E: Frohling-----	Very limited		Very limited	
	Slope	1.00	Depth to thick cemented pan	1.00
	Depth to cemented pan	1.00	Slope	1.00
	Droughty	0.94	Cutbanks cave	1.00
	Water erosion	0.01	Deep to water	1.00
			Dense layer	0.50
Wallace-----	Very limited		Very limited	
	Slope	1.00	Depth to thin cemented pan	1.00
	Droughty	1.00	Slope	1.00
			Cutbanks cave	1.00
			Deep to water	1.00
212: Markey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00
214D: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	0.37
Markey-----	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Cutbanks cave	1.00
			Frost action	1.00
			Ponding	1.00
			Content of organic matter	1.00
214E: Rousseau-----	Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00
	Droughty	0.84	Deep to water	1.00
			Slope	1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
214E: Markey-----	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Cutbanks cave Frost action Ponding Content of organic matter	1.00 1.00 1.00 1.00 1.00
215B: Wallace-----	Very limited Droughty Slope	1.00 0.16	Very limited Depth to thin cemented pan Cutbanks cave Deep to water	1.00 1.00 1.00
Alcona-----	Slightly limited Water erosion Slope	0.17 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
215D: Wallace-----	Very limited Droughty Slope	1.00 1.00	Very limited Depth to thin cemented pan Cutbanks cave Deep to water Slope	1.00 1.00 1.00 1.00 0.37
Alcona-----	Very limited Slope Water erosion	1.00 0.17	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
246B: Garlic-----	Somewhat limited Droughty Slope	0.74 0.16	Very limited Cutbanks cave Deep to water	1.00 1.00
246D: Garlic-----	Very limited Slope Droughty	1.00 0.74	Very limited Cutbanks cave Deep to water Slope	1.00 1.00 0.37
286B: Fence-----	Very limited Water erosion Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.60 0.16	Very limited Depth to saturated zone Frost action Cutbanks cave	1.00 1.00 1.00 1.00
287B: Noseum-----	Somewhat limited Depth to saturated zone Water erosion Slope	0.86 0.17 0.04	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00

Table 14b.--Water Management--Continued

Map symbol and soil name	Grassed waterways		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value
300: Beaches-----	Not rated		Not rated	
W: Water-----	Not rated		Not rated	

Table 15.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
10D: Ontonagon-----	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	25-35	5-15
	7-13	Silty clay, silt loam	CH, CL	A-6	0	0	100	100	90-100	75-95	30-70	11-40
	13-21	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
	21-32	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
	32-80	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
15B: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
15D: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
15E: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
15F: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
16B: Graveraet-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	ML, SM	A-4	0	0-15	85-100	85-100	55-85	30-50	15-25	NP-7
	4-7	Fine sandy loam	ML, SM	A-4	0	0-15	85-100	85-100	55-85	30-50	15-25	NP-7
	7-10	Fine sandy loam, sandy loam	SM, ML	A-4	0	0-15	85-100	85-100	55-85	30-60	15-25	NP-7
	10-17	Fine sandy loam, sandy loam	SM, ML	A-4	0	0-15	85-100	85-100	55-85	30-60	15-25	NP-7
	17-33	Loamy sand, loam, sandy clay loam	ML, SM	A-2-4, A-4	0	0-15	85-100	85-100	50-80	25-55	15-25	NP-7
	33-48	Sandy clay loam, loamy sand, fine sandy loam	CL-ML, CL	A-2-4, A-4	0	0-15	85-100	85-100	60-80	25-55	25-35	4-15
	48-68	Sandy clay loam, fine sandy loam	CL, CL-ML	A-4	0	0-15	85-100	85-100	60-80	25-55	25-35	4-15
	68-80	Sandy loam	SM, ML	A-2-4, A-4	0	0-15	85-95	85-95	35-80	15-50	15-25	NP-7
17C: Deer Park-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-0	NP
	3-10	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	10-21	Sand, fine sand	SP-SM, SP	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	21-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
17E: Deer Park-----	In											
	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-0	NP
	3-10	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	10-21	Sand, fine sand	SP-SM, SP	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	21-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
17F: Deer Park-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-3	Sand	SP-SM, SP	A-3	0	0	100	100	50-70	0-15	0-0	NP
	3-10	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	10-21	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
	21-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	0	100	100	50-95	0-35	0-0	NP
18B: Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
18D: Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
18E: Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
18F: Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
19B: Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
19D: Kalkaska-----	0-2	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
19E: Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
19F:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP	
20B:												
Crowell-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
21A:												
Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-11	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	11-42	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	42-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	0-35	0-0	NP
22:												
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
23:												
Leafriver-----	0-2	Mucky peat, muck	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Muck	PT	A-8	0	0	---	---	---	---	---	---
	8-10	Loamy fine sand, sand, loamy sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	85-100	45-70	3-35	0-20	NP-4
	10-80	Fine sand, sand, loamy sand	SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	85-100	45-70	3-35	0-20	NP-4

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
24B: Springlake-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Loamy coarse sand, loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	35-75	10-30	5-20	NP-4
	7-9	Loamy coarse sand, loamy sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	5-30	5-20	NP-4
	9-14	Loamy coarse sand, loamy sand, sand, gravelly loamy coarse sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	5-30	5-20	NP-4
	14-23	Loamy coarse sand, loamy sand, sand, gravelly loamy coarse sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	5-30	5-20	NP-4
	23-26	Gravelly coarse sand, gravelly sand, sand	SP, SW, SP-SM	A-1-b, A-2-4, A-3	0	0	70-90	50-90	30-60	0-10	0-0	NP
	26-80	Gravelly coarse sand, gravelly sand, sand	SP-SM, SP, SW	A-1-b, A-2-4, A-3	0	0	70-90	50-90	30-60	0-10	0-0	NP
	29A: Solona-----	0-6	Fine sandy loam	SM	A-4	0	0-8	90-100	85-95	55-85	30-50	15-20
6-18		Fine sandy loam, loam	ML, SM	A-4	0	0-8	90-100	85-95	55-90	30-70	15-25	NP-7
18-25		Fine sandy loam, loam, sandy loam	ML, SM	A-4, A-2-4	0	0-8	90-100	85-95	50-90	25-70	22-28	3-9
25-80		Gravelly fine sandy loam	SM	A-4	0	3-10	65-80	60-75	45-70	25-50	17-25	1-7
30: Kinross-----	0-3	Muck	PT	A-8	0	0	---	---	---	---	---	---
	3-14	Sand	SP-SM, SM	A-2-4, A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	14-22	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	22-35	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	35-80	Sand, fine sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
31B: McMillan-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-3, A-2-4	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-3, A-2-4	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-1, A-2, A-3	0	0-7	90-100	85-100	35-75	5-30	0-14	NP
31D: McMillan-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7
	4-6	Fine sandy loam	SC-SM, SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-2, A-3, A-1	0	0-7	90-100	85-100	35-75	5-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
31E: McMillan-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-2, A-3, A-1	0	0-7	90-100	85-100	35-75	5-30	0-14	NP
31F: McMillan-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	9-16	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-2, A-3, A-1	0	0-7	90-100	85-100	35-75	5-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
32A:												
Allendale-----	0-5	Loamy fine sand	SP-SM, SM	A-2-4, A-4	0	0	95-100	90-100	45-80	10-40	0-14	NP
	5-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	8-10	Loamy fine sand, fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	10-31	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	31-35	Silty clay, clay	CH, MH	A-7	0	0	100	90-100	90-100	75-95	50-70	20-40
	35-80	Clay, silty clay	MH, CH	A-7	0	0	100	90-100	90-100	75-95	50-70	20-40
33. Pits												
35:												
Histosols-----	0-51	Muck	PT	A-8	0	0	---	---	---	---	---	NP
	51-80	Variable	---	---	---	---	---	---	---	---	---	---
Aquents-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
36:												
Carbondale-----	0-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
Lupton-----	0-4	Peat	PT	A-8	0	0	---	---	---	---	0-0	NP
	4-80	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
Tawas-----	0-26	Muck	PT	A-8	0	0	---	---	---	---	---	---
	26-80	Sand, fine sand, coarse sand, gravelly sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
37:												
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10	3-10	4	10	40	200			
					inches	inches							
				Pct	Pct					Pct			
37:													
Greenwood-----	0-65	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---	---
	65-80	Muck	PT	A-8	0	0	---	---	---	---	---	---	---
Loxley-----	0-8	Peat	PT	A-8	0	0	---	---	---	---	---	---	---
	8-80	Muck	PT	A-8	0	0	---	---	---	---	---	---	---
45D:													
Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	
45E:													
Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP	
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
46B: Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	8-12	Loamy sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	95-100	85-100	50-75	5-30	0-14	NP-4
	12-23	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-3, A-2-4	0	0-5	95-100	75-100	50-70	5-15	0-14	NP
46D: Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	8-12	Loamy sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	95-100	85-100	50-75	5-30	0-14	NP-4
	12-23	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-3, A-2-4	0	0-5	95-100	75-100	50-70	5-15	0-14	NP
46E: Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	8-12	Loamy sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	95-100	85-100	50-75	5-30	0-14	NP-4
	12-23	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-3, A-2-4	0	0-5	95-100	75-100	50-70	5-15	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
46F: Kalkaska-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-6	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	6-8	Loamy sand	SM	A-2-4	0	0-5	95-100	85-100	50-75	15-30	0-14	NP-4
	8-12	Loamy sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	95-100	85-100	50-75	5-30	0-14	NP-4
	12-23	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	23-38	Sand	SM	A-2-4, A-3	0	0-5	95-100	85-100	50-70	5-15	0-14	NP
	38-80	Sand	SM	A-3, A-2-4	0	0-5	95-100	75-100	50-70	5-15	0-14	NP
47B: Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
47D: Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6
53B: Menominee, sandy substratum-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	8-11	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	11-34	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	34-46	Clay loam, fine sandy loam, fine sandy loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	90-100	65-95	35-75	25-35	4-15
	46-62	Loam, fine sandy loam	CL, CL-ML	A-4	0	0-5	95-100	90-100	75-90	55-70	25-35	4-15
	62-80	Stratified sand to loamy sand	SM	A-3, A-2-4	0	0-3	95-100	95-100	50-70	5-30	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
57B: Amadon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Sandy loam	SC, SC-SM	A-1-b, A-2-4, A-4	0	0-25	90-100	80-97	45-85	20-50	20-30	4-10
	8-10	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	10-15	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	15-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Longrie-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Highly decomposed plant material			0	0	---	---	---	---	---	---
	2-6	Sandy loam, fine sandy loam, silt loam	SM, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	50-85	25-50	15-25	NP-7
	6-8	Fine sandy loam, sandy loam, silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	8-23	Fine sandy loam, sandy loam, silt loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	23-36	Sandy loam, fine sandy loam, gravelly sandy loam	SC-SM, SC	A-1-b, A-2-4, A-4	0	0-20	85-100	80-90	40-80	20-50	20-30	4-10
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
57D: Amadon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Sandy loam	SC, SC-SM	A-1-b, A-2-4, A-4	0	0-25	90-100	80-97	45-85	20-50	20-30	4-10
	8-10	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	10-15	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	15-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Longrie-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Highly decomposed plant material			0	0	---	---	---	---	---	---
	2-6	Sandy loam, fine sandy loam, silt loam	SM, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	50-85	25-50	15-25	NP-7
	6-8	Fine sandy loam, sandy loam, silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	8-23	Fine sandy loam, sandy loam, silt loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	23-36	Sandy loam, fine sandy loam, gravelly sandy loam	SC-SM, SC	A-1-b, A-2-4, A-4	0	0-20	85-100	80-90	40-80	20-50	20-30	4-10
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
57E: Amadon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Sandy loam	SC, SC-SM	A-1-b, A-2-4, A-4	0	0-25	90-100	80-97	45-85	20-50	20-30	4-10
	8-10	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	10-15	Fine sandy loam, cobbly sandy loam, silt loam	SC-SM, SC, CL	A-2-4, A-4	0	0-25	95-100	80-97	55-95	25-80	20-30	4-10
	15-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Longrie-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Highly decomposed plant material			0	0	---	---	---	---	---	---
	2-6	Sandy loam, fine sandy loam, silt loam	SM, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	50-85	25-50	15-25	NP-7
	6-8	Fine sandy loam, sandy loam, silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	8-23	Fine sandy loam, sandy loam, silt loam	CL-ML, CL, SC-SM, SC	A-2-4, A-4	0	0-20	95-100	85-100	55-95	25-80	20-30	4-10
	23-36	Sandy loam, fine sandy loam, gravelly sandy loam	SC-SM, SC	A-1-b, A-2-4, A-4	0	0-20	85-100	80-90	40-80	20-50	20-30	4-10
	36-80	Bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
60A:												
Kinross-----	0-3	Muck	PT	A-8	0	0	---	---	---	---	---	---
	3-14	Sand	SP-SM, SM	A-2-4, A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	14-22	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	22-35	Sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
	35-80	Sand, fine sand	SP-SM	A-3	0	0	100	90-100	50-80	5-30	0-14	NP
Au Gres-----												
Au Gres-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM	A-3, A-2-4	0	0	95-100	90-100	45-70	5-15	0-0	NP
	7-17	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	45-70	5-15	0-0	NP
	17-28	Sand	SP-SM, SM	A-2-4, A-3	0	0	90-100	85-100	40-70	5-15	0-0	NP
	28-80	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	85-100	40-70	5-15	0-0	NP
61B:												
Paquin-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-12	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	12-14	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	14-17	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	17-27	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	27-34	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	34-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	65B:											
Rubicon, organic surface-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
65D: Rubicon, organic surface-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
65E: Rubicon, organic surface-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
66B: Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Kaks-----	0-4	Sandy loam	SM	A-4, A-2-4	0	1-15	95-100	85-95	55-65	25-40	15-20	NP-4
	4-21	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	7-23	95-100	85-95	55-65	25-40	15-20	NP-4
	21-35	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	23-37	85-95	70-85	40-60	20-35	15-20	NP-4
	35-80	Sand, loamy sand	SM	A-2-4	0	0-7	95-100	85-95	50-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
66D:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP	
Kaks-----												
	0-4	Sandy loam	SM	A-4, A-2-4	0	1-15	95-100	85-95	55-65	25-40	15-20	NP-4
	4-21	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	7-23	95-100	85-95	55-65	25-40	15-20	NP-4
	21-35	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	23-37	85-95	70-85	40-60	20-35	15-20	NP-4
	35-80	Sand, loamy sand	SM	A-2-4	0	0-7	95-100	85-95	50-70	5-15	0-0	NP
66E:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP	
Kaks-----												
	0-4	Sandy loam	SM	A-4, A-2-4	0	1-15	95-100	85-95	55-65	25-40	15-20	NP-4
	4-21	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	7-23	95-100	85-95	55-65	25-40	15-20	NP-4
	21-35	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	23-37	85-95	70-85	40-60	20-35	15-20	NP-4
	35-80	Sand, loamy sand	SM	A-2-4	0	0-7	95-100	85-95	50-70	5-15	0-0	NP
66F:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP	

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
66F:												
Kaks-----	0-4	Sandy loam	SM	A-4, A-2-4	0	1-15	95-100	85-95	55-65	25-40	15-20	NP-4
	4-21	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	7-23	95-100	85-95	55-65	25-40	15-20	NP-4
	21-35	Gravelly loamy sand, cobbly loamy sand	SM	A-2-4	0	23-37	85-95	70-85	40-60	20-35	15-20	NP-4
	35-80	Sand, loamy sand	SM	A-2-4	0	0-7	95-100	85-95	50-70	5-15	0-0	NP
74B:												
Menominee, sandy substratum-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	8-11	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	11-34	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	34-46	Clay loam, fine sandy loam, fine sandy loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	90-100	65-95	35-75	25-35	4-15
	46-62	Loam, fine sandy loam	CL, CL-ML	A-4	0	0-5	95-100	90-100	75-90	55-70	25-35	4-15
	62-80	Stratified sand to loamy sand	SM	A-3, A-2-4	0	0-3	95-100	95-100	50-70	5-30	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
74B: Graveraet-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	ML, SM	A-4	0	0-15	85-100	85-100	55-85	30-50	15-25	NP-7
	4-7	Fine sandy loam	ML, SM	A-4	0	0-15	85-100	85-100	55-85	30-50	15-25	NP-7
	7-10	Fine sandy loam, sandy loam	SM, ML	A-4	0	0-15	85-100	85-100	55-85	30-60	15-25	NP-7
	10-17	Fine sandy loam, sandy loam	SM, ML	A-4	0	0-15	85-100	85-100	55-85	30-60	15-25	NP-7
	17-33	Loamy sand, loam, sandy clay loam	ML, SM	A-2-4, A-4	0	0-15	85-100	85-100	50-80	25-55	15-25	NP-7
	33-48	Sandy clay loam, loamy sand, fine sandy loam	CL-ML, CL	A-2-4, A-4	0	0-15	85-100	85-100	60-80	25-55	25-35	4-15
	48-68	Sandy clay loam, fine sandy loam	CL, CL-ML	A-4	0	0-15	85-100	85-100	60-80	25-55	25-35	4-15
	68-80	Sandy loam	SM, ML	A-2-4, A-4	0	0-15	85-95	85-95	35-80	15-50	15-25	NP-7
75D: Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	8-11	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	11-21	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP-5
	31-80	Sand, stratified sand to loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
75D:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
75E:												
Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	8-11	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	11-21	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP-5
	31-80	Sand, stratified sand to loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
75F: Dillingham-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Loamy sand, loamy fine sand	SM	A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	8-11	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	11-21	Loamy fine sand, loamy sand	SP-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
	21-31	Fine sand, loamy fine sand, sand, loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP-5
	31-80	Sand, stratified sand to loamy sand	SP-SM, SM	A-4, A-2-4	0	0-7	95-100	85-100	40-80	10-40	0-20	NP
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
76D: Menominee, sandy substratum-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	8-11	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	11-34	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	34-46	Clay loam, fine sandy loam, fine sandy loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	90-100	65-95	35-75	25-35	4-15
	46-62	Loam, fine sandy loam	CL, CL-ML	A-4	0	0-5	95-100	90-100	75-90	55-70	25-35	4-15
	62-80	Stratified sand to loamy sand	SM	A-3, A-2-4	0	0-3	95-100	95-100	50-70	5-30	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
76D: Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6
76E: Menominee, sandy substratum-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-8	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	8-11	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	11-34	Sand	SM	A-2-4, A-3	0	0-3	95-100	95-100	50-70	5-15	0-0	NP
	34-46	Clay loam, fine sandy loam, fine sandy loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	90-100	65-95	35-75	25-35	4-15
	46-62	Loam, fine sandy loam	CL, CL-ML	A-4	0	0-5	95-100	90-100	75-90	55-70	25-35	4-15
	62-80	Stratified sand to loamy sand	SM	A-3, A-2-4	0	0-3	95-100	95-100	50-70	5-30	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
76E: Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6
84B: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
				Pct	Pct					Pct		
84B: Alcona-----	In											
	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam	SM, SC-SM, ML	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	3-17	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM, SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	17-23	Very fine sandy loam, loamy fine sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	95-100	90-100	75-90	45-60	20-30	NP-10
	23-54	Loamy fine sand, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM	A-4	0	0	95-100	90-100	50-80	35-50	20-30	NP-10
	54-80	Stratified loamy very fine sand to fine sandy loam to very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	95-100	90-100	65-90	35-60	15-30	NP-10
84D: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
84D: Alcona-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam	SM, SC-SM, ML	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	3-17	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM, SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	17-23	Very fine sandy loam, loamy fine sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	95-100	90-100	75-90	45-60	20-30	NP-10
	23-54	Loamy fine sand, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM	A-4	0	0	95-100	90-100	50-80	35-50	20-30	NP-10
	54-80	Stratified loamy very fine sand to fine sandy loam to very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	95-100	90-100	65-90	35-60	15-30	NP-10
84E: Liminga-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-7	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	7-9	Fine sand	SM, SP-SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	9-22	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	22-31	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP
	31-80	Fine sand	SP-SM, SM	A-2-4	0	0-5	95-100	95-100	60-80	10-35	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
84E: Alcona-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam	SM, SC-SM, ML	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	3-17	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM, SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	17-23	Very fine sandy loam, loamy fine sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	95-100	90-100	75-90	45-60	20-30	NP-10
	23-54	Loamy fine sand, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM	A-4	0	0	95-100	90-100	50-80	35-50	20-30	NP-10
	54-80	Stratified loamy very fine sand to fine sandy loam to very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	95-100	90-100	65-90	35-60	15-30	NP-10
85B: Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
85B: Okeefe-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	6-7	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	7-19	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	19-31	Sand, fine sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-35	0-14	NP-4
	31-80	Stratified loamy very fine sand to very fine sandy loam, stratified silt loam to silt	CL, CL-ML	A-4	0	0	100	100	60-100	50-100	5-15	4-20
85D: Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Okeefe-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	6-7	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	7-19	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	19-31	Fine sand, sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-35	0-14	NP-4
	31-80	Stratified loamy very fine sand to very fine sandy loam, stratified silt loam to silt	CL, CL-ML	A-4	0	0	100	100	60-100	50-100	5-15	4-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
85E:												
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
Okeefe-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	6-7	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	7-19	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-15	0-14	NP-4
	19-31	Fine sand, sand	SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-35	0-14	NP-4
	31-80	Stratified silt loam to silt, stratified loamy very fine sand to very fine sandy loam	CL, CL-ML	A-4	0	0	100	100	60-100	50-100	5-15	4-20
88B:												
Croswell-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
Au Gres-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM	A-3, A-2-4	0	0	95-100	90-100	45-70	5-15	0-0	NP
	7-17	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	45-70	5-15	0-0	NP
	17-28	Sand	SP-SM, SM	A-2-4, A-3	0	0	90-100	85-100	40-70	5-15	0-0	NP
	28-80	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
89A:												
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	---	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	---	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	---	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	---	NP
Finch-----												
	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-11	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	11-42	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	42-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	0-35	0-0	NP
90D:												
Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	---	---	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Spot-----												
	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
90E:												
Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SP-SM, SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	4-20	Fine sand	SP-SM, SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	20-33	Fine sand	SP-SM, SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
90E:												
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
90F:												
Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
91D:												
Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	4-20	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	20-33	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	33-66	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
91E:												
Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	4-20	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	20-33	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	75-95	10-35	0-0	NP
	33-66	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
91F: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
93F: Ontonagon-----	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	25-35	5-15
	7-13	Silty clay, silt loam	CH, CL	A-6	0	0	100	100	90-100	75-95	30-70	11-40
	13-21	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
	21-32	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
	32-60	Clay	CH	A-7	0	0	100	100	90-100	75-95	65-90	40-55
Pickford, occasionally flooded-----	0-6	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	6-9	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	9-13	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	40-70	20-40
	13-24	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40
	24-80	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40
94A: Tawas-----	0-26	Muck	PT	A-8	0	0	---	---	---	---	---	---
	26-80	Sand, fine sand, coarse sand, gravelly sand	SP-SM, SP	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	---	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	---	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	---	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	---	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10	3-10	4	10	40	200			
					inches	inches							
					Pct	Pct					Pct		
94A:													
Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	1-11	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP	
	11-42	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP	
	42-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	0-35	0-0	NP	
102:													
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP	
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP	
104B:													
Pence-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	1-5	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-8	95-100	90-100	65-100	35-55	0-25	NP-7	
	5-6	Very fine sandy loam	ML, SM, SC-SM	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7	
	6-13	Very fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7	
	13-20	Fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-85	30-55	0-25	NP-7	
	20-27	Sand	SM, SP-SM	A-2, A-3	0	0-8	90-100	90-100	40-70	5-15	0-14	NP	
	27-80	Sand	SM, SP-SM	A-2, A-3	0	0-15	90-100	85-100	40-70	5-15	0-14	NP	

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
104D: Pence-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-5	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-8	95-100	90-100	65-100	35-55	0-25	NP-7
	5-6	Very fine sandy loam	ML, SM, SC-SM	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7
	6-13	Very fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7
	13-20	Fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-85	30-55	0-25	NP-7
	20-27	Sand	SM, SP-SM	A-2, A-3	0	0-8	90-100	90-100	40-70	5-15	0-14	NP
	27-80	Sand	SM, SP-SM	A-2, A-3	0	0-15	90-100	85-100	40-70	5-15	0-14	NP
104E: Pence-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-5	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0-8	95-100	90-100	65-100	35-55	0-25	NP-7
	5-6	Very fine sandy loam	ML, SM, SC-SM	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7
	6-13	Very fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-95	35-65	0-25	NP-7
	13-20	Fine sandy loam	SM, SC-SM, ML	A-4	0	0-8	95-100	90-100	65-85	30-55	0-25	NP-7
	20-27	Sand	SM, SP-SM	A-2, A-3	0	0-8	90-100	90-100	40-70	5-15	0-14	NP
	27-80	Sand	SM, SP-SM	A-2, A-3	0	0-15	90-100	85-100	40-70	5-15	0-14	NP
109D: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
109F: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP
110D: Au Gres-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM	A-3, A-2-4	0	0	95-100	90-100	45-70	5-15	0-0	NP
	7-17	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	45-70	5-15	0-0	NP
	17-28	Sand	SP-SM, SM	A-2-4, A-3	0	0	90-100	85-100	40-70	5-15	0-0	NP
	28-80	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	85-100	40-70	5-15	0-0	NP
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP
Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
110E: Au Gres-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM	A-3, A-2-4	0	0	95-100	90-100	45-70	5-15	0-0	NP
	7-17	Sand	SM	A-2-4, A-3	0	0	95-100	90-100	45-70	5-15	0-0	NP
	17-28	Sand	SP-SM, SM	A-2-4, A-3	0	0	90-100	85-100	40-70	5-15	0-0	NP
	28-80	Sand	SP-SM, SM	A-3, A-2-4	0	0	90-100	85-100	40-70	5-15	0-0	NP
Dawson-----	0-10	Peat	PT	A-8	0	0	---	---	---	---	---	---
	10-19	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	19-38	Muck	PT	A-8	0	0	---	---	---	---	---	---
	38-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	90-100	50-100	40-95	0-35	0-0	NP
Rubicon-----	0-2	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	7-32	Sand	SM, SP, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	32-40	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
	40-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	85-100	40-70	0-15	0-0	NP
116: Udipsamments----	0-80	Sand	---	---	0	0	85-100	75-100	30-75	0-25	0-14	NP
Udorthents-----	0-1	Variable	SM, SC-SM	---	---	---	---	---	---	---	---	---
	1-80	Variable	---	---	---	---	---	---	---	---	---	---
117D: Manistee, sandy substratum-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-10	Sand	SM	A-2-4, A-3	0	0	100	95-100	50-70	5-15	0-14	NP
	10-26	Sand	SM	A-2-4, A-3	0	0	100	95-100	50-70	5-15	0-14	NP
	26-30	Clay, silty clay loam	CH, CL	A-7	0	0	100	100	85-100	75-95	40-65	20-40
	30-36	Clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	20-40
	36-64	Clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	20-40
	64-80	Loamy sand, sand	SM	A-2-4	0	0	85-100	80-100	40-60	5-25	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10	3-10	4	10	40	200			
					inches	inches							
					Pct	Pct					Pct		
120B: McMillan-----	In												
	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7	
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	6-9	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP	
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP	
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-2, A-3, A-1	0	0-7	90-100	85-100	35-75	5-30	0-14	NP	
Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4	
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2	
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2	
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5	
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3	
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17	
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6	

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
120D: McMillan-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-3, A-2-4	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-3, A-2-4	0	0-7	90-100	85-100	50-80	5-45	0-14	NP
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-1, A-2, A-3	0	0-7	90-100	85-100	35-75	5-30	0-14	NP
Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10	3-10	4	10	40	200			
					inches	inches							
					Pct	Pct					Pct		
120E: McMillan-----	In												
	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---	---
	1-4	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-75	30-50	0-25	NP-7	
	4-6	Fine sandy loam	SM, SC-SM	A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	6-9	Very fine sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	9-16	Very fine sandy loam, fine sandy loam	SM, SC-SM	A-4, A-2-4	0	0-7	95-100	85-100	55-80	30-55	0-25	NP-7	
	16-22	Loamy fine sand, loamy sand	SM, SP-SM, SC-SM	A-2-4, A-3	0	0-7	90-100	85-100	50-80	5-45	0-14	NP	
	22-32	Sand, fine sand	SM, SP-SM, SC-SM	A-3, A-2-4	0	0-7	90-100	85-100	50-80	5-45	0-14	NP	
	32-80	Stratified sand to loamy sand	SC-SM, SM, SP-SM	A-1, A-2, A-3	0	0-7	90-100	85-100	35-75	5-30	0-14	NP	
Trenary-----	0-2	Fine sandy loam	SM	A-4	0-4	0-8	90-100	85-95	55-85	30-50	0-20	NP-4	
	2-6	Fine sandy loam, silt loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2	
	6-12	Fine sandy loam, sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-85	0-18	NP-2	
	12-17	Fine sandy loam, very fine sandy loam	ML, SM	A-4	0-4	0-8	90-100	85-95	55-90	30-65	0-22	NP-5	
	17-26	Sandy loam, loamy sand	SM	A-4	0-4	0-8	90-100	85-95	40-70	10-40	0-20	NP-3	
	26-37	Sandy clay loam, fine sandy loam	SC, SM	A-6, A-4	0-4	0-8	90-100	85-95	55-90	30-50	25-37	3-17	
	37-80	Sandy loam, gravelly fine sandy loam, cobbly fine sandy loam	SM	A-4	0-4	0-20	70-95	65-90	40-80	20-50	15-24	NP-6	

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
122. Pits, quarry												
126: Pickford-----	0-6	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	6-9	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	9-13	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	40-70	20-40
	13-24	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40
	24-80	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40
129A: Rudyard-----	0-5	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
	5-8	Silty clay loam, silt loam	CL	A-6, A-4, A-7	0	0	100	100	90-100	70-90	25-50	5-40
	8-22	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
	22-29	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
	29-80	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
130A: Rudyard-----	0-5	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
	5-8	Silty clay loam, silt loam	CL	A-6, A-4, A-7	0	0	100	100	90-100	70-90	25-50	5-40
	8-22	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
	22-29	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
	29-80	Clay	CH	A-7	0	0	100	100	95-100	85-95	65-90	40-55
Pickford-----	0-6	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	6-9	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	90-100	70-90	25-40	7-15
	9-13	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	40-70	20-40
	13-24	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40
	24-80	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	45-70	25-40

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
132B: Sugar-----	0-1	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Very fine sandy loam, loamy very fine sand	CL-ML	A-4	0	0	100	100	85-100	50-90	5-25	2-7
	4-11	Loamy very fine sand	CL-ML	A-4	0	0	100	100	75-90	35-65	5-25	2-7
	11-20	Very fine sandy loam, silt loam	CL-ML	A-4	0	0	100	100	85-100	50-90	5-25	2-7
	20-27	Loamy very fine sand, very fine sandy loam	CL-ML	A-4	0	0	100	100	75-90	35-65	5-25	2-7
	27-35	Silt loam, loamy very fine sand	CL, CL-ML	A-4	0	0	100	100	85-100	50-90	20-30	5-10
	35-46	Silty clay loam, silty clay	CH	A-7	0	0	100	100	90-100	75-95	45-70	25-40
	46-80	Clay	CH	A-7	0	0	100	100	90-100	75-95	45-70	25-40
133: Dorval-----	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-19	Muck	PT	A-8	0	0	---	---	---	---	---	---
	19-23	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	23-33	Silty clay loam, silty clay, clay	CH	A-7	0	0	100	100	90-100	90-100	45-70	25-40
	33-80	Silty clay, clay	CH	A-7	0	0	100	100	90-100	90-100	45-70	25-40

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
143: Caffey-----	0-6	Muck	PT	A-8	0	0	---	---	---	---	0-14	---
	6-12	Sand, loamy sand	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	50-90	5-45	0-14	NP
	12-21	Stratified sand to fine sand, loamy sand	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	50-90	5-45	0-14	NP
	21-35	Stratified loamy very fine sand to very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	65-100	50-90	20-40	4-20
	35-80	Very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	65-100	50-90	20-40	4-20
146A: Allendale-----	0-5	Loamy fine sand	SP-SM, SM	A-2-4, A-4	0	0	95-100	90-100	45-80	10-40	0-14	NP
	5-8	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	8-10	Loamy fine sand, fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	10-31	Fine sand, loamy fine sand	SM, SP-SM	A-2-4	0	0	95-100	90-100	45-80	10-35	0-14	NP
	31-35	Silty clay, clay	CH, MH	A-7	0	0	100	90-100	90-100	75-95	50-70	20-40
	35-80	Clay, silty clay	MH, CH	A-7	0	0	100	90-100	90-100	75-95	50-70	20-40
Fibre-----	0-5	Muck	PT	A-8	0	0	---	---	---	---	---	---
	5-13	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	100	90-100	50-80	5-35	0-20	NP-4
	13-17	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	100	90-100	50-80	5-35	0-20	NP-4
	17-19	Loamy sand, fine sandy loam	SM, ML	A-2-4, A-4	0	0	100	90-100	50-85	15-55	0-30	NP-11
	19-27	Clay, silty clay	CH	A-7	0	0	100	100	95-100	75-95	40-70	20-45
	27-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	75-95	40-70	25-45

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
167D: Battydoe-----	0-1	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam, cobbly sandy loam	SM	A-2-4, A-4	0-15	7-25	90-100	85-95	55-85	30-50	15-20	NP-4
	3-5	Loamy sand, sandy loam, cobbly fine sandy loam	SM	A-1-b, A-2-4, A-4	0-15	7-25	90-100	85-95	40-75	15-50	15-20	NP-4
	5-11	Fine sandy loam, cobbly sandy loam	SM	A-2-4, A-4	0-15	7-25	90-100	85-95	55-80	30-50	15-20	NP-4
	11-20	Loamy sand, cobbly sandy loam	SM	A-1-b, A-2-4, A-4	0-15	7-25	90-100	85-95	40-75	15-50	15-20	NP-4
	20-28	Gravelly fine sandy loam, gravelly sandy loam	SM, SC-SM	A-1-b, A-2-4, A-4	0-15	7-25	90-100	50-85	35-65	15-40	15-25	NP-7
	28-80	Gravelly fine sandy loam, gravelly sandy loam	SM, SC-SM	A-1-b, A-2-4, A-4	0-15	7-25	90-100	50-85	35-65	15-40	15-25	NP-7
Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
173B: Paquin-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-12	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	12-14	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	14-17	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	17-27	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	27-34	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	34-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
173B: Finch-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-11	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	11-42	Sand	SP, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	42-80	Fine sand, sand	SP-SM, SP	A-2-4, A-3	0	0	95-100	90-100	50-95	0-35	0-0	NP
174B: Croswell-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM, SP-SM	A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
175D: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	95-100	45-70	0-30	0-14	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
175E: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
176B: Paquin-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-12	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	12-14	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	14-17	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	17-27	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	27-34	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
	34-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	50-80	5-30	0-14	NP
Spot-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	8-10	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	5-35	0-0	NP
	10-18	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
	18-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	5-35	0-0	NP
179B: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
179D: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
179E: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
179F: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
180B: Millecoquins----	0-2	Silt loam, very fine sandy loam	CL-ML, ML	A-4	0	0-5	100	95-100	75-90	50-90	15-25	NP-8
	2-4	Silt loam, very fine sandy loam	CL-ML, ML	A-4	0	0-5	100	95-100	75-90	50-90	15-25	NP-8
	4-5	Silt loam, very fine sandy loam	CL-ML, ML	A-4	0	0-5	100	95-100	75-90	50-90	15-25	NP-8
	5-12	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-5	100	95-100	75-90	50-90	15-25	NP-8
	12-25	Silty clay loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	50-95	25-45	7-22
	25-31	Silty clay loam, silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	50-95	25-45	7-22
	31-55	Stratified silt loam to silty clay loam	CL	A-4, A-7, A-6	0	0	100	100	85-100	50-95	25-45	9-22
	55-80	Fine sandy loam, loam	CL-ML	A-4, A-6	0	0-5	100	85-98	55-90	45-80	20-35	4-11
186D: Sporley-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-8	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	100	97-100	85-100	65-90	10-20	NP-7
	8-11	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	85-100	65-90	10-20	NP-7
	11-16	Very fine sandy loam, silt loam, fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	75-100	40-80	10-20	NP-7
	16-22	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	22-45	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	45-80	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
186E: Sporley-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-8	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	100	97-100	85-100	65-90	10-20	NP-7
	8-11	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	85-100	65-90	10-20	NP-7
	11-16	Very fine sandy loam, silt loam, fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	75-100	40-80	10-20	NP-7
	16-22	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	22-45	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	45-80	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
186F: Sporley-----	0-4	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-8	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	100	97-100	85-100	65-90	10-20	NP-7
	8-11	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	85-100	65-90	10-20	NP-7
	11-16	Silt loam, very fine sandy loam, fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	75-100	40-80	10-20	NP-7
	16-22	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	22-45	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10
	45-80	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0-1	98-100	97-100	90-100	70-90	15-25	NP-10

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
187B: Auger-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Silt loam	ML	A-4	0	0	95-100	90-100	90-100	70-90	0-20	NP-4
	5-6	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-20	NP-4
	6-15	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-20	NP-4
	15-25	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-25	NP-4
	25-80	Stratified silt loam to silt, stratified silt loam to very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-25	NP-4
188: Hendrie-----	0-4	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-20	NP-4
	7-16	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7
	16-80	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7
189A: Bodi-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-95	65-85	0-20	NP-4
	4-5	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-100	65-85	0-20	NP-4
	5-17	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-100	65-85	0-20	NP-4
	17-24	Sand, loamy sand	SM	A-1-b, A-2	0-7	1-15	95-100	90-100	45-70	5-25	0-0	NP
	24-44	Loamy sand, sandy loam, loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0-7	1-15	95-100	90-100	65-90	15-40	0-20	NP-6
	44-80	Sandy loam, loamy sand	SM	A-4, A-2-4	0-4	1-8	95-100	85-95	65-90	15-40	0-20	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
189A: Chesbrough-----	0-1	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	2-4	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	4-10	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	10-12	Gravelly loamy sand, loamy sand	SM	A-2-4	0-7	1-10	95-100	75-90	40-65	10-25	0-20	NP-4
	12-16	Sandy loam, loamy sand	SC-SM, SM	A-2-4, A-4	0-7	1-10	95-100	75-92	40-65	10-40	0-20	NP-6
	16-22	Sandy loam, loamy sand	SC-SM, SM	A-2-4, A-4	0-7	1-10	95-100	75-92	40-65	10-40	0-20	NP-6
	22-30	Sandy loam	SM	A-2-4	0-7	1-7	95-100	85-97	50-65	10-40	0-20	NP-6
	30-80	Sandy loam, sandy loam, loamy sand	SM	A-2-4	0-7	1-7	95-100	85-97	40-65	10-40	0-20	NP-6
190B: Bodi-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-95	65-85	0-20	NP-4
	4-5	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-100	65-85	0-20	NP-4
	5-17	Silt loam, very fine sandy loam	ML	A-4	0-7	1-15	95-100	90-100	85-100	65-85	0-20	NP-4
	17-24	Sand, loamy sand	SM	A-1-b, A-2	0-7	1-15	95-100	90-100	45-70	5-25	0-0	NP
	24-44	Loamy sand, sandy loam, loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0-7	1-15	95-100	90-100	65-90	15-40	0-20	NP-6
	44-80	Sandy loam, loamy sand	SM	A-4, A-2-4	0-4	1-8	95-100	85-95	65-90	15-40	0-20	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
191D: Widgeon-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	95-100	85-95	50-90	15-25	NP-10
	5-9	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	95-100	70-95	50-90	15-25	NP-10
	9-12	Silt loam, very fine sandy loam	ML, CL-ML	A-6, A-4	0	0	100	95-100	85-100	50-90	15-25	NP-14
	12-16	Silt loam, very fine sandy loam	CL-ML, ML	A-6, A-4	0	0	100	95-100	70-100	50-90	15-25	NP-14
	16-32	Silt loam, silty clay loam	CL-ML, CL, ML	A-7, A-6, A-4	0	0	100	95-100	75-100	70-95	15-45	NP-20
	32-80	Stratified loamy very fine sand to silty clay loam, stratified silt loam to silty clay loam	CL-ML, CL, ML	A-4, A-6, A-7	0	0	100	100	75-100	45-95	10-45	NP-20
Kalkaska-----	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
193A: Annanias-----	0-4	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	0-20	NP-4
	7-10	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	10-15	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	15-26	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-95	50-65	0-25	NP-7
	26-47	Stratified silt loam to very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	47-80	Stratified silt loam to silt	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7
194A: Hendrie-----	0-4	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-20	NP-4
	7-16	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7
	16-80	Silt loam	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7
Annanias-----	0-4	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	0-20	NP-4
	7-10	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	10-15	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	15-26	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-95	50-65	0-25	NP-7
	26-47	Stratified silt loam to very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	47-80	Stratified silt loam to silt	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
195A: Chesbrough-----	0-1	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-2	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	2-4	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	4-10	Silt loam, very fine sandy loam	ML, SM	A-4	0-7	1-10	95-100	85-95	75-95	45-85	0-20	NP-4
	10-12	Gravelly loamy sand, loamy sand	SM	A-2-4	0-7	1-10	95-100	75-90	40-65	10-25	0-20	NP-4
	12-16	Sandy loam, loamy sand	SC-SM, SM	A-2-4, A-4	0-7	1-10	95-100	75-92	40-65	10-40	0-20	NP-6
	16-22	Sandy loam, loamy sand	SC-SM, SM	A-2-4, A-4	0-7	1-10	95-100	75-92	40-65	10-40	0-20	NP-6
	22-30	Sandy loam	SM	A-2-4	0-7	1-7	95-100	85-97	50-65	10-40	0-20	NP-6
	30-80	Sandy loam, sandy loam, loamy sand	SM	A-2-4	0-7	1-7	95-100	85-97	40-65	10-40	0-20	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
197D: Zandi-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	50-90	0-20	NP-4
	6-7	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	50-90	0-20	NP-4
	7-12	Very fine sandy loam, silt loam	ML	A-4	0	0	100	100	85-100	50-90	0-16	NP-4
	12-22	Very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	100	85-100	45-70	0-16	NP-4
	22-37	Stratified loamy very fine sand to very fine sandy loam, stratified very fine sandy loam to silt loam	SM, ML	A-4	0	0	100	100	85-100	45-80	0-16	NP-4
	37-80	Stratified very fine sand to loamy very fine sand, stratified loamy very fine sand to very fine sandy loam	SM, ML	A-4	0	0	100	100	80-100	35-80	0-16	NP-4

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
197E: Zandi-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	50-90	0-20	NP-4
	6-7	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	50-90	0-20	NP-4
	7-12	Very fine sandy loam, silt loam	ML	A-4	0	0	100	100	85-100	50-90	0-16	NP-4
	12-22	Very fine sandy loam, loamy very fine sand	ML, SM	A-4	0	0	100	100	85-100	45-70	0-16	NP-4
	22-37	Stratified loamy very fine sand to very fine sandy loam, stratified very fine sandy loam to silt loam	SM, ML	A-4	0	0	100	100	85-100	45-80	0-16	NP-4
	37-80	Stratified very fine sand to loamy very fine sand, stratified loamy very fine sand to very fine sandy loam	SM, ML	A-4	0	0	100	100	80-100	35-80	0-16	NP-4
198B: Vilas-----	0-3	Loamy sand	SM, SP-SM	A-2-4	0	0-5	95-100	85-100	45-70	10-30	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	5-9	Loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	9-20	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	20-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	85-100	25-70	0-15	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
198D:												
Vilas-----	0-3	Loamy sand	SM, SP-SM	A-2-4	0	0-5	95-100	85-100	45-70	10-30	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	5-9	Loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	9-20	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3	0	0-5	95-100	85-100	45-70	0-30	0-14	NP
	20-80	Sand, coarse sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	85-100	25-70	0-15	0-14	NP
199B:												
Auger-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Silt loam	ML	A-4	0	0	95-100	90-100	90-100	70-90	0-20	NP-4
	5-6	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-20	NP-4
	6-15	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-20	NP-4
	15-25	Silt loam, very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-25	NP-4
	25-80	Stratified silt loam to silt, stratified silt loam to very fine sandy loam	ML	A-4	0	0	95-100	90-100	85-100	50-90	0-25	NP-4
Annanias-----	0-4	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	4-7	Silt loam	ML	A-4	0	0	100	100	90-100	70-90	0-20	NP-4
	7-10	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	10-15	Silt loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	15-26	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-95	50-65	0-25	NP-7
	26-47	Stratified silt loam to very fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-100	50-90	0-25	NP-7
	47-80	Stratified silt loam to silt	ML, CL-ML	A-4	0	0	100	100	90-100	70-90	0-25	NP-7

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
200B: Pence-----	0-1	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	1-4	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	4-6	Sandy loam, gravelly sandy loam	SM	A-2-4, A-4	0	0-15	80-100	75-100	35-75	10-40	0-25	NP-7
	6-17	Gravelly sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	75-100	70-100	35-75	10-40	0-25	NP-7
	17-28	Coarse sand, sand	SM, SP-SM	A-1-b, A-3	0	0-15	75-100	65-90	30-65	0-15	0-14	NP
	28-80	Gravelly sand, gravelly coarse sand	SM, SP-SM	A-1-b, A-3	0	0-15	70-80	65-75	25-55	0-15	0-14	NP
200D: Pence-----	0-1	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	1-4	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	4-6	Sandy loam, gravelly sandy loam	SM	A-2-4, A-4	0	0-15	80-100	75-100	35-75	10-40	0-25	NP-7
	6-17	Gravelly sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	75-100	70-100	35-75	10-40	0-25	NP-7
	17-28	Coarse sand, sand	SM, SP-SM	A-1-b, A-3	0	0-15	75-100	65-90	30-65	0-15	0-14	NP
	28-80	Gravelly sand, gravelly coarse sand	SM, SP-SM	A-1-b, A-3	0	0-15	70-80	65-75	25-55	0-15	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
200E: Pence-----	0-1	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	1-4	Loamy sand, sandy loam	SM	A-2-4	0	0-15	80-100	75-100	35-70	10-40	0-14	NP
	4-6	Sandy loam, gravelly sandy loam	SM	A-2-4, A-4	0	0-15	80-100	75-100	35-75	10-40	0-25	NP-7
	6-17	Gravelly sandy loam, sandy loam	SM	A-4, A-2-4	0	0-15	75-100	70-100	35-75	10-40	0-25	NP-7
	17-28	Coarse sand, sand	SM, SP-SM	A-1-b, A-3	0	0-15	75-100	65-90	30-65	0-15	0-14	NP
	28-80	Gravelly sand, gravelly coarse sand	SM, SP-SM	A-1-b, A-3	0	0-15	70-80	65-75	25-55	0-15	0-14	NP
201B: Crowell, rarely flooded-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	6-15	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	15-22	Sand	SM, SP-SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
	22-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-0	NP
Deford, frequently flooded-----	0-5	Muck	PT	A-8	0	0	---	---	---	---	---	---
	5-32	Fine sand, loamy sand, sand	SM, SP-SM	A-2-4	0	0-3	80-100	75-100	40-90	5-35	0-0	NP
	32-80	Fine sand, loamy sand, sand	SM, SP-SM	A-2-4	0	0-3	80-100	75-100	40-90	5-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
202B: Whitewash-----	0-3	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	3-7	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	90-100	50-95	0-35	0-0	NP
	7-9	Silt loam, fine sandy loam	ML, SM	A-4	0	0	100	100	65-100	40-80	15-25	NP-7
	9-80	Stratified sand to fine sandy loam to silt loam, loamy fine sand, fine sand	SM, SP-SM	A-2-4, A-4	0	0	100	90-100	50-95	5-20	0-0	NP
203D: Frohling-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Loamy sand, fine sandy loam	SM	A-2-4	0	0-8	95-100	90-100	55-85	15-50	0-20	NP-4
	3-7	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	7-19	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	19-55	Sandy loam, loamy sand	SM	A-2-4, A-4	0	0-8	95-100	75-100	40-70	15-40	0-30	NP-9
	55-80	Sandy loam, fine sandy loam	SM	A-2-4, A-4	0	0-8	95-100	75-100	50-70	25-40	0-20	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
203E: Frohling-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Loamy sand, fine sandy loam	SM	A-2-4	0	0-8	95-100	90-100	55-85	15-50	0-20	NP-4
	3-7	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	7-19	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	19-55	Sandy loam, loamy sand	SM	A-2-4, A-4	0	0-8	95-100	75-100	40-70	15-40	0-30	NP-9
	55-80	Sandy loam, fine sandy loam	SM	A-2-4, A-4	0	0-8	95-100	75-100	50-70	25-40	0-20	NP-6
204: Gogomain-----	0-6	Muck	PT	A-8	0	0	---	---	---	---	---	---
	6-10	Very fine sandy loam, loamy very fine sand	ML	A-4	0	0	100	100	85-95	40-65	0-31	NP-6
	10-29	Loamy very fine sand, very fine sandy loam	SM, ML	A-4	0	0	100	100	85-95	40-65	0-23	NP-6
	29-37	Very fine sand, loamy very fine sand, very fine sandy loam	SM, ML	A-4	0	0	100	100	75-95	35-65	0-23	NP-6
	37-80	Clay	CL, CH	A-7	0	0	100	100	95-100	85-95	49-69	29-44
205B: Kalkaska, burned	0-2	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SP-SM, SM	A-3, A-2-4	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
		In			Pct	Pct					Pct	
205D:												
Kalkaska, burned	0-2	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	2-6	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	6-8	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	8-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	16-26	Sand	SM, SP-SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
	26-80	Sand	SP-SM, SM	A-2-4, A-3	0	0-3	95-100	85-100	40-70	5-15	0-0	NP
206B:												
Deerton-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Loamy sand	SM	A-2-4	0	0-15	95-100	90-100	45-75	10-30	0-14	NP
	6-23	Loamy sand	SM	A-2-4	0	0-15	95-100	90-100	45-75	10-30	0-14	NP
	23-33	Sand	SM	A-2-4	0	0-5	95-100	90-100	45-70	5-15	0-14	NP
	33-55	Weathered bedrock			---	---	---	---	---	---	---	---
	55-80	Unweathered bedrock			---	---	---	---	---	---	---	---
211D:												
Frohling-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Loamy sand, fine sandy loam	SM	A-2-4	0	0-8	95-100	90-100	55-85	15-50	0-20	NP-4
	3-7	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	7-19	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	19-55	Sandy loam, loamy sand	SM	A-2-4, A-4	0	0-8	95-100	75-100	40-70	15-40	0-30	NP-9
	55-80	Sandy loam, fine sandy loam	SM	A-2-4, A-4	0	0-8	95-100	75-100	50-70	25-40	0-20	NP-6

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
211D: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
211E: Frohling-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Loamy sand, fine sandy loam	SM	A-2-4	0	0-8	95-100	90-100	55-85	15-50	0-20	NP-4
	3-7	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	7-19	Fine sandy loam, sandy loam	SM	A-4	0	0-8	95-100	90-100	60-85	35-50	0-20	NP-4
	19-55	Sandy loam, loamy sand	SM	A-2-4, A-4	0	0-8	95-100	75-100	40-70	15-40	0-30	NP-9
	55-80	Sandy loam, fine sandy loam	SM	A-2-4, A-4	0	0-8	95-100	75-100	50-70	25-40	0-20	NP-6
Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
212: Markey-----	0-3	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	3-20	Muck	PT	A-8	0	0	---	---	---	---	---	---
	20-80	Sand	SP-SM	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
214D: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Markey-----	0-3	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	3-20	Muck	PT	A-8	0	0	---	---	---	---	---	---
	20-80	Sand	SP-SM	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
214E: Rousseau-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	NP
	1-4	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	4-20	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	20-33	Fine sand	SM	A-2-4	0	0	100	100	75-95	20-35	0-0	NP
	33-66	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
	66-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0-5	100	95-100	50-95	5-35	0-0	NP
Markey-----	0-3	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	3-20	Muck	PT	A-8	0	0	---	---	---	---	---	---
	20-80	Sand	SP-SM	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
215B: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
215B: Alcona-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam	SM, SC-SM, ML	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	3-17	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM, SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	17-23	Very fine sandy loam, loamy fine sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	95-100	90-100	75-90	45-60	20-30	NP-10
	23-54	Loamy fine sand, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM	A-4	0	0	95-100	90-100	50-80	35-50	20-30	NP-10
	54-80	Stratified loamy very fine sand to fine sandy loam to very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	95-100	90-100	65-90	35-60	15-30	NP-10
215D: Wallace-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-10	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	95-100	45-70	5-30	0-14	NP
	10-11	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	11-21	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	21-26	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	26-59	Sand, fine sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	45-70	0-30	0-14	NP
	59-80	Sand, fine sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	95-100	45-70	0-30	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
215D: Alcona-----	0-1	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	1-3	Fine sandy loam	SM, SC-SM, ML	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	3-17	Fine sandy loam, very fine sandy loam, loamy very fine sand	ML, SM, SC-SM	A-4	0	0	95-100	90-100	65-80	35-50	15-25	NP-7
	17-23	Very fine sandy loam, loamy fine sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	95-100	90-100	75-90	45-60	20-30	NP-10
	23-54	Loamy fine sand, fine sandy loam, very fine sandy loam	SC-SM, CL-ML, SM	A-4	0	0	95-100	90-100	50-80	35-50	20-30	NP-10
	54-80	Stratified loamy very fine sand to fine sandy loam to very fine sandy loam	SC-SM, CL-ML, SM, ML	A-4	0	0	95-100	90-100	65-90	35-60	15-30	NP-10
246B: Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-9	Sand	SP, SP-SM	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	9-11	Fine sand, sand	SP, SP-SM, SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	11-20	Sand, fine sand	SP, SM, SP-SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	20-29	Sand, fine sand	SP, SM, SP-SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Sand, fine sand	SP, SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
246D: Garlic-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-9	Sand	SP, SP-SM	A-3	0	0	95-100	90-100	45-70	0-10	0-0	NP
	9-11	Fine sand, sand	SM, SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	11-20	Sand, fine sand	SM, SP, SP-SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	20-29	Sand, fine sand	SP, SM, SP-SM	A-3, A-2-4	0	0	95-100	90-100	45-95	0-35	0-0	NP
	29-80	Sand, fine sand	SP, SM, SP-SM	A-2-4, A-3	0	0	95-100	90-100	45-95	0-35	0-0	NP
286B: Fence-----	0-2	Moderately decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	97-100	85-100	55-90	10-20	NP-7
	5-13	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	97-100	85-100	55-90	10-20	NP-7
	13-23	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	97-100	90-100	70-90	15-25	NP-10
	23-33	Silt loam	ML, CL-ML	A-4	0	0	100	97-100	90-100	70-90	15-25	NP-10
	33-80	Silt loam, very fine sandy loam	ML, CL-ML	A-4	0	0	100	97-100	90-100	70-90	15-25	NP-10
287B: Noseum-----	0-2	Highly decomposed plant material	PT	A-8	0	0	---	---	---	---	---	---
	2-5	Sandy loam, fine sandy loam	SM, SC-SM	A-4	0	0	95-100	95-100	65-85	35-55	0-25	NP-7
	5-7	Sandy loam, fine sandy loam	SM, SC-SM	A-4	0	0	95-100	95-100	65-85	35-55	0-25	NP-7
	7-19	Fine sandy loam, sandy loam	SM, SC-SM	A-4	0	0	95-100	95-100	65-85	35-55	0-25	NP-7
	19-27	Sand	SM	A-3	0	0	95-100	90-100	50-70	5-15	0-14	NP
	27-80	Sand	SM	A-3	0	0	90-100	85-100	45-65	5-15	0-14	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
300: Beaches-----	0-80	Sand	---	---	---	---	---	---	---	---	---	---
W. Water												

Table 16.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
10D: Ontonagon-----	0-7	12-25	1.20-1.35	0.60-2.00	0.21-0.23	0.0-2.9	.37	.37	3	6	48
	7-13	20-65	1.35-1.45	0.20-0.60	0.20-0.22	6.0-8.9	.43	.43			
	13-21	60-85	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	21-32	60-85	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	32-80	60-85	1.48-1.55	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
15B: Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
15D: Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
15E: Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
15F: Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
16B: Graveraet-----	0-1	---	---	---	---	---	---	---	3	3	86
	1-4	2-10	1.40-1.70	0.60-2.00	0.16-0.18	0.0-2.9	.24	.24			
	4-7	2-10	1.40-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	7-10	2-10	1.60-1.85	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	10-17	2-10	1.60-1.85	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	17-33	2-10	1.80-2.10	0.06-0.20	0.03-0.06	0.0-2.9	.17	.17			
	33-48	8-20	1.65-1.75	0.20-2.00	0.12-0.14	0.0-2.9	.37	.37			
	48-68	15-25	1.65-1.75	0.20-2.00	0.12-0.14	0.0-2.9	.37	.37			
	68-80	5-12	1.65-1.80	0.20-2.00	0.08-0.10	0.0-2.9	.28	.28			
17C: Deer Park-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-10	0-10	1.20-1.50	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-21	0-10	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	21-80	0-10	1.50-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
17E:											
Deer Park-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-10	0-10	1.20-1.50	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-21	0-10	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	21-80	0-10	1.50-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
17F:											
Deer Park-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-10	0-10	1.20-1.50	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-21	0-10	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	21-80	0-10	1.50-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
18B:											
Rubicon-----	0-2	---	---	6.00-20.00	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
18D:											
Rubicon-----	0-2	---	---	6.00-20.00	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
18E:											
Rubicon-----	0-2	---	---	6.00-20.00	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
18F:											
Rubicon-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
19B:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
19D:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
19E:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
19F:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
20B:											
Croswell-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-15	0-10	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	15-22	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
	22-80	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
21A:											
Finch-----	0-1	---	---	---	---	---	---	---	2	1	220
	1-11	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	11-42	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	42-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
22:											
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
23:											
Leafriver-----	0-2	---	0.10-0.25	0.20-6.00	0.45-0.55	---	---	---	2	5	56
	2-8	---	0.10-0.25	0.20-6.00	0.35-0.45	---	---	---			
	8-10	1-10	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.17	.17			
	10-80	0-10	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.17	.17			
24B:											
Springlake-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-7	1-7	1.30-1.60	6.00-20.00	0.09-0.12	0.0-2.9	.15	.17			
	7-9	1-7	1.30-1.60	6.00-20.00	0.05-0.11	0.0-2.9	.15	.17			
	9-14	1-6	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.10	.17			
	14-23	1-6	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.10	.17			
	23-26	0-3	1.50-1.65	20.00-99.90	0.02-0.04	0.0-2.9	.10	.15			
	26-80	0-3	1.50-1.65	20.00-99.90	0.02-0.04	0.0-2.9	.10	.15			
29A:											
Solona-----	0-6	5-10	1.20-1.50	0.60-2.00	0.15-0.17	0.0-2.9	.20	.24	5	3	86
	6-18	5-15	1.20-1.50	0.60-2.00	0.15-0.21	0.0-2.9	.20	.24			
	18-25	12-18	1.35-1.60	0.60-2.00	0.11-0.17	0.0-2.9	.17	.24			
	25-80	7-15	1.60-1.80	0.60-2.00	0.10-0.14	0.0-2.9	.17	.28			
30:											
Kinross-----	0-3	---	0.10-0.35	6.00-20.00	0.35-0.45	---	---	---	3	2	134
	3-14	0-5	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	14-22	0-5	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	22-35	0-3	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	35-80	0-1	1.40-1.70	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
31B:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
31D:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
31E:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
31F:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
32A:											
Allendale-----	0-5	1-5	1.25-1.40	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17	4	2	134
	5-8	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	8-10	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	10-31	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	31-35	40-60	1.45-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	35-80	40-60	1.45-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
33:											
Pits											
35:											
Histosols-----	0-51	---	---	0.20-6.00	---	---	---	---	5	8	0
	51-80	---	---	0.01-0.02	---	---	---	---			
Aquents-----	0-80	---	---	---	---	---	---	---	3	---	---
36:											
Carbondale-----	0-38	---	0.20-0.30	0.20-6.00	0.35-0.45	0.0-2.9	---	---	5	8	0
	38-80	---	0.10-0.20	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
Lupton-----	0-4	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	5	8	0
	4-80	---	0.20-0.30	0.20-6.00	0.35-0.45	0.0-2.9	---	---			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
36: Tawas-----	0-26	---	0.20-0.30	0.20-6.00	0.35-0.45	---	---	---	4	8	0
	26-80	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
37: Dawson-----	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Greenwood-----	0-65	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---	5	8	0
	65-80	---	0.13-0.23	0.60-6.00	0.35-0.45	0.0-2.9	---	---			
Loxley-----	0-8	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	5	8	0
	8-80	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
45D: Rubicon-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
45E: Rubicon-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
46B: Kalkaska-----	0-1	---	---	6.00-20.00	---	---	---	---	5	2	134
	1-6	3-8	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	6-8	3-8	1.30-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	8-12	1-8	1.30-1.70	6.00-20.00	0.06-0.11	0.0-2.9	.17	.17			
	12-23	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	23-38	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	38-80	0-5	1.55-1.75	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
46D: Kalkaska-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-6	3-8	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	6-8	3-8	1.30-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	8-12	1-8	1.30-1.70	6.00-20.00	0.06-0.11	0.0-2.9	.17	.17			
	12-23	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	23-38	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	38-80	0-5	1.55-1.75	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
46E: Kalkaska-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-6	3-8	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	6-8	3-8	1.30-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	8-12	1-8	1.30-1.70	6.00-20.00	0.06-0.11	0.0-2.9	.17	.17			
	12-23	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	23-38	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	38-80	0-5	1.55-1.75	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
46F: Kalkaska-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-6	3-8	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	6-8	3-8	1.30-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	8-12	1-8	1.30-1.70	6.00-20.00	0.06-0.11	0.0-2.9	.17	.17			
	12-23	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	23-38	0-5	1.30-1.70	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	38-80	0-5	1.55-1.75	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
47B: Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
47D: Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
53B: Menominee, sandy substratum-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-11	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	11-34	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-46	15-35	1.35-1.70	0.60-2.00	0.15-0.19	0.0-2.9	.32	.32			
	46-62	15-25	1.45-1.75	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32			
	62-80	0-10	1.55-1.70	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
57B: Amadon-----	0-2	---	---	---	---	---	---	---	2	3	86
	2-8	2-10	1.20-1.60	0.60-2.00	0.11-0.18	0.0-2.9	.20	.24			
	8-10	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	10-15	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	15-80	---	---	0.00-0.06	---	---	---	---			
Longrie-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-2	---	---	---	---	---	---	---			
	2-6	2-10	1.10-1.60	0.60-2.00	0.10-0.16	0.0-2.9	.20	.24			
	6-8	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	8-23	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	23-36	2-10	1.35-1.65	0.60-2.00	0.09-0.18	0.0-2.9	.37	.43			
	36-80	---	---	0.00-0.06	---	---	---	---			
Rock outcrop----	0-80	---	---	0.00-0.06	---	---	---	---	-	---	---

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
57D:											
Amadon-----	0-2	---	---	---	---	---	---	---	2	3	86
	2-8	2-10	1.20-1.60	0.60-2.00	0.11-0.18	0.0-2.9	.20	.24			
	8-10	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	10-15	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	15-80	---	---	0.00-0.06	---	---	---	---			
Longrie-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-2	---	---	---	---	---	---	---			
	2-6	2-10	1.10-1.60	0.60-2.00	0.10-0.16	0.0-2.9	.20	.24			
	6-8	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	8-23	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	23-36	2-10	1.35-1.65	0.60-2.00	0.09-0.18	0.0-2.9	.37	.43			
	36-80	---	---	0.00-0.06	---	---	---	---			
Rock outcrop----	0-80	---	---	0.00-0.06	---	---	---	---	-	---	---
57E:											
Amadon-----	0-2	---	---	---	---	---	---	---	2	3	86
	2-8	2-10	1.20-1.60	0.60-2.00	0.11-0.18	0.0-2.9	.20	.24			
	8-10	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	10-15	2-10	1.35-1.65	0.60-2.00	0.10-0.17	0.0-2.9	.20	.24			
	15-80	---	---	0.00-0.06	---	---	---	---			
Longrie-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-2	---	---	---	---	---	---	---			
	2-6	2-10	1.10-1.60	0.60-2.00	0.10-0.16	0.0-2.9	.20	.24			
	6-8	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	8-23	2-10	1.35-1.65	0.60-2.00	0.09-0.19	0.0-2.9	.28	.32			
	23-36	2-10	1.35-1.65	0.60-2.00	0.09-0.18	0.0-2.9	.37	.43			
	36-80	---	---	0.00-0.06	---	---	---	---			
Rock outcrop----	0-80	---	---	0.00-0.06	---	---	---	---	-	---	---
60A:											
Kinross-----	0-3	---	0.10-0.35	6.00-20.00	0.35-0.45	---	---	---	3	2	134
	3-14	0-5	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	14-22	0-5	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	22-35	0-3	1.40-1.70	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	35-80	0-1	1.40-1.70	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Au Gres-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-17	0-10	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	17-28	0-10	1.40-1.65	6.00-20.00	0.06-0.07	0.0-2.9	.15	.15			
	28-80	0-10	1.50-1.65	6.00-20.00	0.05-0.06	0.0-2.9	.15	.15			
61B:											
Paquin-----	0-2	---	---	6.00-20.00	---	---	---	---	2	1	220
	2-12	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	12-14	0-5	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	14-17	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	17-27	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	27-34	0-1	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	34-80	0-1	1.50-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
65B:											
Rubicon, organic surface-----	0-4	---	---	---	---	---	---	---	5	1	220
	4-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
65D: Rubicon, organic surface-----	0-4	---	---	---	---	---	---	---	5	1	220
	4-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
65E: Rubicon, organic surface-----	0-4	---	---	---	---	---	---	---	5	1	220
	4-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
66B: Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Kaks-----	0-4	4-10	1.30-1.60	2.00-6.00	0.13-0.15	0.0-2.9	.24	.24	4	3	86
	4-21	4-10	1.35-1.65	2.00-6.00	0.12-0.14	0.0-2.9	.17	.24			
	21-35	2-6	1.35-1.65	2.00-6.00	0.11-0.14	0.0-2.9	.17	.24			
	35-80	1-6	1.50-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.10	.24			
66D: Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Kaks-----	0-4	4-10	1.30-1.60	2.00-6.00	0.13-0.15	0.0-2.9	.24	.24	4	3	86
	4-21	4-10	1.35-1.65	2.00-6.00	0.12-0.14	0.0-2.9	.17	.24			
	21-35	2-6	1.35-1.65	2.00-6.00	0.11-0.14	0.0-2.9	.17	.24			
	35-80	1-6	1.50-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.10	.24			
66E: Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Kaks-----	0-4	4-10	1.30-1.60	2.00-6.00	0.13-0.15	0.0-2.9	.24	.24	4	3	86
	4-21	4-10	1.35-1.65	2.00-6.00	0.12-0.14	0.0-2.9	.17	.24			
	21-35	2-6	1.35-1.65	2.00-6.00	0.11-0.14	0.0-2.9	.17	.24			
	35-80	1-6	1.50-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.10	.24			
66F: Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
66F:											
Kaks-----	0-4	4-10	1.30-1.60	2.00-6.00	0.13-0.15	0.0-2.9	.24	.24	4	3	86
	4-21	4-10	1.35-1.65	2.00-6.00	0.12-0.14	0.0-2.9	.17	.24			
	21-35	2-6	1.35-1.65	2.00-6.00	0.11-0.14	0.0-2.9	.17	.24			
	35-80	1-6	1.50-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.10	.24			
74B:											
Menominee, sandy substratum-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-11	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	11-34	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-46	15-35	1.35-1.70	0.60-2.00	0.15-0.19	0.0-2.9	.32	.32			
	46-62	15-25	1.45-1.75	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32			
	62-80	0-10	1.55-1.70	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Graveraet-----	0-1	---	---	---	---	---	---	---	3	3	86
	1-4	2-10	1.40-1.70	0.60-2.00	0.16-0.18	0.0-2.9	.24	.24			
	4-7	2-10	1.40-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	7-10	2-10	1.60-1.85	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	10-17	2-10	1.60-1.85	0.60-2.00	0.15-0.17	0.0-2.9	.24	.24			
	17-33	2-10	1.80-2.10	0.06-0.20	0.03-0.06	0.0-2.9	.17	.17			
	33-48	8-20	1.65-1.75	0.20-2.00	0.12-0.14	0.0-2.9	.37	.37			
	48-68	15-25	1.65-1.75	0.20-2.00	0.12-0.14	0.0-2.9	.37	.37			
	68-80	5-12	1.65-1.80	0.20-2.00	0.08-0.10	0.0-2.9	.28	.28			
75D:											
Dillingham-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-8	1-5	1.30-1.60	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	8-11	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	11-21	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	21-31	1-5	1.80-2.10	0.06-0.20	0.03-0.06	0.0-2.9	.17	.17			
	31-80	0-5	1.55-1.75	2.00-6.00	0.02-0.04	0.0-2.9	.17	.17			
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
75E:											
Dillingham-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-8	1-5	1.30-1.60	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	8-11	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	11-21	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	21-31	1-5	1.80-2.10	0.06-0.20	0.03-0.06	0.0-2.9	.17	.17			
	31-80	0-5	1.55-1.75	2.00-6.00	0.02-0.04	0.0-2.9	.17	.17			
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
75F:											
Dillingham-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-8	1-5	1.30-1.60	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	8-11	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	11-21	1-5	1.40-1.70	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17			
	21-31	1-5	1.80-2.10	0.06-0.20	0.03-0.06	0.0-2.9	.17	.17			
	31-80	0-5	1.55-1.75	2.00-6.00	0.02-0.04	0.0-2.9	.17	.17			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
75F:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
76D:											
Menominee, sandy substratum-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-11	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	11-34	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-46	15-35	1.35-1.70	0.60-2.00	0.15-0.19	0.0-2.9	.32	.32			
	46-62	15-25	1.45-1.75	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32			
	62-80	0-10	1.55-1.70	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
76E:											
Menominee, sandy substratum-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-11	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	11-34	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-46	15-35	1.35-1.70	0.60-2.00	0.15-0.19	0.0-2.9	.32	.32			
	46-62	15-25	1.45-1.75	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32			
	62-80	0-10	1.55-1.70	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
84B:											
Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alcona-----	0-1	---	---	---	---	---	---	---	5	3	86
	1-3	2-10	1.30-1.60	0.60-6.00	0.12-0.18	0.0-2.9	.24	.24			
	3-17	2-10	1.30-1.65	0.60-6.00	0.12-0.19	0.0-2.9	.24	.24			
	17-23	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	23-54	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	54-80	5-15	1.50-1.70	0.60-2.00	0.08-0.20	0.0-2.9	.24	.24			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
84D:											
Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alcona-----	0-1	---	---	---	---	---	---	---	5	3	86
	1-3	2-10	1.30-1.60	0.60-6.00	0.12-0.18	0.0-2.9	.24	.24			
	3-17	2-10	1.30-1.65	0.60-6.00	0.12-0.19	0.0-2.9	.24	.24			
	17-23	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	23-54	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	54-80	5-15	1.50-1.70	0.60-2.00	0.08-0.20	0.0-2.9	.24	.24			
84E:											
Liminga-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-7	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-9	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-22	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-31	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alcona-----	0-1	---	---	---	---	---	---	---	5	3	86
	1-3	2-10	1.30-1.60	0.60-6.00	0.12-0.18	0.0-2.9	.24	.24			
	3-17	2-10	1.30-1.65	0.60-6.00	0.12-0.19	0.0-2.9	.24	.24			
	17-23	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	23-54	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	54-80	5-15	1.50-1.70	0.60-2.00	0.08-0.20	0.0-2.9	.24	.24			
85B:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Okeefe-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-6	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	6-7	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-19	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	19-31	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.80	0.60-2.00	0.05-0.20	0.0-2.9	.28	.28			
85D:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Okeefe-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-6	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	6-7	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-19	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	19-31	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.80	0.60-2.00	0.05-0.20	0.0-2.9	.28	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
85E:											
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Okeefe-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-6	0-5	1.30-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	6-7	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-19	0-5	1.30-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	19-31	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	31-80	0-5	1.50-1.80	0.60-2.00	0.05-0.20	0.0-2.9	.28	.28			
88B:											
Croswell-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-15	0-10	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	15-22	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
	22-80	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
Au Gres-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-17	0-10	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	17-28	0-10	1.40-1.65	6.00-20.00	0.06-0.07	0.0-2.9	.15	.15			
	28-80	0-10	1.50-1.65	6.00-20.00	0.05-0.06	0.0-2.9	.15	.15			
89A:											
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-19.98	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Finch-----	0-1	---	---	---	---	---	---	---	2	1	220
	1-11	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	11-42	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	42-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
90D:											
Rousseau-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
90E:											
Rousseau-----	0-1	---	---	6.00-20.00	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
90E:											
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
90F:											
Rousseau-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
91D:											
Rousseau-----	0-1	---	---	6.00-20.00	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
91E:											
Rousseau-----	0-1	---	---	6.00-20.00	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
91F:											
Rousseau-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
93F:											
Ontonagon-----	0-7	12-25	1.20-1.35	0.60-2.00	0.21-0.23	0.0-2.9	.37	.37	3	6	48
	7-13	20-65	1.35-1.45	0.20-0.60	0.20-0.22	6.0-8.9	.43	.43			
	13-21	60-85	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	21-32	60-85	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	32-60	60-85	1.48-1.55	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
Pickford, occasionally flooded-----	0-6	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	6-9	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43			
	9-13	30-50	1.40-1.65	0.00-0.06	0.09-0.13	6.0-8.9	.32	.32			
	13-24	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	24-80	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
94A:											
Tawas -----	0-26	---	0.20-0.30	0.20-6.00	0.35-0.45	---	---	---	4	8	0
	26-80	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
Spot -----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Finch -----	0-1	---	---	---	---	---	---	---	2	1	220
	1-11	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	11-42	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	42-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
102:											
Spot -----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Dawson -----	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
104B:											
Pence -----	0-1	---	---	---	---	---	---	---	4	3	86
	1-5	2-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	5-6	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	6-13	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	13-20	2-7	1.35-1.70	0.60-2.00	0.14-0.17	0.0-2.9	.37	.37			
	20-27	0-3	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.10	.15			
	27-80	0-3	1.50-1.65	6.00-20.00	0.03-0.05	0.0-2.9	.10	.15			
104D:											
Pence -----	0-1	---	---	---	---	---	---	---	4	3	86
	1-5	2-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	5-6	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	6-13	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	13-20	2-7	1.35-1.70	0.60-2.00	0.14-0.17	0.0-2.9	.37	.37			
	20-27	0-3	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.10	.15			
	27-80	0-3	1.50-1.65	6.00-20.00	0.03-0.05	0.0-2.9	.10	.15			
104E:											
Pence -----	0-1	---	---	---	---	---	---	---	4	3	86
	1-5	2-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	5-6	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	6-13	2-7	1.35-1.70	0.60-2.00	0.15-0.22	0.0-2.9	.37	.37			
	13-20	2-7	1.35-1.70	0.60-2.00	0.14-0.17	0.0-2.9	.37	.37			
	20-27	0-3	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.10	.15			
	27-80	0-3	1.50-1.65	6.00-20.00	0.03-0.05	0.0-2.9	.10	.15			
109D:											
Rousseau -----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
109D:											
Dawson-----	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
109F:											
Rousseau-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Dawson-----											
	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
110D:											
Au Gres-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-17	0-10	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	17-28	0-10	1.40-1.65	6.00-20.00	0.06-0.07	0.0-2.9	.15	.15			
	28-80	0-10	1.50-1.65	6.00-20.00	0.05-0.06	0.0-2.9	.15	.15			
Dawson-----											
	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Rubicon-----											
	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
110E:											
Au Gres-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-17	0-10	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	17-28	0-10	1.40-1.65	6.00-20.00	0.06-0.07	0.0-2.9	.15	.15			
	28-80	0-10	1.50-1.65	6.00-20.00	0.05-0.06	0.0-2.9	.15	.15			
Dawson-----											
	0-10	---	0.05-0.15	6.00-20.00	0.55-0.65	0.0-2.9	---	---	4	8	0
	10-19	---	0.10-0.17	0.60-6.00	0.45-0.55	0.0-2.9	---	---			
	19-38	---	0.13-0.23	0.20-6.00	0.35-0.45	0.0-2.9	---	---			
	38-80	0-10	1.50-1.70	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Rubicon-----											
	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-5	1.30-1.55	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	7-32	0-5	1.30-1.60	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	32-40	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
	40-80	0-5	1.50-1.60	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
116:											
Udipsamments----	0-80	0-10	1.35-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	5	1	220
Udorthents-----											
	0-1	---	---	---	---	---	---	---	5	3	86
	1-80	---	---	---	---	---	---	---			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
117D:											
Manistee, sandy substratum-----	0-1	---	---	---	---	---	---	---	4	1	220
	1-10	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-26	0-5	1.30-1.70	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	26-30	35-60	1.37-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	30-36	40-60	1.37-1.70	0.06-0.20	0.08-0.16	6.0-8.9	.32	.32			
	36-64	40-60	1.60-1.75	0.06-0.20	0.08-0.10	6.0-8.9	.32	.32			
	64-80	0-10	1.55-1.75	6.00-20.00	0.08-0.10	0.0-2.9	.17	.17			
120B:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
120D:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			
120E:											
McMillan-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	4-6	3-7	1.30-1.60	0.60-2.00	0.15-0.18	0.0-2.9	.24	.24			
	6-9	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	9-16	3-7	1.35-1.70	0.60-2.00	0.14-0.22	0.0-2.9	.37	.37			
	16-22	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	22-32	1-5	1.40-1.65	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	32-80	1-7	1.55-1.75	6.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
Trenary-----	0-2	2-10	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.20	.24	5	3	86
	2-6	2-8	1.35-1.60	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	6-12	2-8	1.35-1.65	0.60-2.00	0.14-0.24	0.0-2.9	.20	.24			
	12-17	4-12	1.35-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.20	.24			
	17-26	4-10	1.35-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.20	.24			
	26-37	15-27	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.28	.32			
	37-80	5-14	1.55-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.20	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
122: Pits, quarry----	0-80	---	---	0.01-20.00	---	---	---	---	-	---	---
126: Pickford-----	0-6	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	6-9	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43			
	9-13	30-50	1.40-1.65	0.00-0.06	0.09-0.13	6.0-8.9	.32	.32			
	13-24	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	24-80	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
129A: Rudyard-----	0-5	15-25	1.00-1.30	0.60-2.00	0.21-0.23	0.0-2.9	.37	.37	3	5	56
	5-8	20-40	1.20-1.40	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	8-22	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	22-29	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	29-80	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
130A: Rudyard-----	0-5	15-25	1.00-1.30	0.60-2.00	0.21-0.23	0.0-2.9	.37	.37	3	5	56
	5-8	20-40	1.20-1.40	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	8-22	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	22-29	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
	29-80	60-70	1.35-1.45	0.00-0.06	0.11-0.13	6.0-8.9	.28	.28			
Pickford-----	0-6	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	6-9	20-40	1.10-1.35	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43			
	9-13	30-50	1.40-1.65	0.00-0.06	0.09-0.13	6.0-8.9	.32	.32			
	13-24	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	24-80	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
132B: Sugar-----	0-1	---	---	---	---	---	---	---	4	3	86
	1-4	2-10	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32			
	4-11	2-10	1.35-1.60	0.60-2.00	0.17-0.22	0.0-2.9	.32	.32			
	11-20	2-10	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24			
	20-27	2-10	1.35-1.60	0.60-2.00	0.17-0.22	0.0-2.9	.32	.32			
	27-35	12-18	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32			
	35-46	35-60	1.60-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	46-80	40-70	1.60-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
133: Dorval-----	0-12	---	0.13-0.42	0.20-6.00	0.35-0.55	---	---	---	5	2	134
	12-19	---	0.13-0.42	0.20-6.00	0.35-0.55	---	---	---			
	19-23	---	0.13-0.42	0.20-6.00	0.35-0.55	---	---	---			
	23-33	35-60	1.40-1.65	0.00-0.06	0.10-0.20	6.0-8.9	.32	.32			
	33-80	35-60	1.40-1.65	0.00-0.06	0.10-0.20	6.0-8.9	.32	.32			
143: Caffey-----	0-6	---	0.30-0.40	0.20-6.00	0.35-0.45	0.0-2.9	---	---	5	2	134
	6-12	0-5	1.40-1.55	2.00-20.00	0.06-0.09	0.0-2.9	.17	.17			
	12-21	0-5	1.40-1.55	2.00-20.00	0.06-0.09	0.0-2.9	.17	.17			
	21-35	2-8	1.50-1.80	0.20-0.60	0.10-0.20	0.0-2.9	.43	.43			
	35-80	2-8	1.50-1.80	0.20-0.60	0.10-0.20	0.0-2.9	.43	.43			
146A: Allendale-----	0-5	1-5	1.25-1.40	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17	4	2	134
	5-8	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	8-10	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	10-31	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	31-35	40-60	1.45-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
	35-80	40-60	1.45-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
146A:											
Fibre-----	0-5	---	0.30-0.45	0.20-6.00	0.35-0.45	---	---	---	3	2	134
	5-13	0-5	1.35-1.50	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-17	0-5	1.35-1.50	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	17-19	5-15	1.40-1.65	2.00-20.00	0.09-0.17	0.0-2.9	.20	.20			
	19-27	40-70	1.50-1.70	0.00-0.06	0.09-0.20	6.0-8.9	.28	.28			
	27-80	40-70	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.28	.28			
167D:											
Battydoe-----	0-1	---	---	---	---	---	---	---	5	3	86
	1-3	2-10	0.90-1.25	0.60-2.00	0.13-0.18	0.0-2.9	.24	.24			
	3-5	2-10	1.25-1.50	0.60-2.00	0.07-0.17	0.0-2.9	.24	.24			
	5-11	2-10	0.90-1.25	0.60-2.00	0.09-0.17	0.0-2.9	.24	.24			
	11-20	2-10	1.10-1.50	0.60-2.00	0.07-0.17	0.0-2.9	.24	.24			
	20-28	4-12	1.45-1.75	0.60-2.00	0.07-0.16	0.0-2.9	.24	.28			
	28-80	4-12	1.45-1.75	0.60-2.00	0.07-0.16	0.0-2.9	.24	.28			
Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
173B:											
Paquin-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-12	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	12-14	0-5	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	14-17	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	17-27	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	27-34	0-1	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	34-80	0-1	1.50-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
Finch-----	0-1	---	---	---	---	---	---	---	2	1	220
	1-11	0-3	1.20-1.57	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	11-42	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	42-80	0-5	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
174B:											
Croswell-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-15	0-10	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	15-22	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
	22-80	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
175D:											
Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
175D: Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
175E: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
176B: Paquin-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-12	0-5	1.35-1.45	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	12-14	0-5	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	14-17	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	17-27	0-3	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	27-34	0-1	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	34-80	0-1	1.50-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
Spot-----	0-2	---	0.05-0.15	0.20-6.00	0.55-0.65	0.0-2.9	---	---	2	7	38
	2-8	0-10	1.45-1.70	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	8-10	0-10	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	10-18	0-10	1.45-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	18-80	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
179B: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
179D: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
179E: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
179F:											
Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
180B:											
Millecoquins----	0-2	6-12	1.35-1.55	0.60-2.00	0.18-0.24	0.0-2.9	.28	.28	5	3	86
	2-4	6-12	1.35-1.55	0.60-2.00	0.18-0.24	0.0-2.9	.28	.28			
	4-5	6-12	1.35-1.55	0.60-2.00	0.18-0.24	0.0-2.9	.28	.28			
	5-12	6-12	1.40-1.70	0.60-2.00	0.16-0.20	0.0-2.9	.43	.43			
	12-25	18-35	1.40-1.70	0.20-0.60	0.18-0.22	0.0-2.9	.43	.43			
	25-31	18-35	1.40-1.70	0.20-0.60	0.18-0.22	0.0-2.9	.43	.43			
	31-55	18-35	1.30-1.65	0.20-0.60	0.17-0.20	0.0-2.9	.43	.43			
	55-80	10-20	1.45-1.75	0.20-0.60	0.17-0.20	0.0-2.9	.43	.43			
186D:											
Sporley-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-8	1-10	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.37	.37			
	8-11	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.43	.43			
	11-16	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.24	.24			
	16-22	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	22-45	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	45-80	5-15	1.35-1.70	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
186E:											
Sporley-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-8	1-10	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.37	.37			
	8-11	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.43	.43			
	11-16	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.24	.24			
	16-22	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	22-45	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	45-80	5-15	1.35-1.70	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
186F:											
Sporley-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-8	1-10	1.35-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.37	.37			
	8-11	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.43	.43			
	11-16	1-10	1.40-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.24	.24			
	16-22	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	22-45	5-15	1.55-1.80	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	45-80	5-15	1.35-1.70	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
187B:											
Auger-----	0-2	---	---	---	---	---	---	---	5	5	56
	2-5	1-5	1.30-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37			
	5-6	0-3	1.35-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	6-15	0-3	1.35-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	15-25	0-3	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	25-80	0-3	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
188:											
Hendrie-----	0-4	---	---	0.20-6.00	0.45-0.55	---	---	---	5	5	56
	4-7	2-10	1.10-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.37	.37			
	7-16	2-10	1.35-1.70	0.60-2.00	0.11-0.22	0.0-2.9	.37	.37			
	16-80	2-10	1.45-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
189A:											
Bodi-----	0-1	---	---	---	---	---	---	---	4	5	56
	1-4	1-8	1.30-1.65	0.60-2.00	0.22-0.24	0.0-2.9	.28	.37			
	4-5	1-8	1.35-1.65	0.60-2.00	0.17-0.22	0.0-2.9	.20	.43			
	5-17	1-5	1.35-1.65	0.60-2.00	0.17-0.22	0.0-2.9	.20	.43			
	17-24	0-3	1.35-1.65	2.00-6.00	0.06-0.11	0.0-2.9	.15	.17			
	24-44	1-10	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.17	.24			
	44-80	1-10	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.15	.20			
Chesbrough-----	0-1	---	---	---	---	---	---	---	3	5	56
	1-2	1-8	1.30-1.60	2.00-6.00	0.20-0.22	0.0-2.9	.37	.37			
	2-4	1-8	1.30-1.60	2.00-6.00	0.20-0.22	0.0-2.9	.43	.43			
	4-10	1-8	1.35-1.60	2.00-6.00	0.17-0.19	0.0-2.9	.43	.43			
	10-12	0-5	1.35-1.60	2.00-6.00	0.09-0.11	0.0-2.9	.10	.10			
	12-16	2-10	1.50-1.85	0.60-2.00	0.10-0.12	0.0-2.9	.24	.24			
	16-22	2-10	1.80-2.10	0.00-0.06	0.04-0.08	0.0-2.9	.28	.28			
	22-30	2-10	1.75-2.05	0.60-2.00	0.07-0.10	0.0-2.9	.24	.24			
	30-80	2-8	1.75-2.05	0.60-2.00	0.07-0.10	0.0-2.9	.28	.28			
190B:											
Bodi-----	0-1	---	---	---	---	---	---	---	4	5	56
	1-4	1-8	1.30-1.65	0.60-2.00	0.22-0.24	0.0-2.9	.28	.37			
	4-5	1-8	1.35-1.65	0.60-2.00	0.17-0.22	0.0-2.9	.20	.43			
	5-17	1-5	1.35-1.65	0.60-2.00	0.17-0.22	0.0-2.9	.20	.43			
	17-24	0-3	1.35-1.65	2.00-6.00	0.06-0.11	0.0-2.9	.15	.17			
	24-44	1-10	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.17	.24			
	44-80	1-10	1.80-2.10	0.00-0.06	0.02-0.04	---	.15	.20			
191D:											
Widgeon-----	0-2	---	---	---	---	---	---	---	5	3	86
	2-5	2-8	1.30-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.28	.28			
	5-9	2-8	1.30-1.60	0.60-2.00	0.17-0.22	0.0-2.9	.37	.37			
	9-12	2-8	1.35-1.70	0.60-2.00	0.18-0.22	0.0-2.9	.43	.43			
	12-16	2-8	1.35-1.70	0.60-2.00	0.17-0.22	0.0-2.9	.43	.43			
	16-32	5-35	1.40-1.70	0.20-0.60	0.10-0.20	0.0-2.9	.43	.43			
	32-80	5-35	1.45-1.75	0.20-0.60	0.07-0.20	0.0-2.9	.43	.43			
Kalkaska-----	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
193A:											
Annanias-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-7	1-5	1.30-1.60	2.00-6.00	0.20-0.24	0.0-2.9	.37	.37			
	7-10	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	10-15	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	15-26	0-5	1.35-1.70	2.00-6.00	0.11-0.15	0.0-2.9	.24	.24			
	26-47	0-5	1.40-1.70	2.00-6.00	0.11-0.18	0.0-2.9	.24	.24			
	47-80	0-5	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
194A:											
Hendrie-----	0-4	---	---	0.20-6.00	0.45-0.55	---	---	---	5	5	56
	4-7	2-10	1.10-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.37	.37			
	7-16	2-10	1.35-1.70	0.60-2.00	0.11-0.22	0.0-2.9	.37	.37			
	16-80	2-10	1.45-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
194A:											
Annanias-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-7	1-5	1.30-1.60	2.00-6.00	0.20-0.24	0.0-2.9	.37	.37			
	7-10	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	10-15	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	15-26	0-5	1.35-1.70	2.00-6.00	0.11-0.15	0.0-2.9	.24	.24			
	26-47	0-5	1.40-1.70	2.00-6.00	0.11-0.18	0.0-2.9	.24	.24			
	47-80	0-5	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
195A:											
Chesbrough-----	0-1	---	---	---	---	---	---	---	3	5	56
	1-2	1-8	1.30-1.60	2.00-6.00	0.20-0.22	0.0-2.9	.37	.37			
	2-4	1-8	1.30-1.60	2.00-6.00	0.20-0.22	0.0-2.9	.43	.43			
	4-10	1-8	1.35-1.60	2.00-6.00	0.17-0.19	0.0-2.9	.43	.43			
	10-12	0-5	1.35-1.60	2.00-6.00	0.09-0.11	0.0-2.9	.10	.10			
	12-16	2-10	1.50-1.85	0.60-2.00	0.10-0.12	0.0-2.9	.24	.24			
	16-22	2-10	1.80-2.10	0.00-0.06	0.04-0.08	0.0-2.9	.28	.28			
	22-30	2-10	1.75-2.05	0.60-2.00	0.07-0.10	0.0-2.9	.24	.24			
	30-80	2-8	1.75-2.05	0.60-2.00	0.07-0.10	0.0-2.9	.28	.28			
197D:											
Zandi-----	0-2	---	---	---	---	---	---	---	5	5	56
	2-6	1-5	1.35-1.70	0.60-2.00	0.20-0.24	0.0-2.9	.20	.20			
	6-7	1-5	1.35-1.70	0.60-2.00	0.17-0.19	0.0-2.9	.17	.17			
	7-12	1-5	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.15	.15			
	12-22	1-5	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.15	.15			
	22-37	1-5	1.35-1.70	0.60-2.00	0.08-0.12	0.0-2.9	.15	.15			
	37-80	1-5	1.35-1.70	0.60-2.00	0.08-0.10	0.0-2.9	.15	.15			
197E:											
Zandi-----	0-2	---	---	---	---	---	---	---	5	5	56
	2-6	1-5	1.35-1.70	0.60-2.00	0.20-0.24	0.0-2.9	.20	.20			
	6-7	1-5	1.35-1.70	0.60-2.00	0.17-0.19	0.0-2.9	.17	.17			
	7-12	1-5	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.15	.15			
	12-22	1-5	1.35-1.70	0.60-2.00	0.15-0.17	0.0-2.9	.15	.15			
	22-37	1-5	1.35-1.70	0.60-2.00	0.08-0.12	0.0-2.9	.15	.15			
	37-80	1-5	1.35-1.70	0.60-2.00	0.08-0.10	0.0-2.9	.15	.15			
198B:											
Vilas-----	0-3	2-5	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17	5	2	134
	3-5	0-4	1.35-1.65	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	5-9	2-5	1.50-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	9-20	0-3	1.50-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	20-80	0-1	1.50-1.65	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
198D:											
Vilas-----	0-3	2-5	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17	5	2	134
	3-5	0-4	1.35-1.65	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	5-9	2-5	1.50-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	9-20	0-3	1.50-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	20-80	0-1	1.50-1.65	6.00-20.00	0.02-0.07	0.0-2.9	.15	.15			
199B:											
Auger-----	0-2	---	---	---	---	---	---	---	5	5	56
	2-5	1-5	1.30-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37			
	5-6	0-3	1.35-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	6-15	0-3	1.35-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	15-25	0-3	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	25-80	0-3	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
199B:											
Annanias-----	0-4	---	---	---	---	---	---	---	5	5	56
	4-7	1-5	1.30-1.60	2.00-6.00	0.20-0.24	0.0-2.9	.37	.37			
	7-10	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	10-15	0-5	1.35-1.70	2.00-6.00	0.11-0.22	0.0-2.9	.37	.37			
	15-26	0-5	1.35-1.70	2.00-6.00	0.11-0.15	0.0-2.9	.24	.24			
	26-47	0-5	1.40-1.70	2.00-6.00	0.11-0.18	0.0-2.9	.24	.24			
	47-80	0-5	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
200B:											
Pence-----	0-1	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17	3	3	86
	1-4	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	6-17	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	17-28	0-5	1.65-1.75	6.00-20.00	0.05-0.08	0.0-2.9	.10	.10			
	28-80	0-5	1.35-1.80	6.00-20.00	0.02-0.05	0.0-2.9	.10	.10			
200D:											
Pence-----	0-1	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17	3	3	86
	1-4	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	6-17	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	17-28	0-5	1.65-1.75	6.00-20.00	0.05-0.08	0.0-2.9	.10	.10			
	28-80	0-5	1.35-1.80	6.00-20.00	0.02-0.05	0.0-2.9	.10	.10			
200E:											
Pence-----	0-1	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17	3	3	86
	1-4	2-10	1.35-1.65	0.60-6.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	6-17	2-10	1.35-1.45	0.60-6.00	0.10-0.15	0.0-2.9	.24	.24			
	17-28	0-5	1.65-1.75	6.00-20.00	0.05-0.08	0.0-2.9	.10	.10			
	28-80	0-5	1.35-1.80	6.00-20.00	0.02-0.05	0.0-2.9	.10	.10			
201B:											
Crowell, rarely flooded-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-15	0-10	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	15-22	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
	22-80	0-10	1.55-1.65	6.00-20.00	0.04-0.07	0.0-2.9	.15	.15			
Deford, frequently flooded-----	0-5	---	0.20-0.30	0.20-20.00	0.35-0.45	---	---	---	5	1	250
	5-32	0-10	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	32-80	0-10	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
202B:											
Whitewash-----	0-3	---	---	---	---	---	---	---	5	1	220
	3-7	0-10	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	7-9	5-15	1.35-1.70	0.60-6.00	0.14-0.20	0.0-2.9	.24	.24			
	9-80	0-5	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
203D:											
Frohling-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-3	2-8	1.30-1.65	0.60-2.00	0.10-0.18	0.0-2.9	.20	.24			
	3-7	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	7-19	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	19-55	3-12	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.20	.24			
	55-80	3-12	1.55-1.75	0.60-2.00	0.02-0.04	0.0-2.9	.24	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
203E: Frohling-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-3	2-8	1.30-1.65	0.60-2.00	0.10-0.18	0.0-2.9	.20	.24			
	3-7	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	7-19	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	19-55	3-12	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.20	.24			
	55-80	3-12	1.55-1.75	0.60-2.00	0.02-0.04	0.0-2.9	.24	.28			
204: Gogomain-----	0-6	---	---	0.20-6.00	0.35-0.45	---	---	---	5	3	86
	6-10	2-10	1.25-1.50	2.00-6.00	0.20-0.24	0.0-2.9	.37	.37			
	10-29	2-10	1.35-1.65	2.00-6.00	0.10-0.22	0.0-2.9	.28	.28			
	29-37	2-10	1.35-1.65	2.00-6.00	0.10-0.22	0.0-2.9	.28	.28			
	37-80	40-60	1.50-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
205B: Kalkaska, burned	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
205D: Kalkaska, burned	0-2	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-6	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-8	0-10	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-16	0-10	1.40-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-26	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
206B: Deerton-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-6	1-5	1.30-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.17	.17			
	6-23	1-5	1.30-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.17	.17			
	23-33	1-5	1.45-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-55	---	---	0.60-2.00	---	---	---	---			
	55-80	---	---	0.00-0.20	---	---	---	---			
211D: Frohling-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-3	2-8	1.30-1.65	0.60-2.00	0.10-0.18	0.0-2.9	.20	.24			
	3-7	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	7-19	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	19-55	3-12	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.20	.24			
	55-80	3-12	1.55-1.75	0.60-2.00	0.02-0.04	0.0-2.9	.24	.28			
Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
211E: Frohling-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-3	2-8	1.30-1.65	0.60-2.00	0.10-0.18	0.0-2.9	.20	.24			
	3-7	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	7-19	2-8	1.35-1.65	0.60-2.00	0.09-0.17	0.0-2.9	.20	.24			
	19-55	3-12	1.80-2.10	0.00-0.06	0.02-0.04	0.0-2.9	.20	.24			
	55-80	3-12	1.55-1.75	0.60-2.00	0.02-0.04	0.0-2.9	.24	.28			

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	in/hr	In/in	Pct					
211E: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
212: Markey-----	0-3	---	0.10-0.20	0.60-6.00	0.45-0.55	---	---	---	4	2	134
	3-20	---	0.20-0.30	0.20-6.00	0.35-0.45	---	---	---			
	20-80	0-5	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
214D: Rousseau-----	0-1	---	---	---	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Markey-----	0-3	---	0.10-0.20	0.60-6.00	0.45-0.55	---	---	---	4	2	134
	3-20	---	0.20-0.30	0.20-6.00	0.35-0.45	---	---	---			
	20-80	0-5	1.40-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
214E: Rousseau-----	0-1	---	---	6.00-20.00	---	---	---	---	5	1	250
	1-4	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-20	0-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	20-33	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-66	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	66-80	0-10	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Markey-----	0-3	---	0.10-0.20	0.60-6.00	0.45-0.55	---	---	---	4	2	134
	3-20	---	0.20-0.30	0.20-6.00	0.35-0.45	---	---	---			
	20-80	0-5	1.40-1.65	5.98-20.00	0.05-0.08	0.0-2.9	.15	.15			
215B: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Alcona-----	0-1	---	---	---	---	---	---	---	5	3	86
	1-3	2-10	1.30-1.60	0.60-6.00	0.12-0.18	0.0-2.9	.24	.24			
	3-17	2-10	1.30-1.65	0.60-6.00	0.12-0.19	0.0-2.9	.24	.24			
	17-23	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	23-54	5-15	1.35-1.70	0.60-2.00	0.13-0.20	0.0-2.9	.24	.24			
	54-80	5-15	1.50-1.70	0.60-2.00	0.08-0.20	0.0-2.9	.24	.24			
215D: Wallace-----	0-2	---	---	---	---	---	---	---	2	1	220
	2-10	0-5	1.35-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	10-11	0-5	1.45-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	11-21	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	21-26	0-5	1.65-1.80	0.60-6.00	0.02-0.04	0.0-2.9	.15	.15			
	26-59	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	59-80	0-5	1.45-1.60	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 17.--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	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
10D: Ontonagon-----	0-7	4.5-6.5	2.0-5.0	10-20	---	0
	7-13	4.5-6.5	0.0-0.5	10-25	---	0
	13-21	4.5-7.3	0.0-0.5	25-50	---	0-5
	21-32	6.1-7.8	0.0-0.5	25-50	---	0-5
	32-80	7.4-8.4	0.0-0.5	25-50	---	0-25
15B: Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
15D: Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
15E: Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
15F: Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
16B: Graveraet-----	0-1	4.0-5.5	50-90	---	---	---
	1-4	4.5-6.0	2.0-5.0	---	8.0-9.0	---
	4-7	4.5-6.0	0.5-2.0	---	3.0-4.0	---
	7-10	4.5-6.5	2.0-5.0	---	8.0-9.0	---
	10-17	4.5-6.5	0.5-3.0	---	8.0-9.0	---
	17-33	5.1-6.5	0.0-0.5	1.0-3.0	---	---
	33-48	5.1-7.2	0.0-0.5	8.0-12	---	---
	48-68	5.1-7.2	0.0-0.5	8.0-12	---	---
	68-80	7.2-8.0	0.0-0.5	3.0-4.0	---	10-30
17C: Deer Park-----	0-2	3.5-6.0	50-90	---	---	---
	2-3	3.5-6.0	2.0-5.0	---	2.5-4.2	0
	3-10	3.5-6.0	0.5-2.0	---	0.0-1.4	0
	10-21	3.5-6.5	0.5-3.0	---	0.0-1.4	0
	21-80	3.5-6.5	0.0-0.5	---	0.0-1.4	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
17E:						
Deer Park-----	0-2	3.5-6.0	50-90	---	---	---
	2-3	3.5-6.0	2.0-5.0	---	2.5-4.2	0
	3-10	3.5-6.0	0.5-2.0	---	0.0-1.4	0
	10-21	3.5-6.5	0.5-3.0	---	0.0-1.4	0
	21-80	3.5-6.5	0.0-0.5	---	0.0-1.4	0
17F:						
Deer Park-----	0-2	3.5-6.0	50-90	---	---	---
	2-3	3.5-6.0	2.0-5.0	---	2.5-4.2	0
	3-10	3.5-6.0	0.5-2.0	---	0.0-1.4	0
	10-21	3.5-6.5	0.5-3.0	---	0.0-1.4	0
	21-80	3.5-6.5	0.0-0.5	---	0.0-1.4	0
18B:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
18D:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
18E:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
18F:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
19B:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
19D:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
19E:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
19F:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
20B:						
Croswell-----	0-2	4.5-5.0	50-90	---	---	---
	2-6	3.5-6.0	0.1-1.0	---	0.2-7.0	0
	6-15	4.5-6.0	0.5-3.0	---	1.0-12	0
	15-22	5.1-6.5	0.0-0.5	0.0-7.0	---	0
	22-80	5.1-6.5	0.0-0.5	0.0-7.0	---	0
21A:						
Finch-----	0-1	3.5-5.6	50-90	---	---	---
	1-11	3.5-6.0	0.5-2.0	---	0.0-4.0	---
	11-42	3.5-6.0	0.5-3.0	---	2.0-8.0	---
	42-80	5.1-6.5	0.0-0.5	0.0-1.0	---	---
22:						
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
23:						
Leafriver-----	0-2	5.6-7.3	50-90	100-180	---	---
	2-8	5.6-7.3	50-90	100-180	---	---
	8-10	6.1-7.3	2.0-5.0	1.0-15	---	---
	10-80	6.1-7.3	0.5-5.0	1.0-15	---	---
24B:						
Springlake-----	0-1	4.0-5.5	50-90	---	---	---
	1-7	5.1-6.0	2.0-5.0	5.0-10	---	---
	7-9	5.1-6.0	0.5-2.0	1.0-15	---	---
	9-14	5.1-6.0	2.0-5.0	2.0-10	---	---
	14-23	5.1-7.3	0.5-3.0	2.0-10	---	---
	23-26	7.4-8.4	0.0-0.5	1.0-2.0	---	10-25
	26-80	7.4-8.4	0.0-0.5	1.0-2.0	---	10-25
29A:						
Solona-----	0-6	6.6-7.8	2.0-5.0	5.0-16	---	0
	6-18	6.6-7.8	0.5-2.0	3.0-16	---	0
	18-25	6.4-7.8	0.0-0.5	4.0-15	---	0
	25-80	7.4-8.4	0.0-0.5	2.0-12	---	10-30

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
30:						
Kinross-----	0-3	3.4-5.0	50-90	---	100-180	0
	3-14	3.6-5.0	0.5-2.0	---	1.0-10	0
	14-22	3.6-6.0	2.0-5.0	---	1.0-10	0
	22-35	3.6-6.0	0.5-3.0	---	1.0-10	0
	35-80	4.5-6.5	0.0-0.5	---	1.0-2.0	0
31B:						
McMillan-----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
31D:						
McMillan-----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
31E:						
McMillan-----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
31F:						
McMillan-----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
32A:						
Allendale-----	0-5	4.5-7.3	2.0-5.0	4.0-20	---	---
	5-8	4.5-7.3	0.5-2.0	1.0-5.0	---	---
	8-10	4.5-7.3	2.0-5.0	1.0-5.0	---	---
	10-31	4.5-7.3	0.5-3.0	1.0-5.0	---	---
	31-35	6.1-8.4	0.0-0.5	8.0-25	---	---
	35-80	6.1-8.4	0.0-0.5	8.0-25	---	---
33.						
Pits						

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
35:						
Histosols-----	0-51	---	50-70	---	---	---
	51-80	---	---	---	---	---
Aquents-----	0-80	---	---	---	---	---
36:						
Carbondale-----	0-38	5.1-7.3	50-90	100-180	---	---
	38-80	5.1-7.3	50-90	100-180	---	---
Lupton-----	0-4	4.5-7.8	50-90	100-180	---	0
	4-80	4.5-7.8	50-90	100-180	---	0
Tawas-----	0-26	4.5-6.5	50-90	---	100-180	0
	26-80	5.1-6.5	0.0-0.5	1.0-2.0	---	0
37:						
Dawson-----	0-10	3.0-4.4	50-90	---	100-180	0
	10-19	3.0-4.4	50-90	---	100-180	0
	19-38	3.0-4.4	50-90	---	100-180	0
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0
Greenwood-----	0-65	3.5-4.4	50-90	---	100-180	0
	65-80	3.5-4.4	50-90	---	100-180	0
Loxley-----	0-8	3.5-4.4	50-90	---	100-180	0
	8-80	3.5-4.4	50-90	---	100-180	0
45D:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
45E:						
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
46B:						
Kalkaska-----	0-1	3.6-5.0	50-90	---	---	---
	1-6	3.6-5.5	0.5-2.0	---	3.0-5.0	0
	6-8	3.6-5.5	2.0-5.0	---	1.0-3.0	0
	8-12	4.5-6.0	0.5-3.0	---	0.5-1.0	0
	12-23	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	23-38	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	38-80	4.5-6.5	0.0-0.5	---	0.1-0.5	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
46D:						
Kalkaska-----	0-1	3.6-5.0	50-90	---	---	---
	1-6	3.6-5.5	0.5-2.0	---	3.0-5.0	0
	6-8	3.6-5.5	2.0-5.0	---	1.0-3.0	0
	8-12	4.5-6.0	0.5-3.0	---	0.5-1.0	0
	12-23	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	23-38	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	38-80	4.5-6.5	0.0-0.5	---	0.1-0.5	0
46E:						
Kalkaska-----	0-1	3.6-5.0	50-90	---	---	---
	1-6	3.6-5.5	0.5-2.0	---	3.0-5.0	0
	6-8	3.6-5.5	2.0-5.0	---	1.0-3.0	0
	8-12	4.5-6.0	0.5-3.0	---	0.5-1.0	0
	12-23	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	23-38	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	38-80	4.5-6.5	0.0-0.5	---	0.1-0.5	0
46F:						
Kalkaska-----	0-1	3.6-5.0	50-90	---	---	---
	1-6	3.6-5.5	0.5-2.0	---	3.0-5.0	0
	6-8	3.6-5.5	2.0-5.0	---	1.0-3.0	0
	8-12	4.5-6.0	0.5-3.0	---	0.5-1.0	0
	12-23	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	23-38	4.5-6.0	0.0-0.5	---	0.1-0.5	0
	38-80	4.5-6.5	0.0-0.5	---	0.1-0.5	0
47B:						
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
47D:						
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
53B:						
Menominee, sandy substratum-----	0-1	4.5-5.5	50-90	---	---	---
	1-8	4.5-5.5	0.5-2.0	---	1.0-5.0	---
	8-11	4.5-5.5	2.0-5.0	---	2.0-9.0	---
	11-34	4.5-6.0	0.5-3.0	---	1.0-5.0	---
	34-46	5.1-7.3	0.0-0.5	10-15	---	---
	46-62	7.3-8.4	0.0-0.5	8.0-12	---	10-30
	62-80	5.6-6.5	0.0-0.5	1.0-5.0	---	---
57B:						
Amadon-----	0-2	4.5-5.5	50-90	---	---	---
	2-8	5.1-6.0	0.5-2.0	5.0-15	---	---
	8-10	5.1-6.0	2.0-5.0	5.0-15	---	---
	10-15	5.1-6.0	0.5-3.0	5.0-15	---	---
	15-80	---	---	---	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
57B:						
Longrie-----	0-1	4.5-5.5	50-90	---	---	---
	1-2	4.5-5.5	50-90	---	---	---
	2-6	5.1-6.0	0.5-2.0	---	3.0-15	0
	6-8	5.1-6.0	2.0-5.0	2.0-10	---	0
	8-23	5.1-6.5	0.5-3.0	2.0-10	---	0
	23-36	6.6-7.8	0.0-0.5	2.0-10	---	0-30
	36-80	---	---	---	---	---
Rock outcrop.						
57D:						
Amadon-----	0-2	4.5-5.5	50-90	---	---	---
	2-8	5.1-6.0	0.5-2.0	5.0-15	---	---
	8-10	5.1-6.0	2.0-5.0	5.0-15	---	---
	10-15	5.1-6.0	0.5-3.0	5.0-15	---	---
	15-80	---	---	---	---	---
Longrie-----	0-1	4.5-5.5	50-90	---	---	---
	1-2	4.5-5.5	50-90	---	---	---
	2-6	5.1-6.0	0.5-2.0	---	3.0-15	0
	6-8	5.1-6.0	2.0-5.0	2.0-10	---	0
	8-23	5.1-6.5	0.5-3.0	2.0-10	---	0
	23-36	6.6-7.8	0.0-0.5	2.0-10	---	0-30
	36-80	---	---	---	---	---
Rock outcrop.						
57E:						
Amadon-----	0-2	4.5-5.5	50-90	---	---	---
	2-8	5.1-6.0	0.5-2.0	5.0-15	---	---
	8-10	5.1-6.0	2.0-5.0	5.0-15	---	---
	10-15	5.1-6.0	0.5-3.0	5.0-15	---	---
	15-80	---	---	---	---	---
Longrie-----	0-1	4.5-5.5	50-90	---	---	---
	1-2	4.5-5.5	50-90	---	---	---
	2-6	5.1-6.0	0.5-2.0	---	3.0-15	0
	6-8	5.1-6.0	2.0-5.0	2.0-10	---	0
	8-23	5.1-6.5	0.5-3.0	2.0-10	---	0
	23-36	6.6-7.8	0.0-0.5	2.0-10	---	0-30
	36-80	---	---	---	---	---
Rock outcrop.						
60A:						
Kinross-----	0-3	3.4-5.0	50-90	---	100-180	0
	3-14	3.6-5.0	0.5-2.0	---	1.0-10	0
	14-22	3.6-6.0	2.0-5.0	---	1.0-10	0
	22-35	3.6-6.0	0.5-3.0	---	1.0-10	0
	35-80	4.5-6.5	0.0-0.5	---	1.0-2.0	0
Au Gres-----	0-2	3.5-4.4	50-90	---	---	---
	2-7	3.5-6.0	0.1-1.0	---	0.2-7.0	---
	7-17	4.5-6.5	0.5-3.0	1.0-12	---	---
	17-28	4.5-6.5	0.0-0.5	---	1.0-7.0	---
	28-80	4.5-6.5	0.0-0.5	---	1.0-7.0	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
61B:						
Paquin-----	0-2	3.5-5.0	50-90	---	---	---
	2-12	3.5-5.5	0.5-2.0	---	3.0-5.0	---
	12-14	3.5-5.5	2.0-5.0	---	1.0-4.0	---
	14-17	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	17-27	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	27-34	4.5-6.0	0.2-1.0	---	1.0-2.0	---
	34-80	4.5-6.5	0.0-0.5	3.0-5.0	---	---
65B:						
Rubicon, organic surface-----	0-4	4.5-5.5	50-90	---	---	---
	4-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
65D:						
Rubicon, organic surface-----	0-4	4.5-5.5	50-90	---	---	---
	4-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
65E:						
Rubicon, organic surface-----	0-4	4.5-5.5	50-90	---	---	---
	4-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
66B:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Kaks-----	0-4	5.6-6.5	2.0-5.0	5.0-15	---	0
	4-21	5.6-6.5	0.5-3.0	2.0-10	---	0
	21-35	5.6-7.3	0.0-0.5	1.0-6.0	---	0
	35-80	6.1-7.3	0.0-0.5	1.0-2.0	---	0
66D:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Kaks-----	0-4	5.6-6.5	2.0-5.0	5.0-15	---	0
	4-21	5.6-6.5	0.5-3.0	2.0-10	---	0
	21-35	5.6-7.3	0.0-0.5	1.0-6.0	---	0
	35-80	6.1-7.3	0.0-0.5	1.0-2.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
66E:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Kaks-----	0-4	5.6-6.5	2.0-5.0	5.0-15	---	0
	4-21	5.6-6.5	0.5-3.0	2.0-10	---	0
	21-35	5.6-7.3	0.0-0.5	1.0-6.0	---	0
	35-80	6.1-7.3	0.0-0.5	1.0-2.0	---	0
66F:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Kaks-----	0-4	5.6-6.5	2.0-5.0	5.0-15	---	0
	4-21	5.6-6.5	0.5-3.0	2.0-10	---	0
	21-35	5.6-7.3	0.0-0.5	1.0-6.0	---	0
	35-80	6.1-7.3	0.0-0.5	1.0-2.0	---	0
74B:						
Menominee, sandy substratum-----	0-1	4.5-5.5	50-90	---	---	---
	1-8	4.5-5.5	0.5-2.0	---	1.0-5.0	---
	8-11	4.5-5.5	2.0-5.0	---	2.0-9.0	---
	11-34	4.5-6.0	0.5-3.0	---	1.0-5.0	---
	34-46	5.1-7.3	0.0-0.5	10-15	---	---
	46-62	7.3-8.4	0.0-0.5	8.0-12	---	10-30
	62-80	5.6-6.5	0.0-0.5	1.0-5.0	---	---
	Graveraet-----	0-1	4.0-5.5	50-90	---	---
1-4	4.5-6.0	2.0-5.0	---	8.0-9.0	---	
4-7	4.5-6.0	0.5-2.0	---	3.0-4.0	---	
7-10	4.5-6.5	2.0-5.0	---	8.0-9.0	---	
10-17	4.5-6.5	0.5-3.0	---	8.0-9.0	---	
17-33	5.1-6.5	0.0-0.5	1.0-3.0	---	---	
33-48	5.1-7.2	0.0-0.5	8.0-12	---	---	
48-68	5.1-7.2	0.0-0.5	8.0-12	---	---	
68-80	7.2-8.0	0.0-0.5	3.0-4.0	---	10-30	
75D:						
Dillingham-----	0-1	3.5-5.0	50-90	---	---	---
	1-8	3.5-5.0	0.5-2.0	---	0.0-1.0	0
	8-11	3.5-5.5	2.0-5.0	---	0.0-1.0	0
	11-21	3.5-5.5	0.5-3.0	---	0.0-1.0	0
	21-31	3.5-5.5	0.0-0.5	---	0.0-1.0	0
	31-80	3.5-5.9	0.0-0.5	---	0.0-0.5	0
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
75E:						
Dillingham-----	0-1	3.5-5.0	50-90	---	---	---
	1-8	3.5-5.0	0.5-2.0	---	0.0-1.0	0
	8-11	3.5-5.5	2.0-5.0	---	0.0-1.0	0
	11-21	3.5-5.5	0.5-3.0	---	0.0-1.0	0
	21-31	3.5-5.5	0.0-0.5	---	0.0-1.0	0
	31-80	3.5-5.9	0.0-0.5	---	0.0-0.5	0
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
75F:						
Dillingham-----	0-1	3.5-5.0	50-90	---	---	---
	1-8	3.5-5.0	0.5-2.0	---	0.0-1.0	0
	8-11	3.5-5.5	2.0-5.0	---	0.0-1.0	0
	11-21	3.5-5.5	0.5-3.0	---	0.0-1.0	0
	21-31	3.5-5.5	0.0-0.5	---	0.0-1.0	0
	31-80	3.5-5.9	0.0-0.5	---	0.0-0.5	0
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
76D:						
Menominee, sandy substratum-----	0-1	4.5-5.5	50-90	---	---	---
	1-8	4.5-5.5	0.5-2.0	---	1.0-5.0	---
	8-11	4.5-5.5	2.0-5.0	---	2.0-9.0	---
	11-34	4.5-6.0	0.5-3.0	---	1.0-5.0	---
	34-46	5.1-7.3	0.0-0.5	10-15	---	---
	46-62	7.3-8.4	0.0-0.5	8.0-12	---	10-30
	62-80	5.6-6.5	0.0-0.5	1.0-5.0	---	---
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
76E:						
Menominee, sandy substratum-----	0-1	4.5-5.5	50-90	---	---	---
	1-8	4.5-5.5	0.5-2.0	---	1.0-5.0	---
	8-11	4.5-5.5	2.0-5.0	---	2.0-9.0	---
	11-34	4.5-6.0	0.5-3.0	---	1.0-5.0	---
	34-46	5.1-7.3	0.0-0.5	10-15	---	---
	46-62	7.3-8.4	0.0-0.5	8.0-12	---	10-30
	62-80	5.6-6.5	0.0-0.5	1.0-5.0	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
76E:						
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
84B:						
Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
Alcona-----	0-1	4.0-5.0	50-90	---	---	---
	1-3	4.0-5.5	0.5-2.0	---	1.0-8.0	---
	3-17	4.0-5.5	0.5-3.0	---	1.0-8.0	---
	17-23	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	23-54	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	54-80	5.1-7.8	0.0-0.5	1.0-8.0	---	---
84D:						
Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
Alcona-----	0-1	4.0-5.0	50-90	---	---	---
	1-3	4.0-5.5	0.5-2.0	---	1.0-8.0	---
	3-17	4.0-5.5	0.5-3.0	---	1.0-8.0	---
	17-23	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	23-54	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	54-80	5.1-7.8	0.0-0.5	1.0-8.0	---	---
84E:						
Liminga-----	0-1	3.5-5.0	50-90	---	---	---
	1-7	3.5-6.0	0.5-2.0	---	3.0-5.0	0
	7-9	3.5-6.0	2.0-5.0	---	4.0-9.0	0
	9-22	3.5-6.0	0.5-3.0	---	3.0-5.0	0
	22-31	3.5-6.0	0.0-0.5	---	3.0-5.0	0
	31-80	3.5-6.5	0.0-0.5	---	0.2-4.0	0
Alcona-----	0-1	4.0-5.0	50-90	---	---	---
	1-3	4.0-5.5	0.5-2.0	---	1.0-8.0	---
	3-17	4.0-5.5	0.5-3.0	---	1.0-8.0	---
	17-23	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	23-54	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	54-80	5.1-7.8	0.0-0.5	1.0-8.0	---	---
85B:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
85B:						
Okeefe-----	0-2	3.5-5.5	50-90	---	---	---
	2-6	3.5-5.5	0.5-2.0	---	1.0-5.0	---
	6-7	3.5-5.5	2.0-5.0	---	1.0-5.0	---
	7-19	3.5-5.5	0.5-3.0	---	1.0-5.0	---
	19-31	3.5-5.5	0.0-0.5	---	1.0-5.0	---
	31-80	4.5-5.5	0.0-0.5	---	6.0-22	---
85D:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Okeefe-----	0-2	3.5-5.5	50-90	---	---	---
	2-6	3.5-5.5	0.5-2.0	---	1.0-5.0	---
	6-7	3.5-5.5	2.0-5.0	---	1.0-5.0	---
	7-19	3.5-5.5	0.5-3.0	---	1.0-5.0	---
	19-31	3.5-5.5	0.0-0.5	---	1.0-5.0	---
	31-80	4.5-5.5	0.0-0.5	---	6.0-22	---
85E:						
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
Okeefe-----	0-2	3.5-5.5	50-90	---	---	---
	2-6	3.5-5.5	0.5-2.0	---	1.0-5.0	---
	6-7	3.5-5.5	2.0-5.0	---	1.0-5.0	---
	7-19	3.5-5.5	0.5-3.0	---	1.0-5.0	---
	19-31	3.5-5.5	0.0-0.5	---	1.0-5.0	---
	31-80	4.5-5.5	0.0-0.5	---	6.0-22	---
88B:						
Croswell-----	0-2	4.5-5.0	50-90	---	---	---
	2-6	3.5-6.0	0.1-1.0	---	0.2-7.0	0
	6-15	4.5-6.0	0.5-3.0	---	1.0-12	0
	15-22	5.1-6.5	0.0-0.5	0.0-7.0	---	0
	22-80	5.1-6.5	0.0-0.5	0.0-7.0	---	0
Au Gres-----	0-2	3.5-4.4	50-90	---	---	---
	2-7	3.5-6.0	0.1-1.0	---	0.2-7.0	---
	7-17	4.5-6.5	0.5-3.0	1.0-12	---	---
	17-28	4.5-6.5	0.0-0.5	---	1.0-7.0	---
	28-80	4.5-6.5	0.0-0.5	---	1.0-7.0	---
89A:						
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
Finch-----	0-1	3.5-5.6	50-90	---	---	---
	1-11	3.5-6.0	0.5-2.0	---	0.0-4.0	---
	11-42	3.5-6.0	0.5-3.0	---	2.0-8.0	---
	42-80	5.1-6.5	0.0-0.5	0.0-1.0	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
90D:						
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	90E:					
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	90F:					
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Spot-----	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	91D:					
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
91E:						
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct	
91F:							
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0	
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0	
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0	
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0	
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0	
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0	
93F:							
Ontonagon-----	0-7	4.5-6.5	2.0-5.0	10-20	---	0	
	7-13	4.5-6.5	0.0-0.5	10-25	---	0	
	13-21	4.5-7.3	0.0-0.5	25-50	---	0-5	
	21-32	6.1-7.8	0.0-0.5	25-50	---	0-5	
	32-60	7.4-8.4	0.0-0.5	25-50	---	0-25	
Pickford, occasionally flooded-----							
	0-6	5.1-7.8	3.0-15	10-45	---	0	
	6-9	5.1-7.8	1.0-3.0	10-45	---	0	
	9-13	5.1-7.8	0.0-0.5	20-30	---	0-10	
	13-24	6.6-7.8	0.0-0.5	15-30	---	10-30	
	24-80	7.4-8.4	0.0-0.5	15-30	---	10-30	
94A:							
Tawas-----	0-26	4.5-6.5	50-90	---	100-180	0	
	26-80	5.1-6.5	0.0-0.5	1.0-2.0	---	0	
Spot-----							
	0-2	3.5-5.5	50-90	---	100-180	---	
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0	
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0	
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0	
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0	
Finch-----							
	0-1	3.5-5.6	50-90	---	---	---	
	1-11	3.5-6.0	0.5-2.0	---	0.0-4.0	---	
	11-42	3.5-6.0	0.5-3.0	---	2.0-8.0	---	
	42-80	5.1-6.5	0.0-0.5	0.0-1.0	---	---	
102:							
Spot-----							
	0-2	3.5-5.5	50-90	---	100-180	---	
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0	
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0	
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0	
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0	
Dawson-----							
	0-10	3.0-4.4	50-90	---	100-180	0	
	10-19	3.0-4.4	50-90	---	100-180	0	
	19-38	3.0-4.4	50-90	---	100-180	0	
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0	
104B:							
Pence-----							
	0-1	3.5-5.5	50-90	---	---	---	
	1-5	3.5-6.0	0.5-2.0	---	1.0-5.0	---	
	5-6	3.5-6.0	2.0-5.0	---	2.0-9.0	---	
	6-13	3.5-6.0	0.5-3.0	---	2.0-9.0	---	
	13-20	3.5-6.0	0.5-3.0	---	2.0-9.0	---	
	20-27	3.5-6.5	0.0-0.5	---	1.0-4.0	---	
	27-80	3.5-6.5	0.0-0.5	---	1.0-4.0	---	

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
104D:						
Pence-----	0-1	3.5-5.5	50-90	---	---	---
	1-5	3.5-6.0	0.5-2.0	---	1.0-5.0	---
	5-6	3.5-6.0	2.0-5.0	---	2.0-9.0	---
	6-13	3.5-6.0	0.5-3.0	---	2.0-9.0	---
	13-20	3.5-6.0	0.5-3.0	---	2.0-9.0	---
	20-27	3.5-6.5	0.0-0.5	---	1.0-4.0	---
	27-80	3.5-6.5	0.0-0.5	---	1.0-4.0	---
104E:						
Pence-----	0-1	3.5-5.5	50-90	---	---	---
	1-5	3.5-6.0	0.5-2.0	---	1.0-5.0	---
	5-6	3.5-6.0	2.0-5.0	---	2.0-9.0	---
	6-13	3.5-6.0	0.5-3.0	---	2.0-9.0	---
	13-20	3.5-6.0	0.5-3.0	---	2.0-9.0	---
	20-27	3.5-6.5	0.0-0.5	---	1.0-4.0	---
	27-80	3.5-6.5	0.0-0.5	---	1.0-4.0	---
109D:						
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Dawson-----	0-10	3.0-4.4	50-90	---	100-180	0
	10-19	3.0-4.4	50-90	---	100-180	0
	19-38	3.0-4.4	50-90	---	100-180	0
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0
109F:						
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Dawson-----	0-10	3.0-4.4	50-90	---	100-180	0
	10-19	3.0-4.4	50-90	---	100-180	0
	19-38	3.0-4.4	50-90	---	100-180	0
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0
110D:						
Au Gres-----	0-2	3.5-4.4	50-90	---	---	---
	2-7	3.5-6.0	0.1-1.0	---	0.2-7.0	---
	7-17	4.5-6.5	0.5-3.0	1.0-12	---	---
	17-28	4.5-6.5	0.0-0.5	---	1.0-7.0	---
	28-80	4.5-6.5	0.0-0.5	---	1.0-7.0	---
Dawson-----	0-10	3.0-4.4	50-90	---	100-180	0
	10-19	3.0-4.4	50-90	---	100-180	0
	19-38	3.0-4.4	50-90	---	100-180	0
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0
Rubicon-----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
110E:						
Au Gres -----	0-2	3.5-4.4	50-90	---	---	---
	2-7	3.5-6.0	0.1-1.0	---	0.2-7.0	---
	7-17	4.5-6.5	0.5-3.0	1.0-12	---	---
	17-28	4.5-6.5	0.0-0.5	---	1.0-7.0	---
	28-80	4.5-6.5	0.0-0.5	---	1.0-7.0	---
Dawson -----	0-10	3.0-4.4	50-90	---	100-180	0
	10-19	3.0-4.4	50-90	---	100-180	0
	19-38	3.0-4.4	50-90	---	100-180	0
	38-80	3.0-6.5	0.0-0.5	---	0.2-7.0	0
Rubicon -----	0-2	4.5-5.5	50-90	---	---	---
	2-7	4.5-6.0	0.1-1.0	---	0.2-5.0	0
	7-32	4.5-6.0	0.5-3.0	1.0-9.0	---	0
	32-40	4.5-6.5	0.1-0.5	0.2-4.0	---	0
	40-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
116:						
Udipsamments ----	0-80	5.1-6.5	0.5-1.0	---	---	---
Udorthents.						
117D:						
Manistee, sandy substratum -----	0-1	4.0-5.0	50-90	---	---	---
	1-10	4.5-6.0	0.5-2.0	---	1.0-5.0	0
	10-26	5.1-6.0	0.5-3.0	1.0-5.0	---	0
	26-30	6.1-6.5	0.0-0.5	10-25	---	0
	30-36	6.1-7.3	0.0-0.5	27-50	---	0
	36-64	7.4-8.4	0.0-0.5	27-50	---	10-30
	64-80	7.4-8.4	0.0-0.5	1.0-5.0	---	10-25
120B:						
McMillan -----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
Trenary -----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
120D:						
McMillan -----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
120D:						
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
120E:						
McMillan-----	0-1	3.5-5.0	50-90	---	---	---
	1-4	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	4-6	3.5-5.0	0.5-2.0	---	1.0-2.0	---
	6-9	3.5-5.0	2.0-5.0	---	1.0-4.0	---
	9-16	3.5-5.0	0.5-3.0	---	1.0-4.0	---
	16-22	3.5-5.0	0.5-3.0	---	1.0-2.0	---
	22-32	3.5-5.5	0.0-0.5	---	1.0-2.0	---
	32-80	3.5-5.5	0.0-0.5	---	1.0-2.0	---
Trenary-----	0-2	4.5-6.5	2.0-5.0	4.0-18	---	0
	2-6	4.5-6.5	0.5-2.0	1.0-12	---	0
	6-12	4.5-6.0	2.0-5.0	---	2.0-16	0
	12-17	4.5-5.5	0.5-3.0	---	2.0-16	0
	17-26	5.1-6.5	0.5-2.0	---	1.0-10	0
	26-37	5.1-7.8	0.0-0.5	4.0-12	---	0
	37-80	6.6-8.4	0.0-0.5	2.0-9.0	---	10-30
122.						
Pits, quarry						
126:						
Pickford-----	0-6	5.1-7.8	3.0-15	10-45	---	0
	6-9	5.1-7.8	1.0-3.0	10-45	---	0
	9-13	5.1-7.8	0.0-0.5	20-30	---	0-10
	13-24	6.6-7.8	0.0-0.5	15-30	---	10-30
	24-80	7.4-8.4	0.0-0.5	15-30	---	10-30
129A:						
Rudyard-----	0-5	5.1-7.3	2.0-5.0	---	10-20	0
	5-8	5.1-7.3	0.0-0.5	10-25	---	0
	8-22	5.1-7.8	0.0-0.5	25-50	---	0-5
	22-29	7.4-8.4	0.0-0.5	25-50	---	0-5
	29-80	7.4-8.4	0.0-0.5	25-50	---	13-25
130A:						
Rudyard-----	0-5	5.1-7.3	2.0-5.0	---	10-20	0
	5-8	5.1-7.3	0.0-0.5	10-25	---	0
	8-22	5.1-7.8	0.0-0.5	25-50	---	0-5
	22-29	7.4-8.4	0.0-0.5	25-50	---	0-5
	29-80	7.4-8.4	0.0-0.5	25-50	---	13-25
Pickford-----	0-6	5.1-7.8	3.0-15	10-45	---	0
	6-9	5.1-7.8	1.0-3.0	10-45	---	0
	9-13	5.1-7.8	0.0-0.5	20-30	---	0-10
	13-24	6.6-7.8	0.0-0.5	15-30	---	10-30
	24-80	7.4-8.4	0.0-0.5	15-30	---	10-30

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
132B: Sugar-----	0-1	4.5-6.0	50-90	---	---	---
	1-4	5.1-6.5	2.0-5.0	4.0-15	---	0
	4-11	5.1-6.5	0.5-2.0	4.0-15	---	0
	11-20	5.1-6.5	0.5-3.0	1.0-10	---	0
	20-27	5.1-6.5	0.0-0.5	4.0-15	---	0
	27-35	5.1-6.5	0.0-0.5	4.0-15	---	0
	35-46	7.4-8.4	0.0-0.5	10-30	---	0-10
	46-80	7.4-8.4	0.0-0.5	10-30	---	10-30
133: Dorval-----	0-12	4.5-6.0	50-90	---	40-180	0
	12-19	5.1-6.5	50-90	40-180	---	0
	19-23	5.1-6.5	50-90	40-180	---	0
	23-33	6.5-7.8	0.0-0.5	18-31	---	0-20
	33-80	6.5-7.8	0.0-0.5	18-31	---	0-20
143: Caffey-----	0-6	6.6-7.3	50-90	60-140	---	0
	6-12	6.6-8.4	0.0-0.5	1.0-5.0	---	0-20
	12-21	6.6-8.4	0.0-0.5	1.0-5.0	---	0-20
	21-35	7.4-8.4	0.0-0.5	2.0-10	---	15-30
	35-80	7.4-8.4	0.0-0.5	2.0-10	---	15-30
146A: Allendale-----	0-5	4.5-7.3	2.0-5.0	4.0-20	---	---
	5-8	4.5-7.3	0.5-2.0	1.0-5.0	---	---
	8-10	4.5-7.3	2.0-5.0	1.0-5.0	---	---
	10-31	4.5-7.3	0.5-3.0	1.0-5.0	---	---
	31-35	6.1-8.4	0.0-0.5	8.0-25	---	---
	35-80	6.1-8.4	0.0-0.5	8.0-25	---	---
Fibre-----	0-5	4.5-5.0	50-90	---	100-180	0
	5-13	4.5-7.3	0.5-2.0	1.0-5.0	---	0
	13-17	4.5-7.3	0.5-3.0	1.0-5.0	---	0
	17-19	5.1-7.3	0.0-0.5	1.0-10	---	0
	19-27	6.6-7.8	0.0-0.5	15-35	---	0
	27-80	7.4-8.4	0.0-0.5	10-35	---	5-30
167D: Battydoe-----	0-1	4.0-5.5	50-90	---	---	---
	1-3	4.0-6.0	2.0-5.0	---	10-25	0
	3-5	4.0-6.0	0.5-2.0	---	2.0-10	0
	5-11	5.1-7.3	2.0-5.0	1.0-5.0	---	0
	11-20	5.6-7.3	0.0-0.5	1.0-5.0	---	0
	20-28	6.6-7.8	0.0-0.5	2.0-10	---	0
	28-80	7.4-8.4	0.0-0.5	2.0-10	---	0
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
173B:						
Paquin-----	0-2	3.5-5.0	50-90	---	---	---
	2-12	3.5-5.5	0.5-2.0	---	3.0-5.0	---
	12-14	3.5-5.5	2.0-5.0	---	1.0-4.0	---
	14-17	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	17-27	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	27-34	4.5-6.0	0.2-1.0	---	1.0-2.0	---
	34-80	4.5-6.5	0.0-0.5	3.0-5.0	---	---
Finch-----						
	0-1	3.5-5.6	50-90	---	---	---
	1-11	3.5-6.0	0.5-2.0	---	0.0-4.0	---
	11-42	3.5-6.0	0.5-3.0	---	2.0-8.0	---
	42-80	5.1-6.5	0.0-0.5	0.0-1.0	---	---
174B:						
Croswell-----						
	0-2	4.5-5.0	50-90	---	---	---
	2-6	3.5-6.0	0.1-1.0	---	0.2-7.0	0
	6-15	4.5-6.0	0.5-3.0	---	1.0-12	0
	15-22	5.1-6.5	0.0-0.5	0.0-7.0	---	0
	22-80	5.1-6.5	0.0-0.5	0.0-7.0	---	0
Spot-----						
	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
175D:						
Wallace-----						
	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
Spot-----						
	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
175E:						
Wallace-----						
	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
Spot-----						
	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
176B:						
Paquin-----	0-2	3.5-5.0	50-90	---	---	---
	2-12	3.5-5.5	0.5-2.0	---	3.0-5.0	---
	12-14	3.5-5.5	2.0-5.0	---	1.0-4.0	---
	14-17	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	17-27	3.5-5.5	1.0-5.0	---	1.0-2.0	---
	27-34	4.5-6.0	0.2-1.0	---	1.0-2.0	---
	34-80	4.5-6.5	0.0-0.5	3.0-5.0	---	---
Spot-----						
	0-2	3.5-5.5	50-90	---	100-180	---
	2-8	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	8-10	3.5-6.0	2.0-5.0	---	4.0-16	0
	10-18	3.5-6.0	0.5-3.0	---	1.0-12	0
	18-80	3.5-6.5	0.0-0.5	---	0.0-7.0	0
179B:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
179D:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
179E:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
179F:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
180B:						
Millecoquins----	0-2	4.5-6.0	2.0-5.0	---	3.0-7.0	---
	2-4	4.5-5.5	0.5-2.0	---	3.0-7.0	---
	4-5	4.5-5.5	2.0-5.0	---	3.0-7.0	---
	5-12	4.5-5.5	0.5-3.0	---	3.0-7.0	---
	12-25	4.5-6.5	0.0-0.5	---	3.0-15	---
	25-31	5.6-7.3	0.0-0.5	3.0-15	---	---
	31-55	6.6-7.8	0.0-0.5	3.0-15	---	10-20
	55-80	7.4-8.4	0.0-0.5	3.0-15	---	10-20

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
186D:						
Sporley-----	0-4	3.5-5.5	50-90	---	---	---
	4-8	3.5-5.5	0.5-2.0	---	3.0-15	---
	8-11	4.5-5.5	2.0-5.0	---	3.0-15	---
	11-16	4.5-6.0	2.0-5.0	---	3.0-15	---
	16-22	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	22-45	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	45-80	5.0-6.5	0.0-0.5	---	2.0-8.0	---
186E:						
Sporley-----	0-4	3.5-5.5	50-90	---	---	---
	4-8	3.5-5.5	0.5-2.0	---	3.0-15	---
	8-11	4.5-5.5	2.0-5.0	---	3.0-15	---
	11-16	4.5-6.0	2.0-5.0	---	3.0-15	---
	16-22	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	22-45	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	45-80	5.0-6.5	0.0-0.5	---	2.0-8.0	---
186F:						
Sporley-----	0-4	3.5-5.5	50-90	---	---	---
	4-8	3.5-5.5	0.5-2.0	---	3.0-15	---
	8-11	4.5-5.5	2.0-5.0	---	3.0-15	---
	11-16	4.5-6.0	2.0-5.0	---	3.0-15	---
	16-22	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	22-45	4.5-6.5	0.0-0.5	---	2.0-8.0	---
	45-80	5.0-6.5	0.0-0.5	---	2.0-8.0	---
187B:						
Auger-----	0-2	3.4-5.0	50-90	---	---	---
	2-5	3.4-5.0	0.5-2.0	---	1.0-4.0	---
	5-6	3.4-5.0	2.0-5.0	---	3.0-7.0	---
	6-15	3.4-5.0	0.5-3.0	---	3.0-7.0	---
	15-25	4.5-6.0	0.0-0.5	---	1.0-4.0	---
	25-80	4.5-6.0	0.0-0.5	---	1.0-4.0	---
188:						
Hendrie-----	0-4	4.5-6.0	50-90	---	100-180	---
	4-7	4.5-6.0	0.5-2.0	---	1.0-4.0	---
	7-16	6.1-7.3	0.5-2.0	3.0-7.0	---	---
	16-80	7.4-8.4	0.0-0.5	1.0-4.0	---	---
189A:						
Bodi-----	0-1	3.4-5.0	50-90	---	---	---
	1-4	3.4-5.0	0.5-2.0	---	0.5-3.0	0
	4-5	3.4-5.0	2.0-5.0	---	4.0-8.0	0
	5-17	3.4-5.0	0.5-3.0	---	4.0-8.0	0
	17-24	4.5-5.5	0.5-2.0	---	0.0-1.0	0
	24-44	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	44-80	4.5-6.1	0.0-0.5	0.0-0.5	---	0
Chesbrough-----	0-1	3.6-5.0	50-90	---	---	---
	1-2	3.6-5.0	2.0-5.0	---	0.5-5.0	0
	2-4	3.6-5.0	0.5-2.0	---	0.5-5.0	0
	4-10	4.0-5.5	1.0-3.0	---	4.0-8.0	0
	10-12	4.0-5.5	0.5-2.0	---	0.0-1.0	0
	12-16	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	16-22	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	22-30	4.5-6.0	0.0-0.5	---	0.0-0.5	0
	30-80	4.5-6.0	0.0-0.5	---	0.0-0.5	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
190B:						
Bodi-----	0-1	3.4-5.0	50-90	---	---	---
	1-4	3.4-5.0	0.5-2.0	---	0.5-3.0	0
	4-5	3.4-5.0	2.0-5.0	---	4.0-8.0	0
	5-17	3.4-5.0	0.5-3.0	---	4.0-8.0	0
	17-24	4.5-5.5	0.5-2.0	---	0.0-1.0	0
	24-44	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	44-80	4.5-6.1	0.0-0.5	0.0-0.5	---	0
191D:						
Widgeon-----	0-2	3.4-5.0	50-90	---	---	---
	2-5	3.4-5.0	2.0-5.0	---	5.0-15	---
	5-9	3.4-5.0	0.5-2.0	---	1.0-5.0	---
	9-12	3.4-5.0	2.0-5.0	---	1.0-15	---
	12-16	3.4-5.0	0.5-3.0	---	1.0-15	---
	16-32	3.4-5.5	0.0-0.5	---	1.0-15	---
	32-80	4.5-5.5	0.0-0.5	---	1.0-15	---
Kalkaska-----	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0
193A:						
Annianias-----	0-4	3.5-5.0	50-90	---	---	---
	4-7	3.5-5.0	0.5-2.0	---	1.0-4.0	---
	7-10	3.5-5.0	2.0-5.0	---	3.0-7.0	---
	10-15	3.5-5.0	0.5-3.0	---	3.0-7.0	---
	15-26	3.5-5.0	0.0-0.5	---	1.0-4.0	---
	26-47	4.5-5.5	0.0-0.5	---	1.0-4.0	---
	47-80	4.5-7.0	0.0-0.5	---	1.0-4.0	---
194A:						
Hendrie-----	0-4	4.5-6.0	50-90	---	100-180	---
	4-7	4.5-6.0	0.5-2.0	---	1.0-4.0	---
	7-16	6.1-7.3	0.5-2.0	3.0-7.0	---	---
	16-80	7.4-8.4	0.0-0.5	1.0-4.0	---	---
Annianias-----	0-4	3.5-5.0	50-90	---	---	---
	4-7	3.5-5.0	0.5-2.0	---	1.0-4.0	---
	7-10	3.5-5.0	2.0-5.0	---	3.0-7.0	---
	10-15	3.5-5.0	0.5-3.0	---	3.0-7.0	---
	15-26	3.5-5.0	0.0-0.5	---	1.0-4.0	---
	26-47	4.5-5.5	0.0-0.5	---	1.0-4.0	---
	47-80	4.5-7.0	0.0-0.5	---	1.0-4.0	---
195A:						
Chesbrough-----	0-1	3.6-5.0	50-90	---	---	---
	1-2	3.6-5.0	2.0-5.0	---	0.5-5.0	0
	2-4	3.6-5.0	0.5-2.0	---	0.5-5.0	0
	4-10	4.0-5.5	1.0-3.0	---	4.0-8.0	0
	10-12	4.0-5.5	0.5-2.0	---	0.0-1.0	0
	12-16	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	16-22	4.5-5.5	0.0-0.5	---	0.0-1.0	0
	22-30	4.5-6.0	0.0-0.5	---	0.0-0.5	0
	30-80	4.5-6.0	0.0-0.5	---	0.0-0.5	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
197D:						
Zandi-----	0-2	3.4-5.0	50-90	---	---	---
	2-6	3.4-6.0	0.5-2.0	---	1.0-8.0	0
	6-7	3.4-6.0	2.0-5.0	---	2.0-8.0	0
	7-12	3.4-6.0	0.5-3.0	---	1.0-8.0	0
	12-22	4.5-6.0	0.5-3.0	---	1.0-8.0	0
	22-37	4.5-6.0	0.0-0.5	---	1.0-5.0	0
	37-80	4.5-6.0	0.0-0.5	---	1.0-4.0	0
197E:						
Zandi-----	0-2	3.4-5.0	50-90	---	---	---
	2-6	3.4-6.0	0.5-2.0	---	1.0-8.0	0
	6-7	3.4-6.0	2.0-5.0	---	2.0-8.0	0
	7-12	3.4-6.0	0.5-3.0	---	1.0-8.0	0
	12-22	4.5-6.0	0.5-3.0	---	1.0-8.0	0
	22-37	4.5-6.0	0.0-0.5	---	1.0-5.0	0
	37-80	4.5-6.0	0.0-0.5	---	1.0-4.0	0
198B:						
Vilas-----	0-3	3.4-5.5	2.0-5.0	---	2.0-10	---
	3-5	3.4-5.5	0.5-2.0	---	2.0-8.0	0
	5-9	4.5-6.0	0.5-3.0	---	3.0-5.0	0
	9-20	4.5-6.0	0.5-3.0	---	3.0-5.0	0
	20-80	4.5-6.5	0.0-0.5	---	0.0-3.0	0
198D:						
Vilas-----	0-3	3.4-5.5	2.0-5.0	---	2.0-10	---
	3-5	3.4-5.5	0.5-2.0	---	2.0-8.0	0
	5-9	4.5-6.0	0.5-3.0	---	3.0-5.0	0
	9-20	4.5-6.0	0.5-3.0	---	3.0-5.0	0
	20-80	4.5-6.5	0.0-0.5	---	0.0-3.0	0
199B:						
Auger-----	0-2	3.4-5.0	50-90	---	---	---
	2-5	3.4-5.0	0.5-2.0	---	1.0-4.0	---
	5-6	3.4-5.0	2.0-5.0	---	3.0-7.0	---
	6-15	3.4-5.0	0.5-3.0	---	3.0-7.0	---
	15-25	4.5-6.0	0.0-0.5	---	1.0-4.0	---
	25-80	4.5-6.0	0.0-0.5	---	1.0-4.0	---
Annaias-----	0-4	3.5-5.0	50-90	---	---	---
	4-7	3.5-5.0	0.5-2.0	---	1.0-4.0	---
	7-10	3.5-5.0	2.0-5.0	---	3.0-7.0	---
	10-15	3.5-5.0	0.5-3.0	---	3.0-7.0	---
	15-26	3.5-5.0	0.0-0.5	---	1.0-4.0	---
	26-47	4.5-5.5	0.0-0.5	---	1.0-4.0	---
	47-80	4.5-7.0	0.0-0.5	---	1.0-4.0	---
200B:						
Pence-----	0-1	4.5-6.5	2.0-5.0	---	1.0-9.0	0
	1-4	4.5-6.5	0.5-2.0	---	1.0-9.0	0
	4-6	4.5-6.0	2.0-5.0	---	2.0-15	0
	6-17	4.5-6.0	0.5-3.0	---	2.0-15	0
	17-28	4.5-6.5	0.0-0.5	0.0-10	---	0
	28-80	5.1-6.5	0.0-0.5	0.0-4.0	---	0

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
200D:						
Pence-----	0-1	4.5-6.5	2.0-5.0	---	1.0-9.0	0
	1-4	4.5-6.5	0.5-2.0	---	1.0-9.0	0
	4-6	4.5-6.0	2.0-5.0	---	2.0-15	0
	6-17	4.5-6.0	0.5-3.0	---	2.0-15	0
	17-28	4.5-6.5	0.0-0.5	0.0-10	---	0
	28-80	5.1-6.5	0.0-0.5	0.0-4.0	---	0
200E:						
Pence-----	0-1	4.5-6.5	2.0-5.0	---	1.0-9.0	0
	1-4	4.5-6.5	0.5-2.0	---	1.0-9.0	0
	4-6	4.5-6.0	2.0-5.0	---	2.0-15	0
	6-17	4.5-6.0	0.5-3.0	---	2.0-15	0
	17-28	4.5-6.5	0.0-0.5	0.0-10	---	0
	28-80	5.1-6.5	0.0-0.5	0.0-4.0	---	0
201B:						
Croswell, rarely flooded-----	0-2	4.5-5.0	50-90	---	---	---
	2-6	3.5-6.0	0.1-1.0	---	0.2-7.0	0
	6-15	4.5-6.0	0.5-3.0	---	1.0-12	0
	15-22	5.1-6.5	0.0-0.5	0.0-7.0	---	0
	22-80	5.1-6.5	0.0-0.5	0.0-7.0	---	0
Deford, frequently flooded-----	0-5	4.5-6.5	50-90	100-180	---	---
	5-32	5.1-8.4	0.0-10	0.0-19	---	0
	32-80	5.1-8.4	0.0-10	0.0-19	---	0
202B:						
Whitewash-----	0-3	4.5-6.0	50-90	---	---	---
	3-7	5.1-6.5	0.0-0.5	---	---	0
	7-9	3.5-5.5	1.0-3.0	---	---	0
	9-80	4.5-7.3	0.0-0.5	---	---	0
203D:						
Frohling-----	0-1	3.5-5.0	50-90	---	---	---
	1-3	3.5-5.5	0.5-2.0	---	2.0-5.0	0
	3-7	3.5-5.5	2.0-5.0	---	2.0-5.0	0
	7-19	3.5-5.5	0.5-3.0	---	2.0-5.0	0
	19-55	3.5-6.0	0.0-0.5	---	1.0-8.0	0
	55-80	4.5-6.5	0.0-0.5	---	1.0-6.0	0
203E:						
Frohling-----	0-1	3.5-5.0	50-90	---	---	---
	1-3	3.5-5.5	0.5-2.0	---	2.0-5.0	0
	3-7	3.5-5.5	2.0-5.0	---	2.0-5.0	0
	7-19	3.5-5.5	0.5-3.0	---	2.0-5.0	0
	19-55	3.5-6.0	0.0-0.5	---	1.0-8.0	0
	55-80	4.5-6.5	0.0-0.5	---	1.0-6.0	0
204:						
Gogomain-----	0-6	5.6-6.5	50-100	100-180	---	---
	6-10	6.6-7.3	2.0-4.0	5.0-15	---	0
	10-29	6.6-7.8	0.0-0.5	2.0-10	---	0
	29-37	6.6-7.8	0.0-0.5	2.0-10	---	0
	37-80	7.4-8.4	0.0-0.5	15-30	---	10-30

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct	
205B:							
Kalkaska, burned	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0	
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0	
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0	
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0	
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0	
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0	
205D:							
Kalkaska, burned	0-2	3.5-6.0	2.0-5.0	---	2.0-11	0	
	2-6	4.5-6.0	0.1-1.0	---	1.0-5.0	0	
	6-8	4.5-6.0	2.0-5.0	---	2.0-9.0	0	
	8-16	4.5-6.0	0.5-3.0	---	1.0-5.0	0	
	16-26	4.5-6.5	0.1-0.5	---	0.2-4.0	0	
	26-80	4.5-6.5	0.1-0.5	0.2-4.0	---	0	
206B:							
Deerton-----	0-2	4.5-6.0	50-90	---	---	---	
	2-6	4.5-6.0	0.5-2.0	---	1.0-5.0	---	
	6-23	4.5-5.5	2.0-5.0	---	2.0-9.0	---	
	23-33	4.5-6.0	0.0-0.5	---	0.5-2.0	---	
	33-55	---	---	---	---	---	
	55-80	---	---	---	---	---	
211D:							
Frohling-----	0-1	3.5-5.0	50-90	---	---	---	
	1-3	3.5-5.5	0.5-2.0	---	2.0-5.0	0	
	3-7	3.5-5.5	2.0-5.0	---	2.0-5.0	0	
	7-19	3.5-5.5	0.5-3.0	---	2.0-5.0	0	
	19-55	3.5-6.0	0.0-0.5	---	1.0-8.0	0	
	55-80	4.5-6.5	0.0-0.5	---	1.0-6.0	0	
Wallace-----	0-2	3.5-5.5	50-90	---	---	---	
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---	
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---	
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---	
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---	
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---	
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---	
211E:							
Frohling-----	0-1	3.5-5.0	50-90	---	---	---	
	1-3	3.5-5.5	0.5-2.0	---	2.0-5.0	0	
	3-7	3.5-5.5	2.0-5.0	---	2.0-5.0	0	
	7-19	3.5-5.5	0.5-3.0	---	2.0-5.0	0	
	19-55	3.5-6.0	0.0-0.5	---	1.0-8.0	0	
	55-80	4.5-6.5	0.0-0.5	---	1.0-6.0	0	
Wallace-----	0-2	3.5-5.5	50-90	---	---	---	
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---	
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---	
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---	
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---	
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---	
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---	
212:							
Markey-----	0-3	4.5-6.0	50-90	---	100-180	---	
	3-20	4.5-6.5	50-90	100-180	---	---	
	20-80	4.5-7.8	0.0-0.5	0.0-0.5	---	---	

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
214D:						
Rousseau-----	0-1	3.5-6.0	50-90	---	---	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Markey-----	0-3	4.5-6.0	50-90	---	100-180	---
	3-20	4.5-6.5	50-90	100-180	---	---
	20-80	4.5-7.8	0.0-0.5	0.0-0.5	---	---
214E:						
Rousseau-----	0-1	3.5-6.0	50-90	---	100-180	0
	1-4	3.5-6.0	0.1-1.0	---	0.2-8.0	0
	4-20	3.5-6.5	0.5-3.0	---	1.0-12	0
	20-33	3.5-6.5	0.0-0.5	---	0.0-7.0	0
	33-66	3.5-6.5	0.0-0.5	0.0-7.0	---	0
	66-80	3.5-6.5	0.0-0.5	0.0-7.0	---	0
Markey-----	0-3	4.5-6.0	50-90	---	100-180	---
	3-20	4.5-6.5	50-90	100-180	---	---
	20-80	4.5-7.8	0.0-0.5	0.0-0.5	---	---
215B:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
Alcona-----	0-1	4.0-5.0	50-90	---	---	---
	1-3	4.0-5.5	0.5-2.0	---	1.0-8.0	---
	3-17	4.0-5.5	0.5-3.0	---	1.0-8.0	---
	17-23	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	23-54	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	54-80	5.1-7.8	0.0-0.5	1.0-8.0	---	---
215D:						
Wallace-----	0-2	3.5-5.5	50-90	---	---	---
	2-10	3.5-5.5	0.5-2.0	---	2.0-4.0	---
	10-11	4.0-5.5	2.0-5.0	---	1.0-4.0	---
	11-21	4.5-5.5	2.0-5.0	---	1.0-4.0	---
	21-26	4.5-5.5	0.5-3.0	---	1.0-4.0	---
	26-59	4.5-6.0	0.0-0.5	1.0-4.0	---	---
	59-80	4.5-6.5	0.0-0.5	1.0-4.0	---	---
Alcona-----	0-1	4.0-5.0	50-90	---	---	---
	1-3	4.0-5.5	0.5-2.0	---	1.0-8.0	---
	3-17	4.0-5.5	0.5-3.0	---	1.0-8.0	---
	17-23	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	23-54	4.0-5.8	0.0-0.5	---	2.0-8.0	---
	54-80	5.1-7.8	0.0-0.5	1.0-8.0	---	---

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation- exchange capacity	Effective cation- exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
246B:						
Garlic-----	0-2	3.5-5.6	50-90	---	---	---
	2-9	3.5-5.5	0.5-2.0	---	0.1-4.0	---
	9-11	3.5-5.5	2.0-5.0	---	0.1-4.0	---
	11-20	3.5-5.5	0.5-3.0	---	0.1-4.0	---
	20-29	5.1-6.0	0.0-0.5	0.5-4.0	---	---
	29-80	5.1-6.0	0.0-0.5	0.5-4.0	---	---
246D:						
Garlic-----	0-2	3.5-5.6	50-90	---	---	---
	2-9	3.5-5.5	0.5-2.0	---	0.1-4.0	---
	9-11	3.5-5.5	2.0-5.0	---	0.1-4.0	---
	11-20	3.5-5.5	0.5-3.0	---	0.1-4.0	---
	20-29	5.1-6.0	0.0-0.5	0.5-4.0	---	---
	29-80	5.1-6.0	0.0-0.5	0.5-4.0	---	---
286B:						
Fence-----	0-2	3.5-5.5	50-90	---	---	---
	2-5	3.5-5.5	0.5-2.0	---	3.0-15	---
	5-13	4.5-6.0	2.0-5.0	3.0-15	---	---
	13-23	4.5-6.5	0.0-0.5	2.0-8.0	---	---
	23-33	4.5-6.5	0.0-0.5	2.0-8.0	---	---
	33-80	5.0-7.8	0.0-0.5	2.0-8.0	---	---
287B:						
Noseum-----	0-2	3.5-5.5	50-90	---	---	---
	2-5	3.5-6.0	0.5-2.0	---	1.0-5.0	---
	5-7	3.5-6.0	2.0-5.0	---	2.0-9.0	---
	7-19	3.5-6.0	0.5-3.0	---	2.0-9.0	---
	19-27	3.5-6.0	0.5-3.0	---	1.0-4.0	---
	27-80	3.5-6.0	0.0-0.5	---	1.0-4.0	---
300.						
Beaches						
W.						
Water						

Table 18.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
10D: Ontonagon-----	---	---	---	---	---	---	Moderate	High	Moderate
15B: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
15D: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
15E: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
15F: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
16B: Graveraet-----	Fragipan	14-24	10-16	Strongly cemented	---	---	Moderate	Moderate	Moderate
17C: Deer Park-----	---	---	---	---	---	---	Low	Low	Low
17E: Deer Park-----	---	---	---	---	---	---	Low	Low	Low
17F: Deer Park-----	---	---	---	---	---	---	Low	Low	Low
18B: Rubicon-----	---	---	---	---	---	---	Low	Low	High
18D: Rubicon-----	---	---	---	---	---	---	Low	Low	High
18E: Rubicon-----	---	---	---	---	---	---	Low	Low	High
18F: Rubicon-----	---	---	---	---	---	---	Low	Low	High
19B: Kalkaska-----	---	---	---	---	---	---	Low	Low	High

Table 18.--Soil Features--Continued

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			
19D: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
19E: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
19F: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
20B: Crowell-----	---	---	---	---	---	---	Low	Low	Moderate
21A: Finch-----	Ortstein	7-13	24-40	Strongly cemented	---	---	Low	High	Moderate
22: Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
23: Leafriver-----	---	---	---	---	0	5-10	High	High	High
24B: Springlake-----	---	---	---	---	---	---	Low	Low	Moderate
29A: Solona-----	---	---	---	---	---	---	Moderate	High	Low
30: Kinross-----	---	---	---	---	0-2	0-4	Moderate	High	Moderate
31B: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
31D: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
31E: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
31F: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
32A: Allendale-----	---	---	---	---	---	---	Moderate	High	Moderate

Table 18.--Soil Features--Continued

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			
33. Pits									
35: Histosols-----	---	---	---	---	6-18	50-55	High	High	Moderate
Aquents-----	---	---	---	---	---	---	High	---	---
36: Carbondale-----	---	---	---	---	15-28	30-48	High	Moderate	Moderate
Lupton-----	---	---	---	---	15-28	30-48	High	Moderate	Low
Tawas-----	---	---	---	---	8-24	18-40	High	Moderate	Moderate
37: Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
Greenwood-----	---	---	---	---	6-18	50-55	High	Moderate	High
Loxley-----	---	---	---	---	6-18	50-55	High	Moderate	High
45D: Rubicon-----	---	---	---	---	---	---	Low	Low	High
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
45E: Rubicon-----	---	---	---	---	---	---	Low	Low	High
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
46B: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
46D: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
46E: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
46F: Kalkaska-----	---	---	---	---	---	---	Low	Low	High

Table 18.--Soil Features--Continued

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			
47B: Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
47D: Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
53B: Menominee, sandy substratum-----	---	---	---	---	---	---	Low	Low	Moderate
57B: Amadon-----	Bedrock (lithic)	10-20	---	Indurated	---	---	Moderate	Low	Moderate
Longrie----- Rock outcrop.	Bedrock (lithic)	20-40	---	Indurated	---	---	Moderate	Low	Low
57D: Amadon-----	Bedrock (lithic)	10-20	---	Indurated	---	---	Moderate	Low	Moderate
Longrie----- Rock outcrop.	Bedrock (lithic)	20-40	---	Indurated	---	---	Moderate	Low	Low
57E: Amadon-----	Bedrock (lithic)	10-20	---	Indurated	---	---	Moderate	Low	Moderate
Longrie----- Rock outcrop.	Bedrock (lithic)	20-40	---	Indurated	---	---	Moderate	Low	Low
60A: Kinross-----	---	---	---	---	---	---	Moderate	High	Moderate
Au Gres-----	---	---	---	---	---	---	Moderate	Low	Moderate
61B: Paquin-----	Ortstein	10-16	10-20	Strongly cemented	---	---	Low	Low	High
65B: Rubicon, organic surface-----	---	---	---	---	---	---	Low	Low	High
65D: Rubicon, organic surface-----	---	---	---	---	---	---	Low	Low	High

Table 18.--Soil Features--Continued

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			
65E: Rubicon, organic surface-----	---	---	---	---	---	---	Low	Low	High
66B: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Kaks-----	---	---	---	---	---	---	Low	Low	Moderate
66D: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Kaks-----	---	---	---	---	---	---	Low	Low	Moderate
66E: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Kaks-----	---	---	---	---	---	---	Low	Low	Moderate
66F: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Kaks-----	---	---	---	---	---	---	Low	Low	Moderate
74B: Menominee, sandy substratum-----	---	---	---	---	---	---	Low	Low	Moderate
Graveraet-----	Fragipan	14-24	10-16	Strongly cemented	---	---	Moderate	Moderate	Moderate
75D: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	---	---	Low	Low	High
75E: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	---	---	Low	Low	High
75F: Dillingham-----	Fragipan	16-28	8-16	Strongly cemented	---	---	Low	Low	High
Kalkaska-----	---	---	---	---	---	---	Low	Low	High

Table 18.--Soil Features--Continued

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			
76D: Menominee, sandy substratum-----	---	---	---	---	---	---	Low	Low	Moderate
Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
76E: Menominee, sandy substratum-----	---	---	---	---	---	---	Low	Low	Moderate
Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
84B: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
Alcona-----	---	---	---	---	---	---	Moderate	Low	Low
84D: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
Alcona-----	---	---	---	---	---	---	Moderate	Low	Low
84E: Liminga-----	---	---	---	---	---	---	Low	Low	Moderate
Alcona-----	---	---	---	---	---	---	Moderate	Low	Low
85B: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Okeefe-----	---	---	---	---	---	---	Low	Low	High
85D: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Okeefe-----	---	---	---	---	---	---	Low	Low	High
85E: Kalkaska-----	---	---	---	---	---	---	Low	Low	High
Okeefe-----	---	---	---	---	---	---	Low	Low	High
88B: Crowell-----	---	---	---	---	---	---	Low	Low	Moderate

Table 18.--Soil Features--Continued

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			
88B: Au Gres-----	---	---	---	---	---	---	Moderate	Low	Moderate
89A: Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
Finch-----	Ortstein	7-13	24-40	Strongly cemented	---	---	Low	High	Moderate
90D: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
90E: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
90F: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
91D: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
91E: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
91F: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
93F: Ontonagon-----	---	---	---	---	---	---	Moderate	High	Moderate
Pickford, occasionally flooded-----	---	---	---	---	---	---	High	High	Low
94A: Tawas-----	---	---	---	---	8-24	18-40	High	Moderate	Moderate
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
Finch-----	Ortstein	7-13	24-40	Strongly cemented	---	---	Low	High	Moderate

Table 18.--Soil Features--Continued

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			
102: Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
104B: Pence-----	---	---	---	---	---	---	Moderate	Low	Moderate
104D: Pence-----	---	---	---	---	---	---	Moderate	Low	Moderate
104E: Pence-----	---	---	---	---	---	---	Moderate	Low	Moderate
109D: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
109F: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
110D: Au Gres-----	---	---	---	---	---	---	Moderate	Low	Moderate
Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
Rubicon.									
110E: Au Gres-----	---	---	---	---	---	---	Moderate	Low	Moderate
Dawson-----	---	---	---	---	0-19	19-38	High	Moderate	High
Rubicon.									
116: Udipsamments-----	---	---	---	---	---	---	---	Low	Moderate
Udorthents-----	---	---	---	---	---	---	---	---	---

Table 18.--Soil Features--Continued

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			
117D: Manistee, sandy substratum-----	---	---	---	---	---	---	Low	High	Moderate
120B: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
120D: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
120E: McMillan-----	---	---	---	---	---	---	Moderate	Low	High
Trenary-----	---	---	---	---	---	---	Moderate	Low	Moderate
122: Pits, quarry-----	Bedrock (lithic)	0-4	---	Indurated	---	---	---	---	---
126: Pickford-----	---	---	---	---	---	---	High	High	Low
129A: Rudyard-----	---	---	---	---	---	---	Moderate	High	Low
130A: Rudyard-----	---	---	---	---	---	---	Moderate	High	Low
Pickford-----	---	---	---	---	---	---	High	High	Low
132B: Sugar-----	---	---	---	---	---	---	High	High	Low
133: Dorval-----	---	---	---	---	8-18	30-47	High	High	Moderate
143: Caffey-----	---	---	---	---	0-2	0-4	Moderate	High	Low
146A: Allendale-----	---	---	---	---	---	---	Moderate	High	Moderate

Table 18.--Soil Features--Continued

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			
146A: Fibre-----	---	---	---	---	---	---	Moderate	High	Moderate
167D: Battydoe-----	---	---	---	---	---	---	Moderate	Low	Low
Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
173B: Paquin-----	Ortstein	10-16	10-20	Strongly cemented	---	---	Low	Low	High
Finch-----	Ortstein	7-13	24-40	Strongly cemented	---	---	Low	High	Moderate
174B: Crosswell-----	---	---	---	---	---	---	Low	Low	Moderate
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
175D: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
175E: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
176B: Paquin-----	Ortstein	10-16	10-20	Strongly cemented	---	---	Low	Low	High
Spot-----	Ortstein	8-12	2-15	Strongly cemented	0-2	0-4	Moderate	High	High
179B: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
179D: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
179E: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
179F: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High

Table 18.--Soil Features--Continued

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			
180B: Millecoquins-----	---	---	---	---	---	---	High	Moderate	Low
186D: Sporley-----	---	---	---	---	---	---	High	Low	High
186E: Sporley-----	---	---	---	---	---	---	High	Low	High
186F: Sporley-----	---	---	---	---	---	---	High	Low	High
187B: Auger-----	---	---	---	---	---	---	Moderate	Moderate	High
188: Hendrie-----	---	---	---	---	0-2	0-4	High	Moderate	High
189A: Bodi-----	Fragipan Dense material	20-30 36-55	14-28 25-48	Strongly cemented Strongly cemented	---	---	Moderate	Moderate	High
Chesbrough-----	Fragipan	13-20	4-10	Strongly cemented	---	---	High	Moderate	High
190B: Bodi-----	Fragipan Dense material	20-30 36-55	14-28 25-48	Strongly cemented Strongly cemented	---	---	Moderate	Moderate	High
191D: Widgeon-----	---	---	---	---	---	---	High	Moderate	High
Kalkaska-----	---	---	---	---	---	---	Low	Low	High
193A: Annantias-----	---	---	---	---	---	---	High	Moderate	High
194A: Hendrie-----	---	---	---	---	0-2	0-4	High	Moderate	High
Annantias-----	---	---	---	---	---	---	High	Moderate	High
195A: Chesbrough-----	Fragipan	13-20	4-10	Strongly cemented	---	---	High	Moderate	High

Table 18.--Soil Features--Continued

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			
197D: Zandi-----	---	---	---	---	---	---	Moderate	Low	High
197E: Zandi-----	---	---	---	---	---	---	Moderate	Low	High
198B: Vilas-----	---	---	---	---	---	---	Low	Low	High
198D: Vilas-----	---	---	---	---	---	---	Low	Low	High
199B: Auger-----	---	---	---	---	---	---	Moderate	Moderate	High
Annaias-----	---	---	---	---	---	---	High	Moderate	High
200B: Pence-----	---	---	---	---	---	---	Low	Low	Moderate
200D: Pence-----	---	---	---	---	---	---	Low	Low	Moderate
200E: Pence-----	---	---	---	---	---	---	Low	Low	Moderate
201B: Crowell, rarely flooded-----	---	---	---	---	---	---	Low	Low	Moderate
Deford, frequently flooded-----	---	---	---	---	0-2	0-3	Moderate	High	Low
202B: Whitewash-----	---	---	---	---	---	---	Low	Low	High
203D: Frohling-----	Fragipan	16-24	24-50	Strongly cemented	---	---	Moderate	Low	High
203E: Frohling-----	Fragipan	16-24	24-50	Strongly cemented	---	---	Moderate	Low	High
204: Gogomain-----	---	---	---	---	0-2	0-4	High	High	Low

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
205B: Kalkaska, burned-----	---	---	---	---	---	---	Low	Low	High
205D: Kalkaska, burned-----	---	---	---	---	---	---	Low	Low	High
206B: Deerton-----	Bedrock (paralithic)	24-40	6-36	Weakly cemented	---	---	Low	Low	High
	Bedrock (lithic)	30-60	---	Indurated					
211D: Frohling-----	Fragipan	16-24	24-50	Strongly cemented	---	---	Moderate	Low	High
Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
211E: Frohling-----	Fragipan	16-24	24-50	Strongly cemented	---	---	Moderate	Low	High
Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
212: Markey-----	---	---	---	---	8-24	18-40	High	Moderate	High
214D: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Markey-----	---	---	---	---	8-24	18-40	High	Moderate	High
214E: Rousseau-----	---	---	---	---	---	---	Low	Low	Moderate
Markey-----	---	---	---	---	8-24	18-40	High	Moderate	High
215B: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
Alcona-----	---	---	---	---	---	---	Moderate	Low	Low
215D: Wallace-----	Ortstein	8-18	8-30	Strongly cemented	---	---	Low	Low	High
Alcona-----	---	---	---	---	---	---	Moderate	Low	Low

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
246B: Garlic-----	---	---	---	---	---	---	Low	Low	High
246D: Garlic-----	---	---	---	---	---	---	Low	Low	High
286B: Fence-----	---	---	---	---	---	---	High	Low	High
287B: Noseum-----	---	---	---	---	---	---	Moderate	Low	High
300. Beaches									
W. Water									

Table 19.--Soil Moisture Status by Depth

(Depths of layers are in feet)

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
10D: Ontonagon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
15B: Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
15D: Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
15E: Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
15F: Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
16B: Graveraet-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.0: Moist 1.0-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---
17C: Deer Park-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
17E: Deer Park-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
17F: Deer Park-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
18B: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
18D: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
18E: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
18F: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
19B: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
19D: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
19E: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
19F: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
20B: Crowell-----	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-3.5: Moist 3.5-6.7: Wet ---	0.0-1.5: Dry 1.5-4.5: Moist 4.5-6.7: Wet	0.0-2.5: Dry 2.5-5.5: Moist 5.5-6.7: Wet	0.0-4.5: Moist 4.5-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-4.0: Moist 4.0-6.7: Wet ---
21A: Finch-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
22: Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
23: Leafriver-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
24B: Springlake-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
29A: Solona-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---
30: Kinross-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
31B: McMillan-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
31D: McMillan-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
31E: McMillan-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
31F: McMillan-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
32A:												
Allendale-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.5: Wet 2.5-6.7: Moist	0.0-1.0: Moist 1.0-2.5: Wet 2.5-6.7: Moist	0.0-1.0: Moist 1.0-2.5: Wet 2.5-6.7: Moist	0.0-2.0: Moist 2.0-2.5: Wet 2.5-6.7: Moist	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Moist 2.0-2.5: Wet 2.5-6.7: Moist	0.0-1.0: Moist 1.0-2.5: Wet 2.5-6.7: Moist	0.0-6.7: Moist ---
33. Pits												
35:												
Histosols-----	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet
Aquents-----	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet
36:												
Carbondale-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Lupton-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Tawas-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
37:												
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Greenwood-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
37: Loxley-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
45D: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
45E: Rubicon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
46B: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
46D: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
46E: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
46F:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
47B:												
Trenary-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
47D:												
Trenary-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
53B:												
Menominee, sandy substratum-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
57B:												
Amadon-----	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.0: Dry 1.0-1.2: Moist	0.0-1.2: Dry ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---
Longrie-----	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-1.0: Dry 1.0-3.0: Moist	0.0-1.5: Dry 1.5-3.0: Moist	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---
Rock outcrop.												
57D:												
Amadon-----	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.0: Dry 1.0-1.2: Moist	0.0-1.2: Dry ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
57D:												
Longrie-----	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-1.0: Dry 1.0-3.0: Moist	0.0-1.5: Dry 1.5-3.0: Moist	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---
Rock outcrop.												
57E:												
Amadon-----	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.0: Dry 1.0-1.2: Moist	0.0-1.2: Dry ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---	0.0-1.2: Moist ---
Longrie-----	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-1.0: Dry 1.0-3.0: Moist	0.0-1.5: Dry 1.5-3.0: Moist	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---	0.0-3.0: Moist ---
Rock outcrop.												
60A:												
Kinross-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
61B:												
Paquin-----	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-3.5: Moist 3.5-6.7: Wet ---	0.0-1.5: Dry 1.5-4.5: Moist 4.5-6.7: Wet	0.0-2.5: Dry 2.5-5.5: Moist 5.5-6.7: Wet	0.0-4.5: Moist 4.5-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-4.0: Moist 4.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
65B: Rubicon, organic surface-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
65D: Rubicon, organic surface-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
65E: Rubicon, organic surface-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
66B: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kaks-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
66D: Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kaks-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
66E:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kaks-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
66F:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kaks-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
74B:												
Menominee, sandy substratum-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Graveraet-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.0: Moist 1.0-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---
75D:												
Dillingham-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
75E:												
Dillingham-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
75F:												
Dillingham-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
76D:												
Menominee-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Trenary-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
76E:												
Menominee-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Trenary-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
84B:												
Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Alcona-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
84D:												
Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Alcona-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
84E:												
Liminga-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Alcona-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
85B:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Okeefe-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
85D:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Okeefe-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
85E:												
Kalkaska-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Okeefe-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
88B:												
Croswell-----	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-3.5: Moist 3.5-6.7: Wet ---	0.0-1.5: Dry 1.5-4.5: Moist 4.5-6.7: Wet	0.0-2.5: Dry 2.5-5.5: Moist 5.5-6.7: Wet	0.0-4.5: Moist 4.5-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-4.0: Moist 4.0-6.7: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
89A:												
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
89A:												
Finch-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
90D:												
Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist ---	0.0-3.0: Dry 3.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
90E:												
Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist ---	0.0-3.0: Dry 3.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
90F:												
Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist ---	0.0-3.0: Dry 3.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
91D:												
Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist ---	0.0-3.0: Dry 3.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
91E: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
91F: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
93F: Ontonagon-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Pickford, occasionally flooded-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Wet 1.5-6.7: Moist ---	0.0-1.5: Wet 1.5-6.7: Moist ---	0.0-1.5: Wet 1.5-6.7: Moist ---	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.7: Moist	0.0-1.5: Wet 1.5-6.7: Moist ---	0.0-1.5: Wet 1.5-6.7: Moist ---	0.0-6.7: Moist ---
94A: Tawas-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Finch-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
102: Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
104B: Pence-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
104D: Pence-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
104E: Pence-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
109D: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
109F: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
109F:												
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
110D:												
Au Gres-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Rubicon.												
110E:												
Au Gres-----	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-0.5: Dry 0.5-3.0: Moist 3.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.0: Moist 1.0-6.7: Wet ---	0.0-1.5: Moist 1.5-6.7: Wet ---
Dawson-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
Rubicon.												
116:												
Udipsamments----	---	---	---	---	---	---	---	---	---	---	---	---
Udorthents.												

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
126:												
Pickford-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.5: Wet	0.0-1.5: Wet	0.0-1.5: Wet	0.0-0.5: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-1.5: Wet	0.0-1.5: Wet	0.0-6.7: Moist
	---	---	1.5-6.7: Moist	1.5-6.7: Moist	1.5-6.7: Moist	0.5-1.5: Wet	---	---	0.5-1.5: Wet	1.5-6.7: Moist	1.5-6.7: Moist	---
	---	---	---	---	---	1.5-6.7: Moist	---	---	1.5-6.7: Moist	---	---	---
129A:												
Rudyard-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Moist
	---	---	0.5-1.0: Wet	0.5-1.0: Wet	0.5-1.0: Wet	---	---	---	---	0.5-1.0: Wet	0.5-1.0: Wet	---
	---	---	1.0-6.7: Moist	1.0-6.7: Moist	1.0-6.7: Moist	---	---	---	---	1.0-6.7: Moist	1.0-6.7: Moist	---
130A:												
Rudyard-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Moist
	---	---	0.5-1.0: Wet	0.5-1.0: Wet	0.5-1.0: Wet	---	---	---	---	0.5-1.0: Wet	0.5-1.0: Wet	---
	---	---	1.0-6.7: Moist	1.0-6.7: Moist	1.0-6.7: Moist	---	---	---	---	1.0-6.7: Moist	1.0-6.7: Moist	---
Pickford-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.5: Wet	0.0-1.5: Wet	0.0-1.5: Wet	0.0-0.5: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-1.5: Wet	0.0-1.5: Wet	0.0-6.7: Moist
	---	---	1.5-6.7: Moist	1.5-6.7: Moist	1.5-6.7: Moist	0.5-1.5: Wet	---	---	0.5-1.5: Wet	1.5-6.7: Moist	1.5-6.7: Moist	---
	---	---	---	---	---	1.5-6.7: Moist	---	---	1.5-6.7: Moist	---	---	---
132B:												
Sugar-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-2.5: Moist	0.0-1.5: Moist	0.0-2.0: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-6.7: Moist	0.0-2.5: Moist	0.0-2.5: Moist	0.0-6.7: Moist
	---	---	2.5-3.0: Wet	1.5-3.0: Wet	2.0-3.0: Wet	---	---	0.5-6.7: Moist	---	2.5-3.0: Wet	2.5-3.0: Wet	---
	---	---	3.0-6.7: Moist	3.0-6.7: Moist	3.0-6.7: Moist	---	---	---	---	3.0-6.7: Moist	3.0-6.7: Moist	---
133:												
Dorval-----	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-0.5: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet
	0.5-6.7: Wet	0.5-6.7: Wet	---	---	---	---	0.5-6.7: Wet	1.0-6.7: Wet	0.5-6.7: Wet	---	---	---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
143:												
Caffey-----	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-0.5: Moist	0.0-1.5: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-0.5: Moist
	0.5-6.7: Wet	0.5-6.7: Wet	---	---	---	0.5-6.7: Wet	1.5-6.7: Wet	2.0-6.7: Wet	1.5-6.7: Wet	0.5-6.7: Wet	0.5-6.7: Wet	0.5-6.7: Wet
146A:												
Allendale-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.5: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-6.7: Moist	0.0-2.0: Moist	0.0-1.0: Moist	0.0-6.7: Moist
	---	---	1.5-2.5: Wet	1.0-2.5: Wet	1.0-2.5: Wet	2.0-2.5: Wet	---	0.5-6.7: Moist	---	2.0-2.5: Wet	1.0-2.5: Wet	---
	---	---	2.5-6.7: Moist	2.5-6.7: Moist	2.5-6.7: Moist	2.5-6.7: Moist	---	---	---	2.5-6.7: Moist	2.5-6.7: Moist	---
Fibre-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-1.5: Wet	0.0-1.5: Wet	0.0-1.0: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-1.0: Moist
	---	---	0.5-1.5: Wet	1.5-6.7: Moist	1.5-6.7: Moist	1.0-1.5: Wet	---	---	---	0.5-1.5: Wet	0.5-1.5: Wet	1.0-1.5: Wet
	---	---	1.5-6.7: Moist	---	---	1.5-6.7: Moist	---	---	---	1.5-6.7: Moist	1.5-6.7: Moist	1.5-6.7: Moist
167D:												
Battydoe-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	0.5-6.7: Moist	1.0-6.7: Moist	---	---	---	---
Wallace-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Dry	0.0-2.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	1.0-6.7: Moist	2.0-6.7: Moist	---	---	---	---
173B:												
Paquin-----	0.0-5.0: Moist	0.0-5.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-3.5: Moist	0.0-1.5: Dry	0.0-2.5: Dry	0.0-4.5: Moist	0.0-3.0: Moist	0.0-3.0: Moist	0.0-4.0: Moist
	5.0-6.7: Wet	5.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	2.0-6.7: Wet	3.5-6.7: Wet	1.5-4.5: Moist	2.5-5.5: Moist	4.5-6.7: Wet	3.0-6.7: Wet	3.0-6.7: Wet	4.0-6.7: Wet
	---	---	---	---	---	---	4.5-6.7: Wet	5.5-6.7: Wet	---	---	---	---
Finch-----	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-0.5: Dry	0.0-2.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.5: Moist
	1.5-6.7: Wet	1.5-6.7: Wet	1.0-6.7: Wet	0.5-6.7: Wet	0.5-6.7: Wet	1.0-6.7: Wet	2.0-6.7: Wet	0.5-3.0: Moist	2.0-6.7: Wet	1.0-6.7: Wet	1.0-6.7: Wet	1.5-6.7: Wet
	---	---	---	---	---	---	---	3.0-6.7: Wet	---	---	---	---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
174B:												
Croswell-----	0.0-5.0:	0.0-5.0:	0.0-2.5:	0.0-2.0:	0.0-2.0:	0.0-3.5:	0.0-1.5:	0.0-2.5:	0.0-4.5:	0.0-3.0:	0.0-3.0:	0.0-4.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	5.0-6.7:	5.0-6.7:	2.5-6.7:	2.0-6.7:	2.0-6.7:	3.5-6.7:	1.5-4.5:	2.5-5.5:	4.5-6.7:	3.0-6.7:	3.0-6.7:	4.0-6.7:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	4.5-6.7:	5.5-6.7:	---	---	---	---
							Wet	Wet				
Spot-----	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-0.5:	0.0-1.5:	0.0-2.0:	0.0-1.0:	0.0-6.7:	0.0-6.7:	0.0-6.7:
	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Moist	Moist	Wet	Wet	Wet
	---	---	---	---	---	0.5-6.7:	1.5-6.7:	2.0-6.7:	1.0-6.7:	---	---	---
						Wet	Wet	Wet	Wet			
175D:												
Wallace-----	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-1.0:	0.0-2.0:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	---	---	---	---	---	---	1.0-6.7:	2.0-6.7:	---	---	---	---
							Moist	Moist				
Spot-----	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-0.5:	0.0-1.5:	0.0-2.0:	0.0-1.0:	0.0-6.7:	0.0-6.7:	0.0-6.7:
	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Moist	Moist	Wet	Wet	Wet
	---	---	---	---	---	0.5-6.7:	1.5-6.7:	2.0-6.7:	1.0-6.7:	---	---	---
						Wet	Wet	Wet	Wet			
175E:												
Wallace-----	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-1.0:	0.0-2.0:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	---	---	---	---	---	---	1.0-6.7:	2.0-6.7:	---	---	---	---
							Moist	Moist				
Spot-----	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-6.7:	0.0-0.5:	0.0-1.5:	0.0-2.0:	0.0-1.0:	0.0-6.7:	0.0-6.7:	0.0-6.7:
	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Moist	Moist	Wet	Wet	Wet
	---	---	---	---	---	0.5-6.7:	1.5-6.7:	2.0-6.7:	1.0-6.7:	---	---	---
						Wet	Wet	Wet	Wet			
176B:												
Paquin-----	0.0-5.0:	0.0-5.0:	0.0-2.5:	0.0-2.0:	0.0-2.0:	0.0-3.5:	0.0-1.5:	0.0-2.5:	0.0-4.5:	0.0-3.0:	0.0-3.0:	0.0-4.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	5.0-6.7:	5.0-6.7:	2.5-6.7:	2.0-6.7:	2.0-6.7:	3.5-6.7:	1.5-4.5:	2.5-5.5:	4.5-6.7:	3.0-6.7:	3.0-6.7:	4.0-6.7:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	4.5-6.7:	5.5-6.7:	---	---	---	---
							Wet	Wet				

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
176B: Spot-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
179B: Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
179D: Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
179E: Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
179F: Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
180B: Millecoquins----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.0: Moist 1.0-2.5: Wet 2.5-6.7: Moist	0.0-1.5: Moist 1.5-2.5: Wet 2.5-6.7: Moist	0.0-2.0: Moist 2.0-2.5: Wet 2.5-6.7: Moist	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.5: Wet 2.5-6.7: Moist	0.0-2.0: Moist 2.0-2.5: Wet 2.5-6.7: Moist	0.0-6.7: Moist ---
186D: Sporley-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
186E: Sporley-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
186F: Sporley-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
187B: Auger-----	0.0-5.5: Moist 5.5-6.7: Wet ---	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-2.5: Moist 2.5-6.7: Wet ---	0.0-3.0: Moist 3.0-6.7: Wet ---	0.0-4.5: Moist 4.5-6.7: Wet ---	0.0-0.5: Dry 0.5-6.0: Moist 6.0-6.7: Wet	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-5.0: Moist 5.0-6.7: Wet ---	0.0-4.0: Moist 4.0-6.7: Wet ---	0.0-4.0: Moist 4.0-6.7: Wet ---	0.0-4.5: Moist 4.5-6.7: Wet ---
188: Hendrie-----	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-2.0: Moist 2.0-6.7: Wet	0.0-1.5: Moist 1.5-6.7: Wet	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet
189A: Bodi-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet ---	0.0-1.5: Moist 1.5-2.0: Wet ---	0.0-1.5: Moist 1.5-2.0: Wet ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet ---	0.0-1.5: Moist 1.5-2.0: Wet ---	0.0-6.7: Moist ---
Chesbrough-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Moist 1.0-2.0: Wet 2.0-5.5: Moist 5.5-6.7: Wet	0.0-0.5: Moist 0.5-2.0: Wet 2.0-5.0: Moist 5.0-6.7: Wet	0.0-0.5: Moist 0.5-2.0: Wet 2.0-5.0: Moist 5.0-6.7: Wet	0.0-5.5: Moist 5.5-6.7: Wet ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Moist 1.0-2.0: Wet 2.0-5.5: Moist 5.5-6.7: Wet	0.0-1.0: Moist 1.0-2.0: Wet 2.0-5.5: Moist 5.5-6.7: Wet	0.0-6.0: Moist 6.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
190B:												
Bodi-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-0.5: Dry	0.0-6.7: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-6.7: Moist
	---	---	1.5-2.0: Wet	1.5-2.0: Wet	1.5-2.0: Wet	---	0.5-6.7: Moist	0.5-6.7: Moist	---	1.5-2.0: Wet	1.5-2.0: Wet	---
	---	---	2.0-6.7: Moist	2.0-6.7: Moist	2.0-6.7: Moist	---	---	---	---	2.0-6.7: Moist	2.0-6.7: Moist	---
191D:												
Widgeon-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-6.7: Moist
	---	---	1.5-2.0: Wet	1.5-2.0: Wet	1.5-2.0: Wet	---	0.5-6.7: Moist	1.0-6.7: Moist	---	1.5-2.0: Wet	1.5-2.0: Wet	---
	---	---	2.0-6.7: Moist	2.0-6.7: Moist	2.0-6.7: Moist	---	---	---	---	2.0-6.7: Moist	2.0-6.7: Moist	---
Kalkaska-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-2.0: Dry	0.0-3.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	2.0-6.7: Moist	3.0-6.7: Moist	---	---	---	---
193A:												
Annanias-----	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-2.5: Moist	0.0-3.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-1.5: Moist
	1.5-6.7: Wet	1.5-6.7: Wet	1.0-6.7: Wet	0.5-6.7: Wet	1.0-6.7: Wet	2.0-6.7: Wet	2.5-6.7: Wet	3.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	1.5-6.7: Wet	1.5-6.7: Wet
194A:												
Hendrie-----	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-0.5: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-6.7: Wet	0.0-0.5: Moist	0.0-0.5: Moist
	0.5-6.7: Wet	0.5-6.7: Wet	---	---	---	0.5-6.7: Wet	1.0-6.7: Wet	2.0-6.7: Wet	1.5-6.7: Wet	---	0.5-6.7: Wet	0.5-6.7: Wet
Annanias-----	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-2.5: Moist	0.0-3.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-1.5: Moist
	1.5-6.7: Wet	1.5-6.7: Wet	1.0-6.7: Wet	0.5-6.7: Wet	1.0-6.7: Wet	2.0-6.7: Wet	2.5-6.7: Wet	3.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	1.5-6.7: Wet	1.5-6.7: Wet

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
195A:												
Chesbrough-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-5.5: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-6.0: Moist
	---	---	1.0-2.0: Wet	0.5-2.0: Wet	0.5-2.0: Wet	5.5-6.7: Wet	---	---	---	1.0-2.0: Wet	1.0-2.0: Wet	6.0-6.7: Wet
	---	---	2.0-5.5: Moist	2.0-5.0: Moist	2.0-5.0: Moist	---	---	---	---	2.0-5.5: Moist	2.0-5.5: Moist	---
	---	---	5.5-6.7: Wet	5.0-6.7: Wet	5.0-6.7: Wet	---	---	---	---	5.5-6.7: Wet	5.5-6.7: Wet	---
197D:												
Zandi-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	0.5-6.7: Moist	1.0-6.7: Moist	---	---	---	---
197E:												
Zandi-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	0.5-6.7: Moist	1.0-6.7: Moist	---	---	---	---
198B:												
Vilas-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Dry	0.0-2.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	1.0-6.7: Moist	2.0-6.7: Moist	---	---	---	---
198D:												
Vilas-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Dry	0.0-2.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	---	---	---	---	---	---	1.0-6.7: Moist	2.0-6.7: Moist	---	---	---	---
199B:												
Auger-----	0.0-5.5: Moist	0.0-5.0: Moist	0.0-3.0: Moist	0.0-2.5: Moist	0.0-3.0: Moist	0.0-4.5: Moist	0.0-0.5: Dry	0.0-0.5: Dry	0.0-5.0: Moist	0.0-4.0: Moist	0.0-4.0: Moist	0.0-4.5: Moist
	5.5-6.7: Wet	5.0-6.7: Wet	3.0-6.7: Wet	2.5-6.7: Wet	3.0-6.7: Wet	4.5-6.7: Wet	0.5-6.0: Moist	0.5-6.7: Moist	5.0-6.7: Wet	4.0-6.7: Wet	4.0-6.7: Wet	4.5-6.7: Wet
	---	---	---	---	---	---	6.0-6.7: Wet	---	---	---	---	---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
199B:												
Annanias-----	0.0-1.5: Moist	0.0-1.5: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-1.0: Moist	0.0-2.0: Moist	0.0-2.5: Moist	0.0-3.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-1.5: Moist
	1.5-6.7: Wet	1.5-6.7: Wet	1.0-6.7: Wet	0.5-6.7: Wet	1.0-6.7: Wet	2.0-6.7: Wet	2.5-6.7: Wet	3.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	1.5-6.7: Wet	1.5-6.7: Wet
200B:												
Pence-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	0.5-6.7: Moist	1.0-6.7: Moist	--- ---	--- ---	--- ---	--- ---
200D:												
Pence-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	0.5-6.7: Moist	1.0-6.7: Moist	--- ---	--- ---	--- ---	--- ---
200E:												
Pence-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	0.5-6.7: Moist	1.0-6.7: Moist	--- ---	--- ---	--- ---	--- ---
201B:												
Crowell, rarely flooded-----	0.0-5.0: Moist	0.0-5.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-3.5: Moist	0.0-1.5: Dry	0.0-2.5: Dry	0.0-4.5: Moist	0.0-3.0: Moist	0.0-3.0: Moist	0.0-4.0: Moist
	5.0-6.7: Wet	5.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	2.0-6.7: Wet	3.5-6.7: Wet	1.5-4.5: Moist	2.5-5.5: Moist	4.5-6.7: Wet	3.0-6.7: Wet	3.0-6.7: Wet	4.0-6.7: Wet
	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	4.5-6.7: Wet	5.5-6.7: Wet	--- ---	--- ---	--- ---	--- ---
Deford, frequently flooded-----	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet	0.0-0.5: Moist	0.0-1.5: Moist	0.0-2.0: Moist	0.0-1.0: Moist	0.0-6.7: Wet	0.0-6.7: Wet	0.0-6.7: Wet
	--- ---	--- ---	--- ---	--- ---	--- ---	0.5-6.7: Wet	1.5-6.7: Wet	2.0-6.7: Wet	1.0-6.7: Wet	--- ---	--- ---	--- ---
202B:												
Whitewash-----	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-1.0: Dry	0.0-1.5: Dry	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist	0.0-6.7: Moist
	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	1.0-6.7: Moist	1.5-6.7: Moist	--- ---	--- ---	--- ---	--- ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
203D: Frohling-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
203E: Frohling-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
204: Gogomain-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.7: Moist	0.0-1.5: Wet 1.5-6.7: Moist	0.0-1.5: Wet 1.5-6.7: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.7: Moist	0.0-1.5: Wet 1.5-6.7: Moist	0.0-1.5: Wet 1.5-6.7: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.7: Moist
205B: Kalkaska, burned	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
205D: Kalkaska, burned	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
206B: Deerton-----	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-1.0: Dry 1.0-4.6: Moist	0.0-2.0: Dry 2.0-4.6: Moist	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---	0.0-4.6: Moist ---
211D: Frohling-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
211D: Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
211E: Frohling-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist	0.0-1.0: Dry 1.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
212: Markey-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
214D: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Markey-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---
214E: Rousseau-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Markey-----	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-0.5: Moist 0.5-6.7: Wet	0.0-1.0: Moist 1.0-6.7: Wet	0.0-0.5: Moist 0.5-6.7: Wet	0.0-6.7: Wet ---	0.0-6.7: Wet ---	0.0-6.7: Wet ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
215B:												
Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Alcona-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
215D:												
Wallace-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-2.0: Dry 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
Alcona-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.0: Dry 1.0-6.7: Moist	0.0-1.5: Dry 1.5-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
246B:												
Garlic-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
246D:												
Garlic-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-2.0: Dry 2.0-6.7: Moist	0.0-3.0: Dry 3.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---
286B:												
Fence-----	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-0.5: Dry 0.5-6.7: Moist ---	0.0-6.7: Moist ---	0.0-6.7: Moist ---	0.0-1.5: Moist 1.5-2.0: Wet 2.0-6.7: Moist	0.0-6.7: Moist ---

Table 19.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
287B:												
Noseum-----	0.0-5.0: Moist	0.0-5.0: Moist	0.0-2.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-3.5: Moist	0.0-1.0: Dry	0.0-1.5: Dry	0.0-5.0: Moist	0.0-3.3: Moist	0.0-2.5: Moist	0.0-4.5: Moist
	5.0-6.7: Wet	5.0-6.7: Wet	2.5-6.7: Wet	2.0-6.7: Wet	2.0-6.7: Wet	3.5-6.7: Wet	1.0-4.5: Moist	1.5-5.5: Moist	5.0-6.7: Wet	3.3-6.7: Wet	2.5-6.7: Wet	4.5-6.7: Wet
	---	---	---	---	---	---	4.5-6.7: Wet	5.5-6.7: Wet	---	---	---	---
300.												
Beaches												
W.												
Water												

Table 20.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
10D: Ontonagon-----	D	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
15B: Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
15D: Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
15E: Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
15F: Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
16B: Graveraet-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	1.5	2.0	Perched	---	---	None	---	None
		Apr	1.0	2.0	Perched	---	---	None	---	None
		May	1.5	2.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	1.5	2.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
17C: Deer Park-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
17E: Deer Park-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
17F: Deer Park-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
18B: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
18D: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
18E: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
18F: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
19B: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
19D: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
19E: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
19F: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
20B: Crowswell-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
21A: Finch-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5	>6.0	Apparent	---	---	None	---	None
22: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
23: Leafriver-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar-May	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
24B: Springlake-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
29A: Solona-----	C	Jan-Mar	1.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	2.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.5	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.5	>6.0	Apparent	---	---	None	---	None
		Oct	1.5	>6.0	Apparent	---	---	None	---	None
		Nov-Dec	1.0	>6.0	Apparent	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
30: Kinross-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		May	0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
31B: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
31D: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
31E: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
31F: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
32A: Allendale-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	1.5	2.5	Perched	---	---	None	---	None
		Apr-May	1.0	2.5	Perched	---	---	None	---	None
		Jun	2.0	2.5	Perched	---	---	None	---	None
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	2.0	2.5	Perched	---	---	None	---	None
		Nov	1.0	2.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
35. Histosols and Aquents										
36: Carbondale-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Lupton-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
36: Tawas-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
37: Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
Greenwood-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
Loxley-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
45D: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
45E: Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding		
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
45E: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
46B: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
46D: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
46E: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
46F: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
47B: Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
47D: Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
53B: Menominee, sandy substratum-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
57B: Amadon-----	D	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Longrie----- Rock outcrop.	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
57D: Amadon-----	D	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Longrie----- Rock outcrop.	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
57E: Amadon-----	D	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Longrie----- Rock outcrop.	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
60A: Kinross-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		May	0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Au Gres-----	B	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5-6.0	>6.0	Apparent	---	---	None	---	None
61B: Paquin-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
65B: Rubicon, organic surface-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
65D: Rubicon, organic surface-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
65E: Rubicon, organic surface-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
66B: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kaks-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
66D: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kaks-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
66E: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kaks-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding		
			Upper limit Ft	Lower limit Ft	Kind of water table	Surface water depth Ft	Duration	Frequency	Duration	Frequency
66F:										
Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kaks-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
74B:										
Menominee, sandy substratum-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Graveraet-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	1.5	2.0	Perched	---	---	None	---	None
		Apr	1.0	2.0	Perched	---	---	None	---	None
		May	1.5	2.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	1.5	2.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
75D:										
Dillingham-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
75E:										
Dillingham-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
75F:										
Dillingham-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
76D:										
Menominee, sandy substratum-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
76E:										
Menominee, sandy substratum-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
84B:										
Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Alcona-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
84D:										
Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Alcona-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
84E:										
Liminga-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Alcona-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
85B: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Okeefe-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
85D: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Okeefe-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
85E: Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Okeefe-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
88B: Croswell-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
Au Gres-----	B	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5-6.0	>6.0	Apparent	---	---	None	---	None
89A: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Finch-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5	>6.0	Apparent	---	---	None	---	None
90D: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
90D: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
90E: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
90F: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
91D: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
91E: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
91F: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
93F: Ontonagon-----	D	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Pickford, occasionally flooded-----	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Apr	0.0	1.5	Perched	---	---	None	Brief	Occasional
		May	0.0	1.5	Perched	---	---	None	---	None
		Jun	0.5	1.5	Perched	---	---	None	---	None
		Jul-Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	0.5	1.5	Perched	---	---	None	---	None
		Oct	0.0	1.5	Perched	---	---	None	Brief	Occasional
		Nov	0.0	1.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
94A: Tawas-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Finch-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5	>6.0	Apparent	---	---	None	---	None
102: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
104B: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
104D: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
104E: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
109D: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
109F: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
110D: Au Gres-----	B	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5-6.0	>6.0	Apparent	---	---	None	---	None
Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
110E: Au Gres-----	B	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5-6.0	>6.0	Apparent	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
110E: Dawson-----	D	Jan-Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Aug	0.5	>6.0	Apparent	---	---	None	---	None
		Sep	0.0	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Dec	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
Rubicon-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
116. Udipsamments and Udorthents										
117D: Manistee, sandy substratum-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
120B: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
120D: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
120E: McMillan-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Trenary-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
122. Pits, quarry										
126: Pickford-----	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	0.0	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Apr	0.0	1.5	Perched	0.0-0.5	Long	Frequent	---	None
		May	0.0	1.5	Perched	0.0-0.5	Brief	Frequent	---	None
		Jun	0.5	1.5	Perched	---	---	None	---	None
		Jul-Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	0.5	1.5	Perched	---	---	None	---	None
		Oct	0.0	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Nov	0.0	1.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
129A: Rudyard-----	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-May	0.5	1.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	0.5	1.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
130A: Rudyard-----	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-May	0.5	1.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	0.5	1.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
Pickford-----	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	0.0	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Apr	0.0	1.5	Perched	0.0-0.5	Long	Frequent	---	None
		May	0.0	1.5	Perched	0.0-0.5	Brief	Frequent	---	None
		Jun	0.5	1.5	Perched	---	---	None	---	None
		Jul-Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	0.5	1.5	Perched	---	---	None	---	None
		Oct	0.0	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Nov	0.0	1.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
132B: Sugar-----	B	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	2.5	3.0	Perched	---	---	None	---	None
		Apr	1.5	3.0	Perched	---	---	None	---	None
		May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	2.5	3.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
133: Dorval-----	B/D	Jan-Feb	0.5	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
143: Caffey-----	C	Jan-Feb	0.5	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.5	>6.0	Apparent	---	---	None	---	None
146A: Allendale-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	1.5	2.5	Perched	---	---	None	---	None
		Apr-May	1.0	2.5	Perched	---	---	None	---	None
		Jun	2.0	2.5	Perched	---	---	None	---	None
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	2.0	2.5	Perched	---	---	None	---	None
		Nov	1.0	2.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
146A: Fibre-----	B/D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	0.5	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	1.5	Perched	0.0-0.5	Brief	Frequent	---	None
		Jun	1.0	1.5	Perched	---	---	None	---	None
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	0.5	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Nov	0.5	1.5	Perched	---	---	None	---	None
		Dec	1.0	1.5	Perched	---	---	None	---	None
167D: Battydoe-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
173B: Paquin-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
Finch-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.0	Apparent	---	---	None	---	None
		Jun	1.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.0	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.0	Apparent	---	---	None	---	None
		Dec	1.5	>6.0	Apparent	---	---	None	---	None
174B: Crowell-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
175D: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
175D: Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
175E: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
176B: Paquin-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	---	None
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
Spot-----	A/D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
179B: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
179D: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
179E: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
179F: Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind of water table	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
180B: Millecoquins-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	1.5	2.0	Perched	---	---	None	---	None
		Apr	1.0	2.5	Perched	---	---	None	---	None
		May	1.5	2.5	Perched	---	---	None	---	None
		Jun	2.0	2.5	Perched	---	---	None	---	None
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	1.5	2.5	Perched	---	---	None	---	None
		Nov	2.0	2.5	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
186D: Sporley-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
186E: Sporley-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
186F: Sporley-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
187B: Auger-----	B	Jan	5.5	>6.0	Apparent	---	---	None	---	None
		Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	3.0	>6.0	Apparent	---	---	None	---	None
		Apr	2.5	>6.0	Apparent	---	---	None	---	None
		May	3.0	>6.0	Apparent	---	---	None	---	None
		Jun	4.5	>6.0	Apparent	---	---	None	---	None
		Jul	6.0	>6.0	Apparent	---	---	None	---	None
		Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	5.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	4.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.5	>6.0	Apparent	---	---	None	---	None
188: Hendrie-----	D	Jan-Feb	0.5	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.0	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.5	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.5	>6.0	Apparent	---	---	None	---	None
189A: Bodi-----	B	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-May	1.5	2.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	1.5	2.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit Ft	Lower limit Ft	Kind of water table	Surface water depth Ft	Duration	Frequency	Duration	Frequency
189A: Chesbrough-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	5.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	2.0	Perched	---	---	None	---	None
		Apr	5.0	>6.0	Apparent	---	---	None	---	None
		Apr	0.5	2.0	Perched	---	---	None	---	None
		May	0.5	2.0	Perched	---	---	None	---	None
		May	5.0	>6.0	Apparent	---	---	None	---	None
		Jun	5.5	>6.0	Apparent	---	---	None	---	None
		Jun								
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	5.5	>6.0	Apparent	---	---	None	---	None
		Oct	1.0	2.0	Perched	---	---	None	---	None
		Nov	1.0	2.0	Perched	---	---	None	---	None
		Nov	5.5	>6.0	Apparent	---	---	None	---	None
		Dec	6.0	>6.0	Apparent	---	---	None	---	None
		Dec								
190B: Bodi-----	B	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-May	1.5	2.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	1.5	2.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
191D: Widgeon-----	B	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-May	1.5	2.0	Perched	---	---	None	---	None
		Jun-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct-Nov	1.5	2.0	Perched	---	---	None	---	None
		Dec	>6.0	>6.0	---	---	---	None	---	None
Kalkaska-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
193A: Annaias-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr	0.5	>6.0	Apparent	---	---	None	---	None
		May	1.0	>6.0	Apparent	---	---	None	---	None
		Jun	2.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.5	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.5	>6.0	Apparent	---	---	None	---	None
		Oct	2.0	>6.0	Apparent	---	---	None	---	None
		Nov-Dec	1.5	>6.0	Apparent	---	---	None	---	None
194A: Hendrie-----	D	Jan-Feb	0.5	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.0	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.5	>6.0	Apparent	---	---	None	---	None
		Oct	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.5	>6.0	Apparent	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit Ft	Lower limit Ft	Kind of water table	Surface water depth Ft	Duration	Frequency	Duration	Frequency
194A: Annaias-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr	0.5	>6.0	Apparent	---	---	None	---	None
		May	1.0	>6.0	Apparent	---	---	None	---	None
		Jun	2.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.5	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.5	>6.0	Apparent	---	---	None	---	None
		Oct	2.0	>6.0	Apparent	---	---	None	---	None
		Nov-Dec	1.5	>6.0	Apparent	---	---	None	---	None
195A: Chesbrough-----	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	5.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	2.0	Perched	---	---	None	---	None
		Apr	5.0	>6.0	Apparent	---	---	None	---	None
		Apr	0.5	2.0	Perched	---	---	None	---	None
		May	0.5	2.0	Perched	---	---	None	---	None
		May	5.0	>6.0	Apparent	---	---	None	---	None
		Jun	5.5	>6.0	Apparent	---	---	None	---	None
		Jun								
		Jul-Sep	>6.0	>6.0	---	---	---	None	---	None
		Oct	5.5	>6.0	Apparent	---	---	None	---	None
		Oct	1.0	2.0	Perched	---	---	None	---	None
		Nov	1.0	2.0	Perched	---	---	None	---	None
		Nov	5.5	>6.0	Apparent	---	---	None	---	None
		Dec	6.0	>6.0	Apparent	---	---	None	---	None
		Dec								
197D: Zandi-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
197E: Zandi-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
198B: Vilas-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
198D: Vilas-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
199B: Auger-----	B	Jan	5.5	>6.0	Apparent	---	---	None	---	None
		Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	3.0	>6.0	Apparent	---	---	None	---	None
		Apr	2.5	>6.0	Apparent	---	---	None	---	None
		May	3.0	>6.0	Apparent	---	---	None	---	None
		Jun	4.5	>6.0	Apparent	---	---	None	---	None
		Jul	6.0	>6.0	Apparent	---	---	None	---	None
		Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	5.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	4.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.5	>6.0	Apparent	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding		
			Upper limit Ft	Lower limit Ft	Kind of water table	Surface water depth Ft	Duration	Frequency	Duration	Frequency
199B: Annantias-----	C	Jan-Feb	1.5	>6.0	Apparent	---	---	None	---	None
		Mar	1.0	>6.0	Apparent	---	---	None	---	None
		Apr	0.5	>6.0	Apparent	---	---	None	---	None
		May	1.0	>6.0	Apparent	---	---	None	---	None
		Jun	2.0	>6.0	Apparent	---	---	None	---	None
		Jul	2.5	>6.0	Apparent	---	---	None	---	None
		Aug	3.0	>6.0	Apparent	---	---	None	---	None
		Sep	2.5	>6.0	Apparent	---	---	None	---	None
		Oct	2.0	>6.0	Apparent	---	---	None	---	None
		Nov-Dec	1.5	>6.0	Apparent	---	---	None	---	None
200B: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
200D: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
200E: Pence-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
201B: Crowell, rarely flooded-----	A	Jan-Feb	5.0	>6.0	Apparent	---	---	None	---	None
		Mar	2.5	>6.0	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.0	Apparent	---	---	None	Brief	Rare
		Jun	3.5	>6.0	Apparent	---	---	None	---	None
		Jul	4.5	>6.0	Apparent	---	---	None	---	None
		Aug	5.5	>6.0	Apparent	---	---	None	---	None
		Sep	4.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	3.0	>6.0	Apparent	---	---	None	---	None
		Dec	4.0	>6.0	Apparent	---	---	None	---	None
Deford, frequently flooded-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	---	---	None	Brief	Occasional
		Apr-May	0.0	>6.0	Apparent	---	---	None	Long	Frequent
		Jun	0.5	>6.0	Apparent	---	---	None	---	None
		Jul	1.5	>6.0	Apparent	---	---	None	---	None
		Aug	2.0	>6.0	Apparent	---	---	None	---	None
		Sep	1.0	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	---	---	None	Brief	Frequent
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
202B: Whitewash-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
203D: Frohling-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
203E: Frohling-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 20.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit Ft	Lower limit Ft	Kind of water table	Surface water depth Ft	Duration	Frequency	Duration	Frequency
204: Gogomain-----	B/D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar	0.5	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Apr	0.0	1.5	Perched	0.0-0.5	Long	Frequent	---	None
		May	0.0	1.5	Perched	0.0-0.5	Brief	Frequent	---	None
		Jun	1.0	1.5	Perched	---	---	None	---	None
		Jul-Aug	>6.0	>6.0	---	---	---	None	---	None
		Sep	1.0	1.5	Perched	---	---	None	---	None
		Oct	0.0	1.5	Perched	0.0-0.5	Brief	Occasional	---	None
		Nov	0.0	1.5	Perched	---	---	None	---	None
		Dec	0.5	1.5	Perched	---	---	None	---	None
205B: Kaskaska, burned-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
205D: Kaskaska, burned-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
206B: Deerton-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
211D: Frohling-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
211E: Frohling-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wallace-----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
212: Markey-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
214D: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Markey-----	D	Jan-Feb	0.0	>6.0	Apparent	---	---	None	---	None
		Mar	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Apr-May	0.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul	0.5	>6.0	Apparent	---	---	None	---	None
		Aug	1.0	>6.0	Apparent	---	---	None	---	None
		Sep	0.5	>6.0	Apparent	---	---	None	---	None
		Oct-Nov	0.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0	>6.0	Apparent	---	---	None	---	None
214E: Rousseau-----	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 21.--Classification of the Soils

Soil name	Family or higher taxonomic class
Alcona-----	Coarse-loamy, mixed, superactive, frigid Alfic Haplorthods
Allendale-----	Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods
Amadon-----	Loamy, mixed, superactive, frigid Lithic Haplorthods
Annanias-----	Coarse-silty, isotic, frigid Typic Endoaquods
Au Gres-----	Sandy, mixed, frigid Typic Endoaquods
Auger-----	Coarse-silty, isotic, frigid Oxyaquic Haplorthods
Battydoe-----	Coarse-loamy, mixed, semiactive, frigid Typic Haplorthods
Bodi-----	Coarse-silty over sandy or sandy-skeletal, isotic, frigid Oxyaquic Fragiorthods
Caffey-----	Sandy over loamy, mixed, semiactive, nonacid, frigid Aerice Endoaquents
Carbondale-----	Euic, frigid Hemic Haplosaprists
Chesbrough-----	Coarse-loamy, isotic, frigid Typic Fragiaquods
Croswell-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Dawson-----	Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists
Deer Park-----	Mixed, frigid Spodic Udipsamments
Deerton-----	Sandy, mixed, frigid Typic Haplorthods
Deford-----	Mixed, frigid Typic Psammaquents
Dillingham-----	Sandy, isotic, frigid Typic Fragiorthods
Dorval-----	Clayey, mixed, euic, frigid Terric Haplosaprists
Fence-----	Coarse-silty, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Fibre-----	Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods
Finch-----	Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
Frohling-----	Coarse-loamy, mixed, active, frigid Alfic Fragiorthods
Garlic-----	Sandy, mixed, frigid, ortstein Typic Haplorthods
Gogomain-----	Coarse-loamy over clayey, mixed, active, nonacid, frigid Aerice Endoaquents
Graveraet-----	Coarse-loamy, mixed, active, frigid Alfic Oxyaquic Fragiorthods
Greenwood-----	Dysic, frigid Typic Haplohemists
Hendrie-----	Coarse-silty, mixed, superactive, nonacid, frigid Aerice Endoaquents
Kaks-----	Sandy, mixed, frigid Entic Hapludolls
Kalkaska-----	Sandy, mixed, frigid Typic Haplorthods
Kinross-----	Sandy, mixed, frigid Typic Endoaquods
Leafriver-----	Sandy, mixed, frigid Histic Humaquents
Liminga-----	Sandy, mixed, frigid Typic Haplorthods
Longrie-----	Coarse-loamy, mixed, superactive, frigid Typic Haplorthods
Loxley-----	Dysic, frigid Typic Haplosaprists
Lupton-----	Euic, frigid Typic Haplosaprists
Manistee-----	Sandy over clayey, mixed, active, frigid Alfic Haplorthods
Markey-----	Sandy or sandy-skeletal, mixed, euic Terric Haplosaprists
McMillan-----	Sandy, mixed, frigid Lamellic Haplorthods
Menominee-----	Sandy over loamy, mixed, active, frigid Alfic Haplorthods
Millecoquins-----	Fine-silty, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Noseum-----	Sandy, isotic, frigid Oxyaquic Haplorthods
Okeefe-----	Sandy over loamy, isotic, frigid Typic Haplorthods
Ontonagon-----	Very-fine, mixed, frigid Haplic Glossudalfs
Paquin-----	Sandy, mixed, frigid, shallow, ortstein Typic Durorthods
Pence-----	Sandy, mixed, frigid Typic Haplorthods
Pickford-----	Fine, mixed, active, nonacid, frigid Aerice Epiaquents
Rousseau-----	Sandy, mixed, frigid Entic Haplorthods
Rubicon-----	Sandy, mixed, frigid Entic Haplorthods
Rudyard-----	Very-fine, mixed, active, frigid Aquic Glossudalfs
Solona-----	Coarse-loamy, mixed, superactive, frigid Aquic Hapludalfs
Sporley-----	Coarse-silty, mixed, active, frigid Alfic Haplorthods
Spot-----	Sandy, mixed, frigid, shallow, ortstein Typic Duraquods
Springlake-----	Sandy, mixed, frigid Typic Haplorthods
Sugar-----	Coarse-silty over clayey, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Tawas-----	Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists
Trenary-----	Coarse-loamy, mixed, semiactive, frigid Alfic Haplorthods
Vilas-----	Sandy, mixed, frigid Entic Haplorthods
Wallace-----	Sandy, mixed, frigid, shallow, ortstein Typic Durorthods

Table 21.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Whitewash-----	Sandy, mixed, frigid Typic Udifluents
Widgeon-----	Coarse-silty, isotic, frigid Oxyaquic Haplorthods
Zandi-----	Coarse-loamy, isotic, frigid Lamellic Haplorthods

Interpretive Groups

Interpretive Groups

(Unless otherwise indicated, a complex is treated as a single management unit in the land capability classification column. See text for explanations of the groups. Absence of an entry indicates that the map unit is not suited to the intended use or that no interpretive group is assigned)

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/secondary)
10D----- Ontonagon	4e	0a	Not prime farmland	Not hydric	ATD
15B----- Liminga	3s	5a	Not prime farmland	Not hydric	ATD
15D----- Liminga	3e	5a	Not prime farmland	Not hydric	ATD
15E----- Liminga	6e	5a	Not prime farmland	Not hydric	ATD
15F----- Liminga	7e	5a	Not prime farmland	Not hydric	ATD
16B----- Graveraet	2e	3a-f	Not prime farmland	Not hydric	AVO/AVO-A
17C----- Deer Park	7s	5.3a	Not prime farmland	Not hydric	PVC/QAE
17E----- Deer Park	7s	5.3a	Not prime farmland	Not hydric	PVC/QAE
17F----- Deer Park	7s	5.3a	Not prime farmland	Not hydric	PVC/QAE
18B----- Rubicon	6s	5.3a	Not prime farmland	Not hydric	AQVac
18D----- Rubicon	7s	5.3a	Not prime farmland	Not hydric	AQVac
18E----- Rubicon	7s	5.3a	Not prime farmland	Not hydric	AQVac
18F----- Rubicon	7s	5.3a	Not prime farmland	Not hydric	AQVac
19B----- Kalkaska	4s	5a	Not prime farmland	Not hydric	ATD
19D----- Kalkaska	6s	5a	Not prime farmland	Not hydric	ATD
19E----- Kalkaska	7s	5a	Not prime farmland	Not hydric	ATD
19F----- Kalkaska	7s	5a	Not prime farmland	Not hydric	ATD
20B----- Crowell	4s	5a	Not prime farmland	Not hydric	AQVac

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
21A----- Finch	4w	5b-h	Not prime farmland	Not hydric	TMC-Vac
22----- Spot	5w	5c-h	Not prime farmland	Hydric	TTS
23----- Leafriver	6w	5c	Not prime farmland	Hydric	FI
24B----- Springlake	4s	5a	Not prime farmland	Not hydric	AVO
29A----- Solona	2w	3b	Prime farmland where drained	Not hydric	AVO-CI/TMC
30----- Kinross	6w	5c-a	Not prime farmland	Hydric	TTS
31B----- McMillan	3s	4a	Not prime farmland	Not hydric	AVO/ATD
31D----- McMillan	4e	4a	Not prime farmland	Not hydric	AVO/ATD
31E----- McMillan	6e	4a	Not prime farmland	Not hydric	AVO/ATD
31F----- McMillan	7e	4a	Not prime farmland	Not hydric	AVO/ATD
32A----- Allendale	3w	4/1b	Not prime farmland	Not hydric	TMC-D
33. Pits					
35----- Histosols----- Aquents-----	8w	---	Not prime farmland	Hydric	---
36----- Carbondale----- Lupton----- Tawas-----	6w	Mc Mc M/4c	Not prime farmland	Hydric	TTM/TTS
37----- Dawson----- Greenwood----- Loxley-----	7w	M/4c-a Mc-a Mc-a	Not prime farmland	Hydric	PCS

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
45D----- Rubicon----- Spot-----	7s	5.3a 5c-h	Not prime farmland	Not hydric Hydric	AQVac TTS
45E----- Rubicon----- Spot-----	7s	5.3a 5c-h	Not prime farmland	Not hydric Hydric	AQVac TTS
46B----- Kalkaska	3s	4a	Not prime farmland	Not hydric	ATD
46D----- Kalkaska	3s	4a	Not prime farmland	Not hydric	ATD
46E----- Kalkaska	6s	4a	Not prime farmland	Not hydric	ATD
46F----- Kalkaska	7s	4a	Not prime farmland	Not hydric	ATD
47B----- Trenary	2e	3a	Prime farmland	Not hydric	AVO
47D----- Trenary	4e	3a	Not prime farmland	Not hydric	AVO
53B----- Menominee, sandy substratum	3s	4/2a	Not prime farmland	Not hydric	AVO
57B----- Amadon----- Longrie----- Rock outcrop.	3s	Ra 3/Ra	Not prime farmland	Not hydric Not hydric	ATD AVO
57D----- Amadon----- Longrie----- Rock outcrop.	4e	Ra 3/Ra	Not prime farmland	Not hydric Not hydric	ATD AVO
57E----- Amadon----- Longrie----- Rock outcrop.	7e	Ra 3/Ra	Not prime farmland	Not hydric Not hydric	ATD AVO
60A----- Kinross----- Au Gres-----	6w	5c-a 5b	Not prime farmland	Hydric Not hydric	TTS TMC-Vac

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
61B----- Paquin	6s	5a-h	Not prime farmland	Not hydric	ATD
65B----- Rubicon, organic surface	6s	5.3a	Not prime farmland	Not hydric	AQVac
65D----- Rubicon, organic surface	7s	5.3a	Not prime farmland	Not hydric	AQVac
65E----- Rubicon, organic surface	7s	5.3a	Not prime farmland	Not hydric	AQVac
66B----- Kalkaska----- Kaks-----	4s	5a 4a	Not prime farmland	Not hydric Not hydric	ATD AVO
66D----- Kalkaska----- Kaks-----	6s	5a 4a	Not prime farmland	Not hydric Not hydric	ATD AVO
66E----- Kalkaska----- Kaks-----	7s	5a 4a	Not prime farmland	Not hydric Not hydric	ATD AVO
66F----- Kalkaska----- Kaks-----	7s	5a 4a	Not prime farmland	Not hydric Not hydric	ATD AVO
74B----- Menominee, sandy substratum----- Graveraet-----	3s	4/2a 3a-f	Not prime farmland	Not hydric Not hydric	AVO AVO/AVO-A
75D----- Dillingham----- Kalkaska-----	6s	4a 5a	Not prime farmland	Not hydric Not hydric	ATD ATD
75E----- Dillingham----- Kalkaska-----	7s	4a 5a	Not prime farmland	Not hydric Not hydric	ATD ATD
75F----- Dillingham----- Kalkaska-----	7s	4a 5a	Not prime farmland	Not hydric Not hydric	ATD ATD

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
76D----- Menominee, sandy substratum----- Trenary-----	4s	4/2a 3a	Not prime farmland	Not hydric Not hydric	AVO AVO
76E----- Menominee, sandy substratum----- Trenary-----	6s	4/2a 3a	Not prime farmland	Not hydric Not hydric	AVO AVO
84B----- Liminga----- Alcona-----	3s	5a 3a	Not prime farmland	Not hydric Not hydric	ATD AVO
84D----- Liminga----- Alcona-----	3s	5a 3a	Not prime farmland	Not hydric Not hydric	ATD AVO
84E----- Liminga----- Alcona-----	6e	5a 3e	Not prime farmland	Not hydric Not hydric	ATD AVO
85B----- Kalkaska----- Okeefe-----	4s	5a 4/2a	Not prime farmland	Not hydric Not hydric	ATD ATD
85D----- Kalkaska----- Okeefe-----	6s	5a 4/2a	Not prime farmland	Not hydric Not hydric	ATD ATD
85E----- Kalkaska----- Okeefe-----	7s	5a 4/2a	Not prime farmland	Not hydric Not hydric	ATD ATD
88B----- Crowell----- Au Gres-----	4s	5a 5b	Not prime farmland	Not hydric Not hydric	AQVac TMC-Vac
89A----- Spot----- Finch-----	5w	5c-h 5b-h	Not prime farmland	Hydric Not hydric	TTS TMC-Vac

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
90D----- Rousseau----- Spot-----	4e	5a 5c-h	Not prime farmland	Not hydric Hydric	AQVac TTS
90E----- Rousseau----- Spot-----	6e	5a 5c-h	Not prime farmland	Not hydric Hydric	AQVac TTS
90F----- Rousseau----- Spot-----	7e	5a 5c-h	Not prime farmland	Not hydric Hydric	AQVac TTS
91D----- Rousseau	4e	5a	Not prime farmland	Not hydric	AQVac
91E----- Rousseau	6e	5a	Not prime farmland	Not hydric	AQVac
91F----- Rousseau	7e	5a	Not prime farmland	Not hydric	AQVac
93F----- Ontonagon----- Pickford, occasionally flooded-----	7e	0a 1c	Not prime farmland	Not hydric Hydric	ATD TTP
94A----- Tawas----- Spot----- Finch-----	8w	M/4c 5c-h 5b-h	Not prime farmland	Hydric Hydric Not hydric	TTS TTS TMC-Vac
102----- Spot----- Dawson-----	5w	5c-h M/4c-a	Not prime farmland	Hydric Hydric	TTS PCS
104B----- Pence	2e	3/5a-a	Prime farmland	Not hydric	ATD
104D----- Pence	3e	3/5a-a	Not prime farmland	Not hydric	ATD
104E----- Pence	7e	3/5a-a	Not prime farmland	Not hydric	ATD
109D----- Rousseau----- Dawson-----	4e	5a M/4c-a	Not prime farmland	Not hydric Hydric	AQVac PCS

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
109F-----	7e		Not prime farmland		
Rousseau-----		5a		Not hydric	AQVac
Dawson-----		M/4c-a		Hydric	PCS
110D-----	4w		Not prime farmland		
Au Gres-----		5b		Not hydric	TMC-Vac
Dawson-----		M/4c-a		Hydric	PCS
Rubicon-----		5.3a			AQVac
110E-----	4w		Not prime farmland		
Au Gres-----		5b		Not hydric	TMC-Vac
Dawson-----		M/4c-a		Hydric	PCS
Rubicon-----		5.3a			AQVac
116-----	---		Not prime farmland		
Udipsamments-----		---		Not hydric	---
Udortheents-----		---		Not hydric	---
117D-----	3e	4/1a	Not prime farmland	Not hydric	ATD
Manistee, sandy substratum					
120B-----	3s		Not prime farmland		
McMillan-----		4a		Not hydric	AVO/ATD
Trenary-----		3a		Not hydric	AVO
120D-----	4e		Not prime farmland		
McMillan-----		4a		Not hydric	AVO/ATD
Trenary-----		3a		Not hydric	AVO
120E-----	6e		Not prime farmland		
McMillan-----		4a		Not hydric	AVO/ATD
Trenary-----		3a		Not hydric	AVO
122. Pits, quarry					
126-----	5w	1c	Not prime farmland	Hydric	TTP
Pickford					
129A-----	3w	0b	Not prime farmland	Not hydric	TAM
Rudyard					

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
130A----- Rudyard----- Pickford-----	3w		Not prime farmland		
		0b		Not hydric	TAM
		1c		Hydric	TTP
132B----- Sugar	2e	3/1a	Prime farmland	Not hydric	AVO
133----- Dorval	6w	M/1c	Not prime farmland	Hydric	TTM
143----- Caffey	5w	4/2c	Not prime farmland	Hydric	TTM
146A----- Allendale----- Fibre-----	3w		Not prime farmland		
		4/1b		Not hydric	TMC-D
		4/1c		Hydric	---
167D----- Battydoe----- Wallace-----	4e		Not prime farmland		
		3a		Not hydric	AVO
		5a-h		Not hydric	ATD
173B----- Paquin----- Finch-----	6s		Not prime farmland		
		5a-h		Not hydric	ATD
		5b-h		Not hydric	TMC-Vac
174B----- Crowell----- Spot-----	4s		Not prime farmland		
		5a		Not hydric	AQVac
		5c-h		Hydric	TTS
175D----- Wallace----- Spot-----	6s		Not prime farmland		
		5a-h		Not hydric	ATD
		5c-h		Hydric	TTS
175E----- Wallace----- Spot-----	7s		Not prime farmland		
		5a-h		Not hydric	ATD
		5c-h		Hydric	TTS
176B----- Paquin----- Spot-----	5w		Not prime farmland		
		5a-h		Not hydric	ATD
		5c-h		Hydric	TTS
179B----- Wallace	6s	5a-h	Not prime farmland	Not hydric	ATD

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
179D----- Wallace	6s	5a-h	Not prime farmland	Not hydric	ATD
179E----- Wallace	7s	5a-h	Not prime farmland	Not hydric	ATD
179F----- Wallace	7s	5a-h	Not prime farmland	Not hydric	ATD
180B----- Millecoquins	2e	2.5a	Prime farmland	Not hydric	AVO
186D----- Sporley	3e	3a	Not prime farmland	Not hydric	ATD
186E----- Sporley	6e	3a	Not prime farmland	Not hydric	ATD
186F----- Sporley	7e	3a	Not prime farmland	Not hydric	ATD
187B----- Auger	3e	3a	Not prime farmland	---	TMC-D/ATD
188----- Hendrie	5w	2.5c	Not prime farmland	Hydric	---
189A----- Bodi	3e	3a-a	Not prime farmland	Not hydric	ATD
Chesbrough-----		3b-a		Not hydric	TMC-D
190B----- Bodi	3e	3a-a	Not prime farmland	Not hydric	ATD
191D----- Widgeon	4e	3/2a	Not prime farmland	Not hydric	AVO
Kalkaska-----		5a		Not hydric	ATD
193A----- Annanias	3w	3a-s	Not prime farmland	Not hydric	TMC/TMC-D
194A----- Hendrie	5w	2.5c	Not prime farmland	Hydric	---
Annanias-----		3a-s		Not hydric	TMC
195A----- Chesbrough	4w	3b-a	Not prime farmland	Not hydric	TMC-D
197D----- Zandi	4e	3a	Not prime farmland	Not hydric	ATD
197E----- Zandi	6e	3a	Not prime farmland	Not hydric	ATD
198B----- Vilas	4s	4a	Not prime farmland	Not hydric	AQVac

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
198D----- Vilas	4s	4a	Not prime farmland	Not hydric	AQVac
199B----- Auger-----	3e	3a	Not prime farmland	---	TMC-D
Annantias-----		3a-s		Not hydric	TMC
200B----- Pence	3e	4a-a	Not prime farmland	Not hydric	ATD
200D----- Pence	4e	4a-a	Not prime farmland	Not hydric	ATD
200E----- Pence	7e	4a-a	Not prime farmland	Not hydric	ATD
201B----- Crowell, rarely flooded	4s	5a	Not prime farmland	Not hydric	AQVac
Deford, frequently flooded-----		L-4c		Hydric	FMC
202B----- Whitewash	3s	5.7a	Not prime farmland	Not hydric	AVO
203D----- Frohling	6s	3a-f	Not prime farmland	Not hydric	ATD
203E----- Frohling	7s	3a-f	Not prime farmland	Not hydric	ATD
204----- Gogomain	5w	4/1c	Not prime farmland	Hydric	---
205B----- Kalkaska, burned	4s	5a	Not prime farmland	Not hydric	TM
205D----- Kalkaska, burned	6s	5a	Not prime farmland	Not hydric	TM
206B----- Deerton	4s	4/Ra	Not prime farmland	Not hydric	ATD
211D----- Frohling-----	6s	3a-f	Not prime farmland	Not hydric	ATD
Wallace-----		5a-h		Not hydric	ATD
211E----- Frohling-----	6s	3a-f	Not prime farmland	Not hydric	ATD
Wallace-----		5a-h		Not hydric	ATD
212----- Markey	6w	M/4c	Not prime farmland	Hydric	---

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Michigan soil management group	Prime farmland status	Hydric status	Habitat type (primary/ secondary)
214D-----	4e		Not prime farmland		
Rousseau-----		5a		Not hydric	AQVac
Markey-----		M/4c		Hydric	---
214E-----	6e		Not prime farmland		
Rousseau-----		5a		Not hydric	AQVac
Markey-----		M/4c		Hydric	---
215B-----	6s		Not prime farmland		
Wallace-----		5a-h		Not hydric	ATD
Alcona-----		3a		Not hydric	AVO
215D-----	6s		Not prime farmland		
Wallace-----		5a-h		Not hydric	ATD
Alcona-----		3a		Not hydric	AVO
246B-----	4s	5.3a	Not prime farmland	Not hydric	ATD
Garlic					
246D-----	6s	5.3a	Not prime farmland	Not hydric	ATD
Garlic					
286B-----	2e	3a	Prime farmland	Not hydric	ATD
Fence					
287B-----	3e	5a	Not prime farmland	Not hydric	ATD
Noseum					
300. Beaches					
W. Water					

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