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Natural
Resources
Conservation
Service

In cooperation with United States Department of Agriculture, Forest Service; Michigan Department of Agriculture; Michigan Agricultural Experiment Station; Michigan State University Extension; Michigan Technological University; Soil Classifiers Association of Michigan; and Oscoda County

Soil Survey of Oscoda 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.

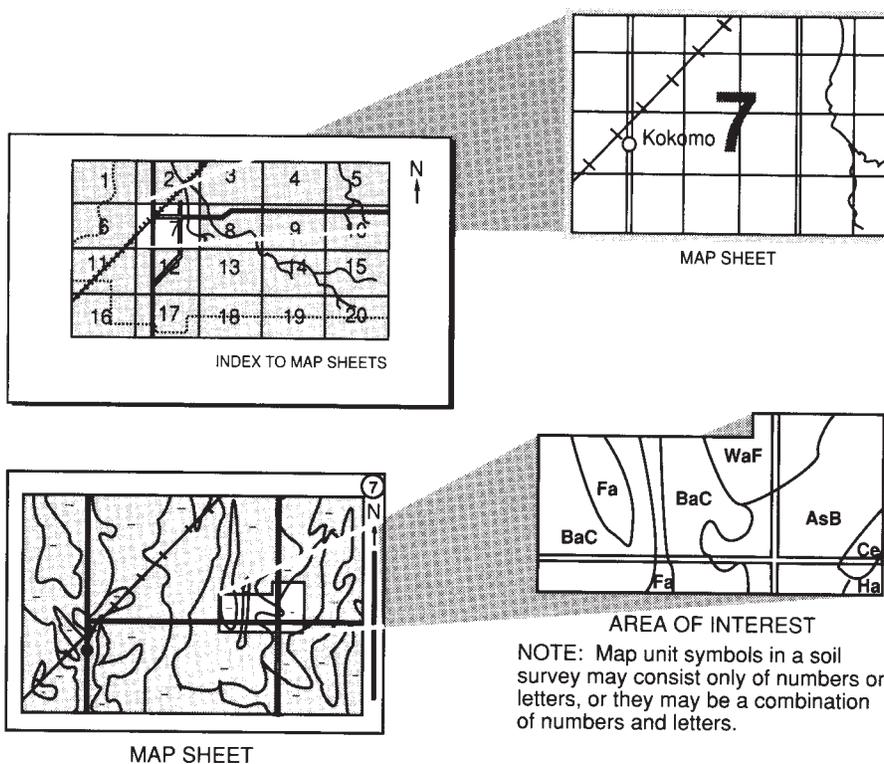
Detailed Soil Maps

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.



National Cooperative Soil Survey

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. This survey was made cooperatively by the Natural Resources Conservation Service; the U.S. Department of Agriculture, Forest Service; the Michigan Department of Agriculture; the Michigan Agricultural Experiment Station; Michigan Technological University; and the Soil Classifiers Association of Michigan. The survey is part of the technical assistance furnished to the Oscoda County Conservation District. The Oscoda County Board of Commissioners provided financial assistance for the survey.

Major fieldwork for this soil survey was completed in 2001. Soil names and descriptions were approved in 2002. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2002. The most current official data are available on the Internet.

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 Photo Caption

The Au Sable River flows eastward through the center of Oscoda County. It is a popular location for trout fishing and canoeing.

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 Oscoda County, Michigan

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United States Department of Agriculture, Natural Resources Conservation Service and Forest Service, in cooperation with the Michigan Agricultural Experiment Station, Michigan State University Extension, Michigan Department of Agriculture, Michigan Technological University, and the Soil Classifiers Association of Michigan

OSCODA COUNTY is in the north-central part of the Lower Peninsula of Michigan (fig. 1). The county is bordered on the north by Montmorency County, on the east by Crawford County, on the south by Ogemaw County, and on the west by Alcona County. It has a total area of 365,831 acres, or about 571 square miles. The population was 9,588 in 2000. Mio, the county seat, is approximately 140 miles north of Lansing.

About 87 percent of the county is forested, and about 3 percent is used as cropland or pasture. About 1 percent is water, and the remaining 9 percent is urban land or other land (Michigan Department of Agriculture, 1997). Forestry, recreation, and tourism are the main economic enterprises in the county.

The first soil survey of Oscoda County was published in 1931 (Veatch and others, 1931). This survey updates the 1931 survey, provides a detailed soil survey on aerial photography, and contains more interpretive information.

General Nature of the County

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

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mio in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 20.7 degrees F and the average daily minimum temperature is 11.3 degrees. The lowest temperature on record, which occurred at Mio on February 17, 1979, was -38 degrees. In summer, the average temperature is 66.0 degrees and the average daily maximum temperature is 79.0 degrees. The highest temperature, which occurred on June 20, 1995, was 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



Figure 1.—Location of Oscoda County in Michigan.

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 26.71 inches. Of this total, about 11.95 inches, or 45 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 3.13 inches at Mio on August 19, 1990. Thunderstorms occur on about 31 days each year, and most occur between May and September.

The average seasonal snowfall is 45.3 inches. The greatest snow depth at any one time during the period of record was 38 inches recorded on February 20, 1979. On an average, 106 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 17.0 inches recorded on January 26, 1978.

The average relative humidity in midafternoon is about 77 percent in December and 48 percent in May. Humidity is higher at night, and the average at dawn is between 85 and 90 percent year round. The sun shines about 63 percent of the time possible in summer and 38 percent in winter. The prevailing wind is from the southwest, except in March and April, when it is from the northwest. Average windspeed is highest, around 10 miles per hour, in January, April, and December.

History and Development

The original Native American inhabitants of the county were scattered bands of Chippewa and Ottawa Indians. The mature pine forest that originally covered most of the area did not provide much food or game. For this reason, most of the Indians passed through the area in search of more productive areas for food and game along

the shores of Lake Huron and Lake Michigan. The Au Sable River served as part of an early transportation route between the two Great Lakes (Sells and Olson).

In 1819, the Indians ceded the area that includes Oscoda County to the United States in the Treaty of Saginaw. Originally part of Alpena County, the survey area became part of Alcona County when the area was split off in 1869. Oscoda County was established in its present form in 1881 (fig. 2). Later that year, Mio was named the county seat (Au Sable River Valley Historical Society, 1979).

In about 1870, lumbermen began arriving and cutting the vast white pine forests. This process continued until about 1890. In about 1887, the settlement of Potts was established in eastern Oscoda County. It was renamed McKinley in 1893 and began to grow with the increased lumbering activity; however, a disastrous fire in 1899 and the depletion of nearby timber caused McKinley to decline in importance. The town survived the lumbering era, and in later decades its proximity to the Au Sable River and the surrounding Huron National Forest have made it a popular base for recreational pursuits. As the virgin pine diminished, logging of hardwoods and less desirable conifers began. This logging continued until about 1920. From the 1920s to the present, lumbering has consisted of cutting the second-growth forests for pulpwood, sawtimber, and pallets.

The lumber industry also brought the railroad into the area. Rail transportation had become well established in Oscoda County by the 1890s. With the extension of the railroad to Comins, the town became the local railhead for Mio and other parts of the county. With the decline in lumbering in the 1920s and the improvement of Michigan Highway 33, the railroad began to diminish in importance. The rail line to Comins was abandoned in 1928, and subsequently Mio became the largest settlement in the county.

As the timber resources first began to decline in about 1900, the Loud Company published a "Home Seekers Guide." This guide brought Mennonite and Amish people from Pennsylvania and Nebraska to the Fairview area. Their arrival at the turn of the century allowed the lumber companies to sell off their land after logging. Because of the success of some of these early Mennonite settlers, the Fairview area has the largest concentration of Mennonites in Michigan.

With the end of the logging era in the 1920s, farming became the chief industry of the county. Much of the newly cleared land, however, consisted of drought-prone sandy soils with little organic matter or nutrients. The farms remaining in the following decades were those that had been established in areas of better soils and where the better farming practices of the period were applied.

With the regrowth of the forests, the forest products industry remains one of the mainstays of the economy. Farming is a smaller but significant part of the local economy, mainly centered on dairy and beef production. In more recent times, recreation and tourism are among the county's main industries. Year-round activities and facilities are available for these uses. The vast amount of publicly and privately owned forestland makes the county very attractive for outdoor recreational pursuits. The Au Sable River is the centerpiece of the tourism industry and offers excellent trout fishing and canoeing. The area lakes provide additional fishing opportunities. There are numerous golf courses in the survey area. Guided tours are available for bird watchers and nature enthusiasts to observe the rare Kirtland's warbler, a small songbird that lives in the county's jack pine habitat. The county has a network of off-road vehicle trails. Horseback riding also is popular. Oscoda County is on the Michigan Shore to Shore Riding and Hiking Trail, which provides a trail for horse riding and hiking that crosses the entire northern peninsula of Michigan. Hunting of deer, bear, turkey, grouse, rabbits, and squirrels is popular in the county. Popular winter sports include ice fishing, cross-country skiing, and snowmobiling. There are several well marked trails for skiers and snowmobilers. Resort, motel, and restaurant facilities are available throughout the county.



Figure 2.—The Oscoda County Courthouse was erected in 1888 and is the oldest wooden courthouse remaining in the northern Lower Peninsula of Michigan.

Streams and Lakes

Oscoda County is drained by two major rivers—the Au Sable River and the Thunder Bay River. A portion of the Thunder Bay River watershed drains the northeastern part of the county. The Upper South Branch of the Thunder Bay River, which is a tributary of the Thunder Bay River and a subdivision of the watershed, flows northward out of the county and eventually joins the mainstream of the Thunder Bay River, which flows eastward before eventually draining into Lake Huron.

The Au Sable River drains the largest portion of Oscoda County. This drainage system can be divided into three minor watersheds—the mainstream, the East Branch

of Big Creek, and the West Branch of Big Creek. The mainstream of the Au Sable River flows to the east where it eventually drains into Lake Huron. The East Branch of Big Creek flows southwesterly into the Au Sable. This section drains the northwestern part of the county. The West Branch of Big Creek flows in a northerly direction through the town of Luzerne and into the Au Sable. This section drains the southwestern part of the county. The Au Sable River flows through the town of Mio, where it meets the first dam on the Au Sable River system, forming Mio Pond. Where the mainstream continues through Mio toward the town of McKinley, the Au Sable has been designated as a National Scenic River. This segment begins 1 mile below Mio Pond and ends just below Forest Road 4001. The purpose of the National Scenic River System is to preserve "certain selected rivers which, with their immediate environment, possess outstanding remarkable geologic, fish and wildlife, historic, cultural or other similar values... in a free flowing condition... for the benefit and enjoyment of present and future generations" (90th Congress, 1968).

There are approximately 105 lakes and impoundments in Oscoda County. The majority are in the northern half and in the south-central part of the county. The largest include McCollum Lake, Shamrock Lake, and Perry Lake in the northeastern part of the county; Snyder Lake, Tee Lake, and Muskrat Lake in the northwest; and Mio Pond, Mack Lake, and Loon Lake in the central and south-central parts of the county.

The many miles of streams and the abundance of lakes in the county provide excellent habitat for a wide variety of fish species. The Au Sable River is known nationwide for its excellent trout fishing and contains good numbers of brook trout, brown trout, and rainbow trout in a carefully managed fishery. Good fishing is also available in its numerous tributary streams and on the Upper South Branch of the Thunder Bay River. Area lakes offer good habitat for common game fish, such as northern pike, walleye, largemouth bass, and smallmouth bass, and for common panfish, such as crappies, perch, and bluegill. Numerous public access sites are available on the Au Sable River and area lakes for boaters and fishermen.

Physiography

Three main bedrock formations underlie Oscoda County. The northern part of the county is underlain by the Coldwater Shale formation. The southern part of the county is underlain by bedrock of the Marshall and Michigan Formations. These formations are of late Mississippian age.

The landforms in Oscoda County are a result of late Wisconsinan glaciation. The retreat of glacial ice in this area occurred between 12,500 and 14,500 years ago. The dominant landforms are outwash plains, ground moraines, lake plains, kame moraines, glacial drainage channels, and disintegration moraines. All of these features formed as a result of the complex action of glaciers and postglacial lakes (Burgis and Eschman, 1981).

The morainic areas are characterized by rolling to steep, uneven, knoblike hills and pothole depressions. Morainic areas occur in the north-central, northeast, south-central, and southeast parts of the county. Within these moraines are both small and large outwash channels characterized by sandy or gravelly soils.

The outwash plains are characterized by nearly level to gently sloping areas. Some areas of outwash are pitted. Major areas of outwash plains are in the eastern and southeastern parts of the county.

The lake plains are characterized by nearly level to undulating areas separated by steep scarps, reflecting changes in glacial lake elevations. The largest lake plain is in southern Elmer Township and western Comins Township.

A series of kame moraines occurs in the far western part of Oscoda County. These kame moraines have a general east-west orientation and stand out as elevated landforms interrupting the gently sloping outwash plains.

A major glacial drainage channel runs east-west along the course of the Au Sable River in the central part of the county. Another glacial drainage channel occurs in the northeastern part of the county between two moraines. These channels are characterized by elongated, nearly level to steep areas dominated by sandy and gravelly soils.

The northern tip of a disintegration moraine occurs in the south-central part of Oscoda County. This landform is characterized by chaotic mounds and pits that are generally randomly oriented. Slopes are nearly level to steep, and the soils are sandy and loamy.

The highest elevation in the county, 1,462 feet above mean sea level, is Mount Tom in the north-central part of the county. The lowest elevation, 873 feet above mean sea level, is along the Au Sable River near the Alcona County line.

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.

Survey Procedures

The general procedures following in making this survey are described in the National Soil Survey Handbook of the Natural Resources Conservation Service (USDA/NRCS, NSSH). The Huron-Manistee National Forest Ecological Classification System (Driscoll and others, 1984) was used in conjunction with the handbook to prepare the soil survey on the Forest Service lands within the administrative boundary of the Huron-Manistee National Forest. The map units on the Forest Service lands were designed differently from those in other parts of the survey area.

The ecological classification system is an integrated system that includes evaluation and classification of landscape areas. Ecological units are mapped on aerial photographs, and interpretations are made from inventory maps for use in managing forestland and resources. In this survey, map symbols 200 to 282 identify map units within the Huron-Manistee National Forest.

Procedures for Map Units 13 to 144 and Map Units 307 to 513

The soil survey maps made for conservation planning prior to the start of the project were among the references used. Before the actual fieldwork began, preliminary boundaries of slopes and landforms were plotted stereoscopically on 1:12,000 leaf-off aerial photographs. USGS topographic maps at a scale of 1:24,000 were used to help the soil scientists relate land and image features.

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 ridgtop 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, 1996). 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 (<http://www.mi.nrcs.usda.gov>).

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.

Procedures for Map Units 200 to 282

Before ecological units were mapped, information on the climate, geology, soils, hydrology, and vegetation in the survey area was collected. Research techniques were used in mid and late successional stands to collect information on vegetative and soil components in areas of uplands. Samples were not collected on early successional aspen stands, young stands, plantations, or stands disturbed by recent harvest or fires. The results were used in developing ecological map units that are defined on the basis of both abiotic and biotic landscape characteristics. Abiotic landscape characteristics are generally stable over time. They include climate and landforms. Biotic characteristics, such as vegetation, are generally unstable over time.

A pre-mapping reconnaissance was conducted in the survey area before actual field inventory began. Important results of the reconnaissance activities include a listing of the expected ecological units that would be mapped in the area, the definition of features differentiating the units, and a set of specific sites in the Huron-Manistee National Forest where detailed data had been collected and analyzed in the laboratory for quality control.

Following reconnaissance, the mapping personnel traversed the landscape, evaluated the components of the current ecosystems, determined and observed ecological unit boundaries in the field, and delineated preliminary map units on aerial photographs. During field mapping, stereo images, photo-tones, and photo colors were used to delineate landscape features on the aerial photographs. Some important characteristics used by the field personnel to evaluate the context of an area included water table levels, soil texture and color, drainage systems, geologic indicators, and interpretation of vegetative species groups.

Mappers typically inventoried 300 to 500 acres per day. They performed detailed evaluations and completed note cards on 10 to 15 specific sites. These sites were strategically selected for the examination of landscape features and the collection of data on overstory, understory, ground flora, forest floor, soil, substratum, and ground water for documenting ecological units. Profiles of sandy soils were described to a depth of 15 feet. The presence of textural bands has been shown to have a significant influence on tree growth and species composition (Hannah and Zahner, 1970; Host and others, 1988). Thus, recording the presence, absence, or intensity of deep-lying textural bands was an important part of the sampling and inventory scheme. These data are a permanent part of the forest records available at the Huron-Manistee National Forest supervisor's office.

Following field inventory, the final boundaries of the ecological units were drawn on the aerial photography. The completed photography was checked for line closure and for matching of delineations across photographs.

General Soil Map Units

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

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

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

Level and Nearly Level, Very Poorly Drained Soils

1. Tawas-Lupton-Leafriver

Setting

Landform: Outwash plains, glacial drainage channels, lake plains, moraines

Slope range: 0 to 2 percent

Composition

Extent of the map unit in the survey area: Less than 1 percent

Extent of the soils in the map unit:

Tawas soils—40 percent

Lupton soils—35 percent

Leafriver soils—15 percent

Soils of minor extent—10 percent

Soil Properties and Qualities

Tawas

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways, low flats

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Lupton

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways, low flats

Parent material: Organic deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Leafriver

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Soils of Minor Extent

- The poorly drained Deford and Kinross soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell and somewhat poorly drained Au Gres soils on low knolls
- The excessively drained Rubicon and Grayling soils on knolls

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality, windthrow hazard

2. Histosols-Aquents-Haplosaprists**Setting**

Landform: Outwash plains, glacial drainage channels, lake plains, moraines

Slope range: 0 to 2 percent

Composition

Extent of the map unit in the survey area: Less than 1 percent

Extent of the soils in the map unit:

Histosols—30 percent

Aquents—30 percent

Haplosaprists—30 percent

Soils of minor extent—10 percent

Soil Properties and Qualities**Histosols**

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways, low flats

Parent material: Organic deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Aquents

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways, low flats

Parent material: Sandy or loamy deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Haplosaprists

Drainage class: Very poorly drained

Position on the landform: Depressions, drainageways, low flats

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Level and nearly level

Soils of Minor Extent

- The poorly drained Deford and Kinross soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell and somewhat poorly drained Au Gres soils in the slightly higher landscape positions
- The excessively drained Rubicon and Grayling soils on knolls and ridges

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality, windthrow hazard

Nearly Level to Undulating, Moderately Well Drained to Very Poorly Drained Soils

3. Croswell-Au Gres-Tawas

Setting

Landform: Outwash plains, glacial drainage channels, moraines

Slope range: 0 to 6 percent

Composition

Extent of the map unit in the survey area: 7 percent

Extent of the soils in the map unit:

Croswell soils—35 percent

Au Gres soils—35 percent

Tawas soils—15 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Croswell

Drainage class: Moderately well drained

Position on the landform: Flats, knolls

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to undulating

Au Gres

Drainage class: Somewhat poorly drained

Position on the landform: Low flats, low knolls, swales

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to undulating

Tawas

Drainage class: Very poorly drained

Position on the landform: Swales, depressions, drainageways

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Nearly level

Soils of Minor Extent

- The excessively drained Rubicon and Grayling soils on knolls

- The poorly drained Deford and Kinross and very poorly drained Lupton and Leafriver soils in positions on the landscape similar to those of the Tawas soils

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality, windthrow hazard

4. Wakeley-Tawas-Kellogg

Setting

Landform: Outwash plains, glacial drainage channels

Slope range: 0 to 6 percent

Composition

Extent of the map unit in the survey area: Less than 1 percent

Extent of the soils in the map unit:

Wakeley soils—35 percent

Tawas soils—25 percent

Kellogg soils—15 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Wakeley

Drainage class: Poorly drained

Position on the landform: Low flats, swales, depressions

Parent material: Sandy over clayey sediments

Texture of the surface layer: Muck

Slope: Nearly level

Tawas

Drainage class: Very poorly drained

Position on the landform: Low flats, depressions, drainageways

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Nearly level

Kellogg

Drainage class: Moderately well drained

Position on the landform: Flats, knolls

Parent material: Sandy over clayey sediments

Texture of the surface layer: Sand

Slope: Nearly level to undulating

Soils of Minor Extent

- The excessively drained Grayling and Rubicon and somewhat excessively drained Graycalm soils in the higher landscape positions
- The moderately well drained Croswell soils in positions on the landscape similar to those of the Kellogg soils
- The somewhat poorly drained Allendale soils on low knolls
- The very poorly drained Lupton soils in positions on the landscape similar to those of the Tawas soils

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality, windthrow hazard

5. Algonquin-Springport-Wakeley

Setting

Landform: Lake plains (fig. 3)

Slope range: 0 to 3 percent

Composition

Extent of the map unit in the survey area: 6 percent

Extent of the soils in the map unit:

Algonquin soils—35 percent

Springport soils—25 percent

Wakeley soils—20 percent

Soils of minor extent—20 percent

Soil Properties and Qualities

Algonquin

Drainage class: Somewhat poorly drained

Position on the landform: Flats, low knolls

Parent material: Loamy and clayey sediments



Figure 3.—A typical area of the Algonquin-Springport-Wakeley general soil map unit on a lake plain. Algonquin soils are in the foreground and background, and Springport soils are in the lower central area. Farming is the dominant land use in areas of these soils.

Texture of the surface layer: Silt loam

Slope: Nearly level to undulating

Springport

Drainage class: Poorly drained

Position on the landform: Low flats, swales

Parent material: Loamy and clayey sediments

Texture of the surface layer: Silt loam

Slope: Nearly level

Wakeley

Drainage class: Poorly drained

Position on the landform: Low flats, swales

Parent material: Sandy over clayey sediments

Texture of the surface layer: Muck

Slope: Nearly level

Soils of Minor Extent

- The moderately well drained Kellogg, Croswell, and Negwegon soils in the higher landscape positions
- The well drained Mongo soils on knolls and ridges
- The somewhat poorly drained Allendale soils on low knolls

Use and Management

Major uses: Cropland and pasture

Management concerns: Seasonal wetness, restricted permeability, tith in the surface layer, compaction, ponding, erosion

6. Croswell-Au Gres-Haplosaprists

Setting

Landform: Outwash plains, glacial drainage channels, moraines

Slope range: 0 to 6 percent

Composition

Extent of the map unit in the survey area: 1 percent

Extent of the soils in the map unit:

Croswell soils—37 percent

Au Gres soils—33 percent

Haplosaprists—15 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Croswell

Drainage class: Moderately well drained

Position on the landform: Flats, knolls

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to undulating

Au Gres

Drainage class: Somewhat poorly drained

Position on the landform: Low flats, low knolls, swales

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to undulating

Haplosaprists

Drainage class: Very poorly drained

Position on the landform: Swales, depressions, drainageways

Parent material: Organic materials over sandy deposits

Texture of the surface layer: Muck

Slope: Nearly level

Soils of Minor Extent

- The excessively drained Rubicon and Grayling soils on knolls and ridges
- The poorly drained Deford and Kinross and very poorly drained Lupton and Leafriver soils in positions on the landscape similar to those of the Haplosaprists

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality, windthrow hazard

Nearly Level to Steep, Excessively Drained to Moderately Well Drained Soils

7. Graycalm-Grayling

Setting

Landform: Outwash plains, glacial drainage channels, moraines

Slope range: 0 to 45 percent

Composition

Extent of the map unit in the survey area: 20 percent

Extent of the soils in the map unit:

Graycalm soils—45 percent

Grayling soils—40 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Graycalm

Drainage class: Somewhat excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Grayling

Drainage class: Excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Soils of Minor Extent

- The somewhat excessively drained Gerrish and Horsehead soils in positions on the landscape similar to those of the major soils

- The moderately well drained Crowell soils in the slightly lower landscape positions
- The very poorly drained Tawas and Lupton soils in depressions and drainageways

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

8. Millersburg-Klacking-Horsehead

Setting

Landform: Moraines

Slope range: 0 to 35 percent

Composition

Extent of the map unit in the survey area: 7 percent

Extent of the soils in the map unit:

Millersburg soils—30 percent

Klacking soils—25 percent

Horsehead soils—20 percent

Soils of minor extent—25 percent

Soil Properties and Qualities

Millersburg

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Loamy sand

Slope: Nearly level to steep

Klacking

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Horsehead

Drainage class: Somewhat excessively drained

Position on the landform: Flats, knolls

Parent material: Sandy and gravelly deposits

Texture of the surface layer: Sand

Slope: Nearly level to steep

Soils of Minor Extent

- The somewhat excessively drained Graycalm soils in positions on the landscape similar to those of the major soils
- The very poorly drained Tawas and Lupton soils in depressions and drainageways
- The well drained Bamfield and moderately well drained Ossineke soils in the slightly lower landscape positions

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

9. Graycalm-Klacking-Perecheney

Setting

Landform: Moraines, outwash plains

Slope range: 0 to 35 percent

Composition

Extent of the map unit in the survey area: 16 percent

Extent of the soils in the map unit:

Graycalm soils—40 percent

Klacking soils—30 percent

Perecheney soils—15 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Graycalm

Drainage class: Somewhat excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Klacking

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Perecheney

Drainage class: Moderately well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sand

Slope: Nearly level to gently rolling

Soils of Minor Extent

- The excessively drained Grayling and somewhat excessively drained Horsehead soils in positions on the landscape similar to those of the Graycalm soils
- The well drained Blue Lake and somewhat excessively drained Islandlake soils in positions on the landscape similar to those of the Klacking soils
- The very poorly drained Tawas and Lupton soils in depressions and drainageways

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

10. Morganlake-Ossineke-Horsehead

Setting

Landform: Moraines

Slope range: 0 to 35 percent

Composition

Extent of the map unit in the survey area: 1 percent

Extent of the soils in the map unit:

Morganlake soils—30 percent

Ossineke soils—25 percent

Horsehead and similar soils—15 percent

Soils of minor extent—30 percent

Soil Properties and Qualities

Morganlake

Drainage class: Moderately well drained

Position on the landform: Flats, knolls, low ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Loamy sand

Slope: Nearly level to gently rolling

Ossineke

Drainage class: Moderately well drained

Position on the landform: Flats, knolls, low ridges

Parent material: Loamy sediments

Texture of the surface layer: Fine sandy loam

Slope: Nearly level to gently rolling

Horsehead

Drainage class: Somewhat excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and gravelly deposits

Texture of the surface layer: Sand

Slope: Nearly level to steep

Soils of Minor Extent

- The well drained Bamfield, Menominee, Klacking, and Blue Lake soils in the higher landscape positions
- The very poorly drained Tawas, poorly drained Wakeley, and somewhat poorly drained Allendale soils in the lower landscape positions

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

11. Grayling-Graycalm-Typic Udipsamments

Setting

Landform: Outwah plains, glacial drainage channels, moraines

Slope range: 0 to 45 percent

Composition

Extent of the map unit in the survey area: 34 percent

Extent of the soils in the map unit:

Grayling soils—45 percent

Graycalm soils—20 percent

Typic Udipsamments—20 percent

Soils of minor extent—15 percent

Soil Properties and Qualities

Grayling

Drainage class: Excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Graycalm

Drainage class: Somewhat excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Typic Udipsamments

Drainage class: Excessively drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Soils of Minor Extent

- The somewhat excessively drained Gerrish and Horsehead soils in positions on the landscape similar to those of the major soils
- The moderately well drained Croswell soils in the slightly lower landscape positions

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

12. Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy-Entic Haplorthods, sandy, loamy substratum

Setting

Landform: Moraines, outwash plains

Slope range: 0 to 35 percent

Composition

Extent of the map unit in the survey area: 4 percent

Extent of the soils in the map unit:

Alfic Haplorthods, sandy over loamy—40 percent

Alfic Haplorthods, sandy—35 percent

Entic Haplorthods, sandy, loamy substratum—15 percent

Soils of minor extent—10 percent

Soil Properties and Qualities

Alfic Haplorthods, sandy over loamy

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Alfic Haplorthods, sandy

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Loamy sand

Slope: Nearly level to steep

Entic Haplorthods, sandy, loamy substratum

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sandy

Slope: Nearly level to rolling

Soils of Minor Extent

- The well drained Glossudalfs and somewhat excessively drained Gerrish and Horsehead soils in positions on the landscape similar to those of the Alfic Haplorthods
- The very poorly drained Histosols and Haplosaprists in depressions and drainageways

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

13. Glennie-Ossineke-Alfic Haplorthods, sandy over loamy

Setting

Landform: Moraines

Slope range: 0 to 35 percent

Composition

Extent of the map unit in the survey area: 2 percent

Extent of the soils in the map unit:

Glennie—35 percent

Ossineke—25 percent

Alfic Haplorthods, sandy over loamy—20 percent

Soils of minor extent—20 percent

Soil Properties and Qualities

Glennie

Drainage class: Moderately well drained

Position on the landform: Flats, knolls, low ridges

Parent material: Loamy sediments

Texture of the surface layer: Loamy sand

Slope: Nearly level to steep

Ossineke

Drainage class: Moderately well drained

Position on the landform: Flats, knolls, low ridges

Parent material: Loamy sediments

Texture of the surface layer: Fine sandy loam

Slope: Nearly level to rolling

Alfic Haplorthods, sandy over loamy

Drainage class: Well drained

Position on the landform: Flats, knolls, ridges

Parent material: Sandy and loamy sediments

Texture of the surface layer: Sand

Slope: Nearly level to steep

Soils of Minor Extent

- The well drained Bamfield soils and the excessively drained Entic Haplorthods, sandy, loamy substratum, in positions on the landscape similar to those of the Glennie soils and the Alfic Haplorthods
- The very poorly drained Tawas, poorly drained Wakeley, and somewhat poorly drained Allendale soils in the lower landscape positions

Use and Management

Major use: Woodland

Management concerns: Equipment limitations, seedling mortality

Detailed Soil Map Units

The map units delineated on the detailed soil maps for this survey area represent the soils or miscellaneous areas in the survey area. These soils or miscellaneous areas are listed as individual components in the map unit descriptions. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is provided in the tables described under the headings “Use and Management of the Soils” and “Soil Properties.”

A map unit delineation on the soil maps represents an area on the landscape. It is identified by differences in the properties and taxonomic classification of components and by the percentage of each component in the map unit.

Components that are dissimilar, or contrasting, are identified in the map unit descriptions. Dissimilar components are those that have properties and behavioral characteristics divergent enough from those of the major components to affect use or to require different management. 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.

Components that are similar to the major components (noncontrasting) are not identified in the map unit descriptions. Similar components are those that have properties and behavioral characteristics similar enough to those of the major components that they do not affect use or require different management.

The presence of multiple 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 segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol is used for each map unit on the soil maps. This symbol precedes the map unit name in the map unit descriptions. Each description includes general information 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 or of the underlying layers, 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 or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. The name of a soil phase commonly indicates a feature that affects use or management. For example, Grayling sand, nearly level and undulating, is a phase of the Grayling series.

A map unit is named for the component or components that make up a dominant percentage of the map unit. Many map units consist of one dominant component. Map unit 75B, Rubicon sand, 0 to 6 percent slopes, is an example.

Some map units are made up of two or more dominant components. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more components in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. Attempting to delineate the individual components of a complex would result in excessive clutter that could make the map illegible. The pattern and proportion of the components in a complex are somewhat similar in all areas. Map unit 13, Tawas-Lupton mucks, is an example.

An *undifferentiated group* is made up of two or more components 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 components in a mapped area are not uniform. An area can be made up of only one of the dominant components, or it can be made up of all of them. Map unit 86, 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. Map unit 78, Pits, borrow, is an example.

Michigan soil management groups are given in the descriptions. These groups are based on the dominant texture, the drainage class, and the major management concerns (Mokma, 1982). Additional information is available from the Michigan State University Extension.

Table 4 provides a complete listing of the detailed soil map units in Oscoda County. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

13—Tawas-Lupton mucks

Setting

Landform: Depressions on outwash plains, moraines, and lake plains (fig. 4)

Map Unit Composition

Tawas and similar soils: 50 to 70 percent

Lupton and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deford and very poorly drained Leafriver soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Au Gres and moderately well drained Crowell soils in the slightly higher landscape positions

Typical Profile

Tawas

Oa1—0 to 7 inches; black muck

Oa2—7 to 15 inches; black muck

Oa3—15 to 24 inches; black muck

Cg1—24 to 30 inches; dark gray mucky sand



Figure 4.—A typical area of Tawas-Lupton mucks. These soils are used mainly as woodland and provide important habitat for wildlife.

Cg2—30 to 55 inches; dark grayish brown sand

Cg3—55 to 80 inches; grayish brown gravelly sand

Lupton

Oa1—0 to 4 inches; black muck

Oa2—4 to 55 inches; black muck

Oa3—55 to 80 inches; dark brown muck

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: High or very high

Shrink-swell potential: Tawas—low in the sandy material; Lupton—not rated

Permeability: Tawas—moderately slow to moderately rapid in the organic material and rapid in the sandy material; Lupton—moderately slow to moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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: Tawas—M/4c; Lupton—Mc

14—Dawson-Loxley peats

Setting

Landform: Depressions on outwash plains

Map Unit Composition

Dawson and similar soils: 50 to 70 percent

Loxley and similar soils: 30 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- Small areas of water
- The poorly drained Kinross and Deford soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Au Gres soils in the slightly higher landscape positions

Typical Profile

Dawson

Oi—0 to 4 inches; reddish brown peat

Oe—4 to 9 inches; very dark brown and black mucky peat

Oa—9 to 32 inches; very dark brown, very dark gray, and black muck

C—32 to 80 inches; dark brown and brown, mottled sand

Loxley

- Oi—0 to 6 inches; very dark brown peat
- Oa1—6 to 43 inches; dark brown and very dark brown muck
- Oa2—43 to 80 inches; black and very dark brown muck

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: Very high

Shrink-swell potential: Dawson—low in the sandy material; Loxley—not rated

Permeability: Dawson—moderately slow to moderately rapid in the organic material and rapid in the sandy material; Loxley—moderately slow to moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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: 7w

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

15A—Crowell-Au Gres sands, 0 to 3 percent slopes

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Crowell and similar soils: 50 to 70 percent

Au Gres and similar soils: 25 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deford soils in the lower landscape positions
- The excessively drained Grayling soils in the slightly higher landscape positions

Typical Profile

Crowell

A—0 to 2 inches; black sand

E—2 to 8 inches; brown sand

Bs1—8 to 12 inches; dark brown sand

Bs2—12 to 19 inches; strong brown sand

BC—19 to 33 inches; light yellowish brown, mottled sand

C—33 to 80 inches; brown and light brownish gray, mottled sand

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

Surface runoff class: Negligible

Potential for frost action: Crowell—low; Au Gres—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Crowell—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: Crowell—2.0 feet (April and May); Au Gres—0.5 foot (April and 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 in areas of the Crowell soil should be stabilized.

- In the wetter areas of the Au Gres soil, 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 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 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: 4s

Michigan soil management group: Croswell—5a; Au Gres—5b

16B—Graycalm sand, 0 to 6 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Horsehead, and well drained Klacking soils in landscape positions similar to those of the Graycalm soil
- The moderately well drained Croswell soils in landscape positions similar to or slightly lower than those of the Graycalm soil

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

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, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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

16C—Graycalm sand, 6 to 12 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 6 to 12 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.

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

16D—Graycalm sand, 12 to 18 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 12 to 18 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 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: 6s

Michigan soil management group: 5a

17A—Croswell sand, 0 to 3 percent slopes

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Croswell and similar soils: 100 percent

Typical Profile

Croswell

A—0 to 2 inches; black sand

E—2 to 8 inches; brown sand

Bs1—8 to 12 inches; dark brown sand

Bs2—12 to 19 inches; strong brown sand

BC—19 to 33 inches; light yellowish brown, mottled sand

C—33 to 80 inches; brown and light brownish gray, mottled sand

Soil Properties and Qualities

Slope: 0 to 3 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: 2.0 feet (April and 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.
- 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

17B—Croswell sand, 0 to 6 percent slopes

Setting

Landform: Lake plains, outwash plains, and moraines

Map Unit Composition

Croswell and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deford and very poorly drained Tawas soils in the lower landscape positions
- The somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The excessively drained Rubicon soils in the slightly higher landscape positions
- The moderately well drained Cublake and Chinwhisker soils in landscape positions similar to those of the Croswell soil

Typical Profile

Croswell

A—0 to 2 inches; black sand

E—2 to 8 inches; brown sand

Bs1—8 to 12 inches; dark brown sand

Bs2—12 to 19 inches; strong brown sand

BC—19 to 33 inches; light yellowish brown, mottled sand

C—33 to 80 inches; brown and light brownish gray, mottled sand

Soil Properties and Qualities

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: 2.0 feet (April and May)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—building site development, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

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

18A—Au Gres sand, 0 to 3 percent slopes***Setting***

Landform: Outwash plains, moraines, and stream terraces

Map Unit Composition

Au Gres and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Kinross and Deford soils in the slightly lower landscape positions
- The moderately well drained Croswell soils in the slightly higher landscape positions

Typical Profile**Au Gres**

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

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: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 0.5 foot (April and May)

Ponding: None

Use and Management

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

Woodland

- 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 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.
- 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

19—Leafriver muck***Setting***

Landform: Moraines and outwash plains

Map Unit Composition

Leafriver and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Lupton and poorly drained Deford soils in landscape positions similar to those of the Leafriver soil
- The somewhat poorly drained Au Gres soils in the slightly higher landscape positions

Typical Profile**Leafriver**

Oa—0 to 12 inches; black muck

C1—12 to 20 inches; dark yellowish brown sand

C2—20 to 40 inches; yellowish brown sand

C3—40 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 0 to 1 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: Moderate or moderately rapid in the organic material and rapid in the sandy material

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on this soil.

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, 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

20B—Graycalm-Grayling sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 50 to 75 percent

Grayling and similar soils: 25 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon, somewhat excessively drained Horsehead, and

well drained Klacking soils in landscape positions similar to those of the major soils

- The moderately well drained Crowell and somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The poorly drained Deford soils in the lower landscape positions

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw1—2 to 7 inches; brown sand

Bw2—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

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: Graycalm—somewhat excessively drained; Grayling—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, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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: 4s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

20D—Graycalm-Grayling sands, 6 to 18 percent slopes***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 50 to 75 percent

Grayling and similar soils: 25 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon, somewhat excessively drained Horsehead, and well drained Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell soils in the slightly lower landscape positions

Typical Profile**Graycalm**

O_e—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw₁—3 to 7 inches; dark yellowish brown sand

Bw₂—7 to 17 inches; dark yellowish brown sand

Bw₃—17 to 24 inches; yellowish brown sand

E and B_t—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- Bw1—2 to 7 inches; brown sand
- Bw2—7 to 15 inches; dark yellowish brown sand
- BC—15 to 23 inches; yellowish brown sand
- C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

- Slope:* 6 to 18 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 uses—building site development, pasture

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 the results of soil tests helps to ensure the maximum growth of plants.

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 6s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

20F—Graycalm-Grayling sands, 18 to 45 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 45 to 60 percent

Grayling and similar soils: 40 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon, somewhat excessively drained Horsehead, and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw1—2 to 7 inches; brown sand

Bw2—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 to 45 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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 cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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.
- 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: 7s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

21D—Graycalm-Klacking complex, 6 to 18 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 60 percent

Klacking and similar soils: 40 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand
 E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Klacking

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 3 inches; very dark grayish brown loamy sand
 Bw1—3 to 13 inches; dark yellowish brown sand
 Bw2—13 to 21 inches; yellowish brown sand
 E and Bt—21 to 39 inches; light yellowish brown sand with bands of brown loamy sand
 B/E—39 to 46 inches; brown sandy loam and yellowish brown sand
 E and B't—46 to 80 inches; light yellowish brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Graycalm—severe; Klacking—moderate

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Graycalm—somewhat excessively drained; Klacking—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Graycalm—rapid; Klacking—rapid or 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 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, these soils are poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 6s

Michigan soil management group: Graycalm—5a; Klacking—4s

23—Ausable-Bowstring mucks, frequently flooded

Setting

Landform: Flood plains (fig. 5)

Map Unit Composition

Ausable and similar soils: 50 to 65 percent

Bowstring and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 10 percent

Minor Components

Contrasting inclusions:

- Small areas of water
- The very poorly drained Tawas and poorly drained Thunderbay soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Au Gres soils in the slightly higher landscape positions

Typical Profile

Ausable

Oa—0 to 11 inches; black muck

C—11 to 16 inches; light olive brown, mottled sand

Cg1—16 to 23 inches; grayish brown, mottled sand with thin layers of black muck

Cg2—23 to 48 inches; dark gray and light brownish gray, mottled sand with thin layers of black muck

Cg3—48 to 80 inches; dark gray and light yellowish brown, mottled sand with thin layers of black muck

Bowstring

Oa1—0 to 13 inches; black muck

Oa2—13 to 32 inches; very dark brown muck

C—32 to 47 inches; light olive brown and light yellowish brown sand stratified with very dark brown muck

O'a—47 to 74 inches; black muck

Cg—74 to 80 inches; dark grayish brown sand

Soil Properties and Qualities

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: Negligible

Potential for frost action: Ausable—moderate; Bowstring—high

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Available water capacity: Ausable—moderate; Bowstring—very high



Figure 5.—An area of Ausable-Bowstring mucks, frequently flooded.

Shrink-swell potential: Low

Permeability: Ausable—moderate or moderately rapid in the organic material and rapid in the sandy material; Bowstring—moderate or moderately rapid

Frequency and most likely period of flooding: Frequent (January, February, March, April, May, November, December)

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of ponding and flooding, these soils are generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: Ausable—L-4c; Bowstring—L-Mc

24A—Kinross-Au Gres complex, 0 to 3 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Kinross and similar soils: 50 to 60 percent

Au Gres and similar soils: 30 to 40 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deford soils in landscape positions similar to those of the Kinross soil
- The moderately well drained Croswell soils in the slightly higher landscape positions

Typical Profile

Kinross

Oa—0 to 3 inches; black muck

E—3 to 10 inches; grayish brown, mottled sand

Bhs—10 to 14 inches; dark reddish brown sand

Bs—14 to 22 inches; yellowish brown, mottled sand

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

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Soil Properties and Qualities

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, May, October, November, December); Au Gres—0.5 foot (April and May)

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

Depth and most likely period of ponding: Kinross—0.5 foot (January, February, March, April, May, October, November, December); Au Gres—not ponded

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

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.
- Buildings can be constructed on the Au Gres soil using 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 ponding.
- On the Au Gres soil, filling or mounding with suitable material helps to raise the absorption field above the water table.

Interpretive Groups

Land capability classification: 6w

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

26B—Cublake sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Cublake and similar soils: 100 percent

Typical Profile

Cublake

- A—0 to 3 inches; black sand
- E—3 to 5 inches; brown sand
- Bs—5 to 10 inches; brown sand
- Bw—10 to 24 inches; dark yellowish brown and brownish yellow sand
- C—24 to 45 inches; pale brown, mottled sand
- 2C—45 to 80 inches; stratified brown, mottled very fine sandy loam and silt loam

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Low

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: 2.0 to 3.5 feet (January, February, March, April, May, September, 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, 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.
- 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: 4s

Michigan soil management group: 5a

27A—Tacoda sand, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Tacoda and similar soils: 100 percent

Typical Profile

Tacoda

- A—0 to 3 inches; black sand
- E—3 to 15 inches; light gray, mottled sand
- Bs—15 to 23 inches; dark brown, mottled sand
- Bw—23 to 35 inches; very pale brown, mottled sand
- BC—35 to 45 inches; brown, mottled sand
- 2C—45 to 80 inches; brown, mottled silty clay

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

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: Low

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: 0.5 foot to 3.5 feet (April and 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 and by using such harvest methods as selective cutting and strip cutting.
- 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: 4w

Michigan soil management group: 4/1b

31B—Klacking loamy sand, 0 to 6 percent slopes

Setting

Landform: Kames, moraines, and outwash plains

Map Unit Composition

Klacking and similar soils: 100 percent

Typical Profile

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; very dark grayish brown loamy sand

Bw1—3 to 13 inches; dark yellowish brown sand

Bw2—13 to 21 inches; yellowish brown sand

E and Bt—21 to 39 inches; light yellowish brown sand with bands of brown loamy sand

B/E—39 to 46 inches; brown sandy loam and yellowish brown sand

E and B't—46 to 80 inches; light yellowish brown sand with bands of brown loamy sand

Soil Properties and Qualities

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: Well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid or 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

- No major management 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

- No major management concerns affect the use of this soil as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: 4a

31C—Klacking loamy sand, 6 to 12 percent slopes***Setting***

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Klacking and similar soils: 100 percent

Typical Profile**Klacking**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; very dark grayish brown loamy sand

Bw1—3 to 13 inches; dark yellowish brown sand

Bw2—13 to 21 inches; yellowish brown sand

E and Bt—21 to 39 inches; light yellowish brown sand with bands of brown loamy sand

B/E—39 to 46 inches; brown sandy loam and yellowish brown sand

E and B't—46 to 80 inches; light yellowish brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 6 to 12 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: Rapid or 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

- No major management 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.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: 4a

31D—Klacking loamy sand, 12 to 18 percent slopes***Setting***

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Klacking and similar soils: 100 percent

Typical Profile**Klacking**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; very dark grayish brown loamy sand

Bw1—3 to 13 inches; dark yellowish brown sand

Bw2—13 to 21 inches; yellowish brown sand

E and Bt—21 to 39 inches; light yellowish brown sand with bands of brown loamy sand

B/E—39 to 46 inches; brown sandy loam and yellowish brown sand

E and B't—46 to 80 inches; light yellowish brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 12 to 18 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: Rapid or 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 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.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: 4a

32B—Kellogg sand, 0 to 6 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Kellogg and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley and Springport soils in the lower landscape positions
- The somewhat poorly drained Allendale soils in the slightly lower landscape positions
- The excessively drained Grayling soils in landscape positions similar to or slightly higher than those of the Kellogg soil

Typical Profile

Kellogg

Ap—0 to 8 inches; very dark grayish brown sand

E—8 to 13 inches; pinkish gray sand

Bs1—13 to 17 inches; brown sand

Bs2—17 to 26 inches; strong brown sand

2B/E—26 to 28 inches; brown, mottled clay loam and sandy loam and brown loamy sand

2Bt—28 to 34 inches; brown, mottled silty clay loam

2BC—34 to 46 inches; brown, mottled, calcareous silty clay loam

2C—46 to 80 inches; brown, mottled, calcareous silty clay loam

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Low to moderate

Shrink-swell potential: High in the lower part

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

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (January, February, March, April, May, October, November, December)

Ponding: None

Use and Management

Land use: Dominant use—woodland (fig. 6); other uses—building site development, cropland, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

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

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.
- Backfilling the trenches with porous material helps to compensate for the restricted permeability.



Figure 6.—A mature stand of northern hardwoods in an area of Kellogg sand, 0 to 6 percent slopes.

- 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: 3s

Michigan soil management group: 4/1a

32C—Kellogg sand, 6 to 12 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Kellogg and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley soils in the lower landscape positions
- The somewhat poorly drained Allendale soils in the slightly lower landscape positions
- The well drained Klacking soils in landscape positions similar to or slightly higher than those of the Kellogg soil

Typical Profile

Kellogg

- Ap—0 to 8 inches; very dark grayish brown sand
- E—8 to 13 inches; pinkish gray sand
- Bs1—13 to 17 inches; brown sand
- Bs2—17 to 26 inches; strong brown sand
- 2B/E—26 to 28 inches; brown, mottled clay loam and sandy loam and brown loamy sand
- 2Bt—28 to 34 inches; brown, mottled silty clay loam
- 2BC—34 to 46 inches; brown, mottled, calcareous silty clay loam
- 2C—46 to 80 inches; brown, mottled, calcareous silty clay loam

Soil Properties and Qualities

- Slope:* 6 to 12 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:* Moderately well drained
- Available water capacity:* Low to moderate
- Shrink-swell potential:* High in the lower part
- Permeability:* Rapid in the upper part and slow or very slow in the lower part
- Flooding:* None
- Depth to seasonal high water table:* 2.0 to 3.0 feet (January, February, March, April, May, October, November, December)
- Ponding:* None

Use and Management

Land use: Dominant use—woodland; other uses—building site development, cropland, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

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

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 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: 3s

Michigan soil management group: 4/1a

36B—Annalake loamy very fine sand, 0 to 6 percent slopes

Setting

Landform: Lake plains, outwash plains, and moraines

Map Unit Composition

Annalake and similar soils: 100 percent

Typical Profile

Annalake

Ap—0 to 9 inches; very dark grayish brown loamy fine sand

E—9 to 11 inches; pinkish gray fine sand

Bs—11 to 16 inches; brown loamy fine sand

E/B—16 to 30 inches; light brown loamy sand and reddish brown sandy loam

Bt—30 to 37 inches; reddish brown, mottled sandy loam

BC—37 to 46 inches; reddish brown, mottled sandy loam

C—46 to 70 inches; light brown, mottled, stratified sandy loam, fine sandy loam, silt loam, and loamy sand

Cg—70 to 80 inches; light brownish gray, mottled, stratified silt, silt loam, sandy loam, sand, and fine sand

Soil Properties and Qualities

Slope: 0 to 6 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate

Flooding: None

Depth to seasonal high water table: 2.5 to 3.5 feet (March, April, May, June, September, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major management 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 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-s

37A—Richter loamy fine sand, 0 to 3 percent slopes

Setting

Landform: Glacial drainage channels; lake plains

Map Unit Composition

Richter and similar soils: 100 percent

Typical Profile

Richter

A—0 to 8 inches; black loamy fine sand

E—8 to 12 inches; light gray loamy sand

Bs—12 to 18 inches; brown, mottled loamy sand

B/E—18 to 26 inches; brown sandy loam and pale brown loamy sand

Bt—26 to 37 inches; stratified brown and reddish brown, mottled fine sandy loam to clay loam

C—37 to 60 inches; stratified pinkish gray and reddish brown, mottled loamy sand to silt loam

Soil Properties and Qualities

Slope: 0 to 3 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: 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 and 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 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: 2w

Michigan soil management group: 3b-s

41C—McGinn loamy sand, 6 to 12 percent slopes

Setting

Landform: Ground moraines

Map Unit Composition

McGinn and similar soils: 100 percent

Typical Profile

McGinn

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; light brownish gray loamy sand
- Bw—4 to 16 inches; strong brown and dark yellowish brown loamy sand
- E'—16 to 18 inches; grayish brown loamy sand
- E/B—18 to 21 inches; grayish brown loamy sand and reddish brown sandy loam
- B/E—21 to 25 inches; reddish brown sandy loam and grayish brown loamy sand
- Bt—25 to 35 inches; reddish brown sandy loam
- C—35 to 80 inches; light reddish brown sandy loam

Soil Properties and Qualities

- Slope:* 6 to 12 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

Woodland

- No major management 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.
- 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: 3e

Michigan soil management group: 3a

44B—Ossineke fine sandy loam, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Ossineke and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The well drained Millersburg soils in landscape positions similar to or slightly higher than those of the Ossineke soil
- The moderately well drained Morganlake soils in landscape positions similar to those of the Ossineke soil
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions

Typical Profile

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Soil Properties and Qualities

Slope: 0 to 6 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 1.5 to 3.0 feet (April and May)

Ponding: None

Use and Management

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

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.
- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.

- 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 the results of 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 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: 3e

Michigan soil management group: 3a

44C—Ossineke fine sandy loam, 6 to 12 percent slopes

Setting

Landform: Ground moraines and disintegration moraines

Map Unit Composition

Ossineke and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The well drained Millersburg soils in landscape positions similar to or slightly higher than those of the Ossineke soil
- The moderately well drained Morganlake soils in landscape positions similar to those of the Ossineke soil
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions

Typical Profile

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 1.5 to 3.0 feet (April and May)

Ponding: None

Use and Management

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

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.
- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.

- 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

47D—Graycalm sand, 6 to 18 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the Graycalm soil
- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the Graycalm soil

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 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 uses—building site development, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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 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: 6s

Michigan soil management group: 5a

47F—Graycalm sand, 18 to 45 percent slopes***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the Graycalm soil

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 18 to 45 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 (fig. 7)

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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.



Figure 7.—An area of Graycalm sand, 18 to 45 percent slopes, in which selective cutting has been used.

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 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.
- 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: 5a

50B—Au Gres-Kinross-Croswell complex, 0 to 6 percent slopes

Setting

Landform: Outwash plains, stream terraces, and moraines

Map Unit Composition

Au Gres and similar soils: 50 percent

Kinross and similar soils: 30 percent

Croswell and similar soils: 20 percent

Typical Profile

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Kinross

Oa—0 to 3 inches; black muck

E—3 to 10 inches; grayish brown, mottled sand

Bhs—10 to 14 inches; dark reddish brown sand

Bs—14 to 22 inches; yellowish brown, mottled sand

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

Croswell

A—0 to 2 inches; black sand

E—2 to 8 inches; brown sand

Bs1—8 to 12 inches; dark brown sand

Bs2—12 to 19 inches; strong brown sand

BC—19 to 33 inches; light yellowish brown, mottled sand

C—33 to 80 inches; brown and light brownish gray, mottled sand

Soil Properties and Qualities

Slope: Au Gres—0 to 3 percent; Kinross—0 to 2 percent; Croswell—0 to 6 percent

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

Surface runoff class: Negligible

Potential for frost action: Au Gres and Kinross—moderate; Croswell—low

Depth to restrictive feature: More than 80 inches

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

Croswell—moderately well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

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

Croswell—2.0 feet (April and May)

Depth and most likely period of ponding: Kinross—0.5 foot (January, February, March, April, May, October, November, December); Au Gres and Croswell—not ponded

Months in which ponding does not occur: Kinross—June, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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.
- Landing sites on the Kinross soil generally can be used only during the driest time of year. Because of wetness and seedling mortality, trees are generally not planted on this soil. Year-round logging roads require roadfill and gravel. Culverts are needed to maintain the natural drainage system.

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.

- The Kinross soil is generally unsuited to building site development because of the ponding.

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.
- The Kinross soil is generally unsuited to use as a site for septic tank absorption fields because of ponding.

Interpretive Groups

Land capability classification: 4w

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

51—Tawas-Leafriver mucks

Setting

Landform: Depressions on moraines, lake plains, and outwash plains

Map Unit Composition

Tawas and similar soils: 50 to 80 percent

Leafriver and similar soils: 20 to 40 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Lupton and poorly drained Deford soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Au Gres soils in the slightly higher landscape positions
- The moderately well drained Croswell soils in the higher landscape positions

Typical Profile

Tawas

Oa1—0 to 7 inches; black muck

Oa2—7 to 15 inches; black muck

Oa3—15 to 24 inches; black muck

Cg1—24 to 30 inches; dark gray mucky sand

Cg2—30 to 55 inches; dark grayish brown sand

Cg3—55 to 80 inches; grayish brown gravelly sand

Leafriver

Oa—0 to 12 inches; black muck

C1—12 to 20 inches; dark yellowish brown sand

C2—20 to 40 inches; yellowish brown sand

C3—40 to 80 inches; light yellowish brown sand

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: Moderate to high

Shrink-swell potential: Low

Permeability: Moderately slow to moderately rapid in the organic material and rapid in the sandy material

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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: Tawas—M/4c; Leafriver—5c

53B—Negwegon silt loam, 2 to 6 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Negwegon and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Islandlake and moderately well drained Parmalee and Kellogg soils in landscape positions similar to those of the Negwegon soil
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions
- The poorly drained Springport soils in the lower landscape positions

Typical Profile

Negwegon

Ap—0 to 10 inches; dark grayish brown silt loam

B/E—10 to 15 inches; brown, mottled silty clay loam and light brown, mottled silt loam

Bt1—15 to 23 inches; reddish brown, mottled silty clay

Bt2—23 to 34 inches; brown, mottled silty clay

C—34 to 80 inches; brown, mottled silty clay loam

Soil Properties and Qualities

Slope: 2 to 6 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: Moderately well drained

Available water capacity: High

Shrink-swell potential: High

Permeability: Slow or very slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, October, November)

Ponding: None

Use and Management

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

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 systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.

- Adding lime and fertilizer according to the results of 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 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: 3e

Michigan soil management group: 1.5a

53C—Negwegon silt loam, 6 to 12 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Negwegon and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Islandlake and moderately well drained Parmalee and Kellogg soils in landscape positions similar to those of the Negwegon soil
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions
- The poorly drained Springport soils in the lower landscape positions

Typical Profile

Negwegon

Ap—0 to 10 inches; dark grayish brown silt loam

B/E—10 to 15 inches; brown, mottled silty clay loam and light brown, mottled silt loam

Bt1—15 to 23 inches; reddish brown, mottled silty clay

Bt2—23 to 34 inches; brown, mottled silty clay

C—34 to 80 inches; brown, mottled silty clay loam

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: High

Shrink-swell potential: High

Permeability: Slow or very slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, October, November)

Ponding: None

Use and Management

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

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 systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- 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: 1.5a

54A—Algonquin silt loam, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Algonquin and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Negwegon and Kellogg soils in the slightly higher landscape positions
- The somewhat poorly drained Au Gres and Bowers soils in landscape positions similar to those of the Algonquin soil
- The poorly drained Springport soils in the slightly lower landscape positions

Typical Profile

Algonquin

Ap—0 to 6 inches; very dark grayish brown silt loam

Bt1—6 to 15 inches; brown, mottled clay

Bt2—15 to 18 inches; brown, mottled, calcareous silty clay loam

BC—18 to 35 inches; brown, mottled, calcareous silty clay loam

C—35 to 80 inches; light yellowish brown, mottled, calcareous silty clay loam

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: High

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: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: 0.5 foot to 1.5 feet (April and May)

Ponding: None

Use and Management

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

Cropland

- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.
- Because of the restricted permeability, subsurface drains should be narrowly spaced.

- Subsurface drains can reduce the wetness if a suitable outlet is available.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of soil tests helps to ensure the maximum growth of plants.

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 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: 1.5b

56B—Nester loam, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Nester and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley soils in the lower landscape positions
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions
- The moderately well drained Morganlake and Ossineke soils in landscape positions similar to those of the Nester soil

Typical Profile

Nester

- A—0 to 3 inches; black loam
- E—3 to 6 inches; light brownish gray loam
- E/B—6 to 16 inches; light brownish gray and reddish brown clay loam
- Bt—16 to 34 inches; reddish brown, mottled clay
- BC—34 to 41 inches; brown, mottled, calcareous clay loam
- C—41 to 80 inches; brown, mottled, calcareous clay loam

Soil Properties and Qualities

Slope: 0 to 6 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, October, November)

Ponding: None

Use and Management

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

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 and additions of organic material increase the content of organic matter and the available water capacity.
- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

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 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: 1.5a

56C—Nester loam, 6 to 12 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Nester and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley soils in the lower landscape positions
- The somewhat poorly drained Algonquin soils in the slightly lower landscape positions
- The moderately well drained Morganlake and Ossineke soils in landscape positions similar to those of the Nester soil

Typical Profile

Nester

A—0 to 3 inches; black loam

E—3 to 6 inches; light brownish gray loam

E/B—6 to 16 inches; light brownish gray and reddish brown clay loam

Bt—16 to 34 inches; reddish brown, mottled clay

BC—34 to 41 inches; brown, mottled, calcareous clay loam

C—41 to 80 inches; brown, mottled, calcareous clay loam

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, October, November)

Ponding: None

Use and Management

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

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 and additions of organic material increase the content of organic matter and the available water capacity.
- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

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 should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- 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: 1.5a

57B—Kawkawlin loam, 1 to 4 percent slopes

Setting

Landform: Till plains

Map Unit Composition

Kawkawlin and similar soils: 100 percent

Typical Profile

Kawkawlin

Ap—0 to 10 inches; very dark grayish brown loam

B/E—10 to 13 inches; brown, mottled clay loam and loam

Bt—13 to 16 inches; strong brown, mottled clay loam

BC—16 to 30 inches; strong brown, mottled, calcareous clay loam

C—30 to 60 inches; reddish brown, mottled, calcareous clay loam

Soil Properties and Qualities

Slope: 1 to 4 percent

Hazard of soil blowing: Slight

Surface runoff class: High

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: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 0.5 foot to 1.5 feet (April and May)

Ponding: None

Use and Management

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

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 systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.
- Most adapted crops can be grown if an adequate drainage system is installed.

- In some areas, improving drainage is difficult because adequate outlets are not available.
- Subsurface drains can reduce the wetness if a suitable outlet is available.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of 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.
- 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 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 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: 1.5b

58A—Wakeley-Allendale complex, 0 to 3 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wakeley and similar soils: 55 to 70 percent

Allendale and similar soils: 25 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Springport and Deford soils in landscape positions similar to those of the Wakeley soil
- The somewhat poorly drained Algonquin soils in landscape positions similar to those of the Allendale soil
- The moderately well drained Morganlake and Kellogg soils in the higher landscape positions

Typical Profile

Wakeley

- Oa—0 to 7 inches; black muck
- C—7 to 22 inches; light olive brown, mottled sand
- 2Cg1—22 to 29 inches; dark gray, mottled, calcareous clay
- 2Cg2—29 to 80 inches; gray, mottled, calcareous silty clay

Allendale

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 5 inches; very dark gray sand
- E—5 to 10 inches; light brownish gray, mottled sand
- Bs1—10 to 17 inches; dark brown, mottled sand
- Bs2—17 to 32 inches; dark yellowish brown, mottled sand
- 2Bt1—32 to 40 inches; reddish brown, mottled, calcareous clay
- 2Bt2—40 to 63 inches; brown, mottled, calcareous silty clay
- 2C—63 to 80 inches; dark grayish brown, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: Wakeley—0 to 2 percent; Allendale—0 to 3 percent

Hazard of soil blowing: Wakeley—moderate; Allendale—severe

Surface runoff class: Very low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Wakeley—poorly drained; Allendale—somewhat poorly drained

Available water capacity: Low in the sandy material and moderate to high in the clayey material

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: Wakeley—at the surface (January, February, March, April, May, June, September, October, November, December); Allendale—0.5 foot to 2.5 feet (April, May, November, December)

Months in which ponding does not occur: Wakeley—June, July, August, September, October

Depth and most likely period of ponding: Wakeley—0.5 foot (January, February, March, April, May, November, December); Allendale—not ponded

Use and Management

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

Pasture

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

Woodland

- 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 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of ponding, the Wakeley soil is generally unsuited to building site development.
- 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.

Septic tank absorption fields

- Because of ponding, the Wakeley soil is generally unsuited to use as a site for septic tank absorption fields.
- 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 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: 5w

Michigan soil management group: Wakeley—4/1c; Allendale—4/1b

67A—Bowers-Deerheart complex, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Bowers and similar soils: 55 to 70 percent

Deerheart and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Morganlake and Parmalee soils in the slightly higher landscape positions
- The somewhat poorly drained losco soils in landscape positions similar to those of the Bowers soil

Typical Profile

Bowers

Ap—0 to 8 inches; very dark grayish brown loam

B/E—8 to 11 inches; mottled, brown silty clay loam and grayish brown sandy loam

Bt—11 to 25 inches; brown, mottled silty clay loam

BC—25 to 45 inches; brown, mottled, calcareous silty clay loam

C—45 to 80 inches; stratified light yellowish brown, mottled, calcareous silty clay loam and silt loam

Deerheart

Ap—0 to 6 inches; very dark grayish brown, mottled silt loam

Bg—6 to 27 inches; gray, mottled silty clay loam

BC—27 to 43 inches; light olive brown, mottled, calcareous silty clay loam

C—43 to 80 inches; mottled, calcareous, stratified brown silty clay loam and light olive brown very fine sandy loam, silt, and silt loam

Soil Properties and Qualities

Slope: Bowers—0 to 3 percent; Deerheart—0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Bowers—somewhat poorly drained; Deerheart—poorly drained

Available water capacity: High

Shrink-swell potential: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: Bowers—0.5 foot (April and May); Deerheart—at the surface (January, February, March, April, May, October, November, December)

Months in which ponding does not occur: Deerheart—May, June, July, August, September

Depth and most likely period of ponding: Deerheart—0.5 foot (January, February, March, April, May, October, November, December); Bowers—not ponded

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- The Deerheart soil is generally unsuited to building site development because of ponding.

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.
- The Deerheart soil is generally unsuited to use as a site for septic tank absorption fields because of ponding.

Interpretive Groups

Land capability classification: 2w

Michigan soil management group: 1.5b

70—Lupton muck

Setting

Landform: Depressions on moraines, lake plains, and outwash plains

Map Unit Composition

Lupton and similar soils: 100 percent

Typical Profile

Lupton

- Oa1—0 to 4 inches; black muck
- Oa2—4 to 55 inches; black muck
- Oa3—55 to 80 inches; dark brown muck

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: Very high

Shrink-swell potential: Not rated

Permeability: Moderately slow to moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, 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: Mc

71—Tawas muck

Setting

Landform: Depressions on moraines, lake plains, and outwash plains

Map Unit Composition

Tawas and similar soils: 100 percent

Typical Profile

Tawas

Oa1—0 to 7 inches; black muck

Oa2—7 to 15 inches; black muck

Oa3—15 to 24 inches; black muck

Cg1—24 to 30 inches; dark gray mucky sand

Cg2—30 to 55 inches; dark grayish brown sand

Cg3—55 to 80 inches; grayish brown gravelly sand

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: High

Shrink-swell potential: Low

Permeability: Moderately slow to moderately rapid in the organic material and rapid in the sandy material

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: June, July, August, September, October

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on this soil.

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

75B—Rubicon sand, 0 to 6 percent slopes***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Rubicon and similar soils: 100 percent

Typical Profile**Rubicon**

- A—0 to 4 inches; black sand
- E—4 to 9 inches; brown sand
- Bs1—9 to 16 inches; dark brown sand
- Bs2—16 to 22 inches; strong brown sand
- BC—22 to 47 inches; yellowish brown sand
- C—47 to 80 inches; yellowish brown sand

Soil Properties and Qualities

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

75D—Rubicon sand, 6 to 18 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Rubicon and similar soils: 100 percent

Typical Profile

Rubicon

A—0 to 4 inches; black sand

E—4 to 9 inches; brown sand

Bs1—9 to 16 inches; dark brown sand

Bs2—16 to 22 inches; strong brown sand

BC—22 to 47 inches; yellowish brown sand

C—47 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Slope: 6 to 18 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 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, logging roads should be stabilized.

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

78—Pits, borrow

Map Unit Composition

Pits, borrow: 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

81B—Grayling sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Grayling and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Gerrish and Graycalm soils in landscape positions similar to those of the Grayling soil
- The moderately well drained Croswell and somewhat poorly drained Au Gres soils in the slightly lower landscape positions

Typical Profile

Grayling

O_e—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw₁—2 to 7 inches; brown sand

Bw₂—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

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; 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.

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: 5.7a

81D—Grayling sand, 6 to 18 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Grayling and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Gerrish and Graycalm soils in landscape positions similar to those of the Grayling soil
- The moderately well drained Croswell and somewhat poorly drained Au Gres soils in the lower landscape positions

Typical Profile

Grayling

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw1—2 to 7 inches; brown sand

Bw2—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 6 to 18 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 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: 5.7a

81E—Grayling sand, 18 to 35 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Grayling and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Gerrish and Graycalm soils in landscape positions similar to those of the Grayling soil

Typical Profile

Grayling

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw1—2 to 7 inches; brown sand

Bw2—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 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 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 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.
- 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: 5.7a

81F—Grayling sand, 18 to 45 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Grayling and similar soils: 100 percent

Typical Profile

Grayling

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 2 inches; black sand
 Bw1—2 to 7 inches; brown sand
 Bw2—7 to 15 inches; dark yellowish brown sand
 BC—15 to 23 inches; yellowish brown sand
 C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 to 45 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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 cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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.
- 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: 5.7a

82B—Udorthents, loamy, nearly level and undulating

Map Unit Composition

Udorthents and similar soils: 100 percent

Typical Profile

Udorthents

A/C—0 to 80 inches; variable

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Slight

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

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

83B—Udipsamments, nearly level and undulating

Map Unit Composition

Udipsamments and similar soils: 100 percent

Typical Profile

Udipsamments

B—0 to 7 inches; dark yellowish brown sand

BC—7 to 13 inches; yellowish brown sand

C1—13 to 65 inches; light yellowish brown sand

C2—65 to 80 inches; pale brown sand

Soil Properties and Qualities

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

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

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

86—Histosols and Aquepts, ponded

Setting

Landform: Depressions and flats on moraines, lake plains, and outwash plains

Map Unit Composition

Histosols and similar soils: 0 to 100 percent

Aquepts and similar soils: 0 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat poorly drained Au Gres and moderately well drained Croswell soils in the higher landscape positions

Typical Profile

Histosols

Oa1—0 to 14 inches; black muck

Oa2—14 to 80 inches; black muck

Aquepts

AC—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: Histosols—very high; Aquepts—not rated

Shrink-swell potential: Not rated

Permeability: Histosols—moderately rapid; Aquepts—not rated

Flooding: None

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

Ponding depth: 0.5 foot all year

Use and Management

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

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: None assigned

87—Ausable muck, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Ausable and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Thunderbay and very poorly drained Leafriver and Tawas soils in landscape positions similar to those of the Ausable soil

Typical Profile

Ausable

- Oa—0 to 11 inches; black muck
- C—11 to 16 inches; light olive brown, mottled sand
- Cg1—16 to 23 inches; grayish brown, mottled sand with thin layers of black muck
- Cg2—23 to 48 inches; dark gray and light brownish gray, mottled sand with thin layers of black muck
- Cg3—48 to 80 inches; dark gray and light yellowish brown, mottled sand with thin layers of black muck

Soil Properties and Qualities

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: Very poorly drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Moderate or moderately rapid in the organic material and rapid in the sandy material

Frequency and most likely period of flooding: Frequent (January, February, March, April, May, November, December)

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on this soil.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of ponding and flooding, this soil is generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: L-4c

90B—Chinwhisker sand, 0 to 4 percent slopes***Setting***

Landform: Lake terraces, outwash plains, and stream terraces

Map Unit Composition

Chinwhisker and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat poorly drained Au Gres soils in the slightly lower landscape positions
- The moderately well drained Croswell soils in landscape positions similar to those of the Chinwhisker soil

Typical Profile**Chinwhisker**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 5 inches; grayish brown sand

Bs1—5 to 10 inches; brown sand

Bs2—10 to 21 inches; yellowish brown, mottled sand

Bs3—21 to 29 inches; yellowish brown, mottled sand

E and Bt1—29 to 45 inches; light olive brown, mottled sand with bands of strong brown, mottled loamy sand

E and Bt2—45 to 80 inches; light yellowish brown, mottled sand with bands of yellowish brown, mottled loamy sand

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 2.0 feet (April and May)

Ponding: None

Use and Management

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

Cropland

- Conservation tillage, windbreaks, crop residue management, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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.

Pasture

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

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

93B—Tacoda-Wakeley complex, 0 to 4 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Tacoda and similar soils: 60 percent

Wakeley and similar soils: 40 percent

Typical Profile

Tacoda

- A—0 to 3 inches; black sand
- E—3 to 15 inches; light gray, mottled sand
- Bs—15 to 23 inches; dark brown, mottled sand
- Bw—23 to 35 inches; very pale brown, mottled sand
- BC—35 to 45 inches; brown, mottled sand
- 2C—45 to 80 inches; brown, mottled silty clay

Wakeley

- Oa—0 to 7 inches; black muck
- C—7 to 22 inches; light olive brown, mottled sand
- 2Cg1—22 to 29 inches; dark gray, mottled, calcareous clay
- 2Cg2—29 to 80 inches; gray, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: Tacoda—0 to 4 percent; Wakeley—0 to 2 percent

Hazard of soil blowing: Tacoda—severe; Wakeley—moderate

Surface runoff class: Very low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Tacoda—somewhat poorly drained; Wakeley—poorly drained

Available water capacity: Low

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: Tacoda—0.5 foot to 3.5 feet (April and May);

Wakeley—at the surface (January, February, March, April, May, June, September, October, November, December)

Months in which ponding does not occur: Wakeley—June, July, August, September, October

Depth and most likely period of ponding: Wakeley—0.5 foot (January, February, March, April, May, November, December); Tacoda—not ponded

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on the Wakeley 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.

- Because of ponding, the Wakeley soil is generally unsuited to building site development.

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

Interpretive Groups

Land capability classification: 4w

Michigan soil management group: Tacoda—4/1b; Wakeley—4/1c

94F—Klacking-McGinn loamy sands, 8 to 50 percent slopes, dissected

Setting

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Klacking and similar soils: 65 percent

McGinn and similar soils: 35 percent

Typical Profile

Klacking

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 3 inches; very dark grayish brown loamy sand
- Bw1—3 to 13 inches; dark yellowish brown sand
- Bw2—13 to 21 inches; yellowish brown sand
- E and Bt—21 to 39 inches; light yellowish brown sand with bands of brown loamy sand
- B/E—39 to 46 inches; brown sandy loam and yellowish brown sand
- E and B't—46 to 80 inches; light yellowish brown sand with bands of brown loamy sand

McGinn

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; light brownish gray loamy sand
- Bw—4 to 16 inches; strong brown and dark yellowish brown loamy sand
- E'—16 to 18 inches; grayish brown loamy sand
- E/B—18 to 21 inches; grayish brown loamy sand and reddish brown sandy loam
- B/E—21 to 25 inches; reddish brown sandy loam and grayish brown loamy sand
- Bt—25 to 35 inches; reddish brown sandy loam
- C—35 to 80 inches; light reddish brown sandy loam

Soil Properties and Qualities

Slope: 8 to 50 percent

Hazard of soil blowing: Moderate

Surface runoff class: Klacking—medium; McGinn—high

Potential for frost action: Klacking—low; McGinn—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: Klacking—rapid or moderately rapid; McGinn—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 in areas of the McGinn soil 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.
- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.

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: 7e

Michigan soil management group: Klacking—4a; McGinn—3a

96D2—Mongo silty clay loam, 12 to 18 percent slopes, eroded

Setting

Landform: Lake plains

Map Unit Composition

Mongo and similar soils: 100 percent

Typical Profile

Mongo

- A—0 to 6 inches; dark brown silty clay loam
- B/E—6 to 10 inches; reddish brown silty clay loam and silty clay
- Bt—10 to 40 inches; reddish brown silty clay
- C—40 to 80 inches; stratified brown silty clay loam with thin lenses of silt loam

Soil Properties and Qualities

- Slope:* 12 to 18 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:* High
- 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—cropland; other use—building site development

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.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

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 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.

- 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: 1.5a

98C—Graycalm sand, pitted outwash, 0 to 12 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 0 to 12 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

110D—Mongo silt loam, 12 to 18 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Mongo and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Springport and Wakeley soils in the lower landscape positions
- The somewhat poorly drained Allendale and Algonquin soils in the lower landscape positions

Typical Profile

Mongo

A—0 to 7 inches; black silt loam

B/E—7 to 16 inches; brown clay and grayish brown silty clay

Bt—16 to 23 inches; dark brown clay

BC—23 to 44 inches; brown, calcareous clay

C—44 to 80 inches; brown, calcareous clay

Soil Properties and Qualities

Slope: 12 to 18 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: Low

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; other use—cropland, 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.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.

Pasture

- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of 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.
- 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 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.
- 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: 1.5a

110F—Mongo silt loam, 25 to 45 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Mongo and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Springport and Wakeley soils in the lower landscape positions
- The somewhat poorly drained Allendale and Algonquin soils in the lower landscape positions

Typical Profile

Mongo

- A—0 to 7 inches; black silt loam
- B/E—7 to 16 inches; brown clay and grayish brown silty clay
- Bt—16 to 23 inches; dark brown clay
- BC—23 to 44 inches; brown, calcareous clay
- C—44 to 80 inches; brown, calcareous clay

Soil Properties and Qualities

- Slope:* 18 to 35 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:* High
- 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. 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.

- 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: 7e

Michigan soil management group: 1.5a

111B—Kellogg loamy sand, 0 to 6 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Kellogg and similar soils: 100 percent

Typical Profile

Kellogg

A—0 to 4 inches; black loamy sand

E—4 to 6 inches; pinkish gray loamy sand

Bs1—6 to 17 inches; strong brown loamy sand

Bs2—17 to 24 inches; strong brown loamy sand

2B/E—24 to 27 inches; reddish brown clay and pinkish gray, mottled sandy loam

2Bt1—27 to 32 inches; reddish brown, mottled clay

2Bt2—32 to 50 inches; reddish brown clay

2C—50 to 80 inches; reddish brown, calcareous clay

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Low to 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: 2.0 to 3.0 feet (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, 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.
- 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: 3s

Michigan soil management group: 4/1a

111C—Kellogg loamy sand, 6 to 12 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Kellogg and similar soils: 100 percent

Typical Profile

Kellogg

A—0 to 4 inches; black loamy sand

E—4 to 6 inches; pinkish gray loamy sand

Bs1—6 to 17 inches; strong brown loamy sand

Bs2—17 to 24 inches; strong brown loamy sand

2B/E—24 to 27 inches; reddish brown clay and pinkish gray, mottled sandy loam

2Bt1—27 to 32 inches; reddish brown, mottled clay

2Bt2—32 to 50 inches; reddish brown clay

2C—50 to 80 inches; reddish brown, calcareous clay

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well 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: 2.0 to 3.0 feet (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, 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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 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: 3s

Michigan soil management group: 4/1a

116B—Mancelona sand, 0 to 6 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Mancelona and similar soils: 100 percent

Typical Profile

Mancelona

A—0 to 3 inches; black sand

E—3 to 6 inches; pinkish gray sand

Bs1—6 to 16 inches; brown sand

Bs2—16 to 20 inches; yellowish brown sand

E'—20 to 29 inches; light yellowish brown sand

2Bt—29 to 35 inches; reddish brown gravelly sandy loam

2C—35 to 80 inches; yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

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: Moderately rapid in the upper part and very 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.
- 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

116C—Mancelona sand, 6 to 12 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Mancelona and similar soils: 100 percent

Typical Profile

Mancelona

A—0 to 3 inches; black sand
 E—3 to 6 inches; pinkish gray sand
 Bs1—6 to 16 inches; brown sand
 Bs2—16 to 20 inches; yellowish brown sand
 E'—20 to 29 inches; light yellowish brown sand
 2Bt—29 to 35 inches; reddish brown gravelly sandy loam
 2C—35 to 80 inches; yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately rapid in the upper part and very 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

- 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: 4a

116D—Mancelona sand, 12 to 18 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Mancelona and similar soils: 100 percent

Typical Profile

Mancelona

A—0 to 3 inches; black sand

E—3 to 6 inches; pinkish gray sand

Bs1—6 to 16 inches; brown sand

Bs2—16 to 20 inches; yellowish brown sand

E'—20 to 29 inches; light yellowish brown sand

2Bt—29 to 35 inches; reddish brown gravelly sandy loam

2C—35 to 80 inches; yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

Slope: 12 to 18 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: Moderately rapid in the upper part and very 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 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: 4e

Michigan soil management group: 4a

116E—Mancelona sand, 18 to 35 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Mancelona and similar soils: 100 percent

Typical Profile

Mancelona

A—0 to 3 inches; black sand

E—3 to 6 inches; pinkish gray sand
 Bs1—6 to 16 inches; brown sand
 Bs2—16 to 20 inches; yellowish brown sand
 E'—20 to 29 inches; light yellowish brown sand
 2Bt—29 to 35 inches; reddish brown gravelly sandy loam
 2C—35 to 80 inches; yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

Slope: 18 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: Moderately rapid in the upper part and very 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 cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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.
- 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: 7e
Michigan soil management group: 4a

123D—Klacking sand, 6 to 18 percent slopes

Setting

Landform: Moraines, outwash plains, and kames

Map Unit Composition

Klacking and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Graycalm and Horsehead, and moderately well drained Perecheney soils in landscape positions similar to those of the Klacking soil

Typical Profile

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 6 to 18 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 or 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; other use—building site development

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 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: 4e

Michigan soil management group: 4a

125B—Melita sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Melita and similar soils: 100 percent

Typical Profile

Melita

- A—0 to 4 inches; very dark gray sand
- E—4 to 8 inches; light brownish gray sand
- Bs—8 to 16 inches; brown sand
- Bw—16 to 43 inches; strong brown and very pale brown sand
- 2Bt—43 to 47 inches; reddish brown silty clay loam
- 2C—47 to 80 inches; light reddish brown and light gray silty clay loam

Soil Properties and Qualities

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 in the upper part and moderately 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.

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.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5/2a

144B—Perecheney sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Perecheney and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to or slightly higher than those of the Perecheney soil
- The moderately well drained Morganlake soils in landscape positions similar to those of the Perecheney soil

Typical Profile

Perecheney

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; brown sand

Bw1—7 to 12 inches; dark yellowish brown sand

Bw2—12 to 21 inches; brownish yellow sand

E'—21 to 28 inches; light yellowish brown loamy sand

2B/E—28 to 42 inches; brown loam, sandy clay loam, and sandy loam and light yellowish brown sand

- 2BC—42 to 44 inches; mottled, calcareous, strong brown, brown, and brownish yellow loamy sand, sandy loam, very fine sandy loam, and sand
 3C—44 to 80 inches; light yellowish brown, calcareous sand

Soil Properties and Qualities

- 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: Moderately well drained
Available water capacity: Moderate
Shrink-swell potential: Low
Permeability: Rapid in the sandy material and moderately slow in the loamy material
Flooding: None
Depth to seasonal high water table: 2.5 to 6.0 feet (January, February, March, April, May, November, December)
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 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: 4s
Michigan soil management group: 4/2c

144C—Perecheney sand, 6 to 12 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Perechenev and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to or slightly higher than those of the Perechenev soil
- The moderately well drained Morganlake soils in landscape positions similar to those of the Perechenev soil

Typical Profile

Perechenev

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; brown sand

Bw1—7 to 12 inches; dark yellowish brown sand

Bw2—12 to 21 inches; brownish yellow sand

E'—21 to 28 inches; light yellowish brown loamy sand

2B/E—28 to 42 inches; brown loam, sandy clay loam, and sandy loam and light yellowish brown sand

2BC—42 to 44 inches; mottled, calcareous, strong brown, brown, and brownish yellow loamy sand, sandy loam, very fine sandy loam, and sand

3C—44 to 80 inches; light yellowish brown, calcareous sand

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Rapid in the sandy material and moderately slow in the loamy material

Flooding: None

Depth to seasonal high water table: 2.5 to 6.0 feet (January, February, March, April, May, November, December)

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

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 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: 4s

Michigan soil management group: 4/2c

200—Borrow source***Map Unit Composition***

Borrow source: 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

210B—Grayling sand, nearly level and undulating***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Grayling and similar soils: 100 percent

Typical Profile**Grayling**

- A—0 to 4 inches; black sand
- Bw1—4 to 18 inches; dark yellowish brown sand
- Bw2—18 to 26 inches; yellowish brown sand
- BC—26 to 84 inches; light yellowish brown sand
- C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

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.

Interpretive Groups

Land capability classification: 6s
Michigan soil management group: 5.7a

210C—Grayling sand, rolling

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Grayling and similar soils: 100 percent

Typical Profile

Grayling

A—0 to 4 inches; black sand
 Bw1—4 to 18 inches; dark yellowish brown sand
 Bw2—18 to 26 inches; yellowish brown sand
 BC—26 to 84 inches; light yellowish brown sand
 C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 6 to 18 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 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.7a

210D—Grayling sand, hilly***Setting***

Landform: Moraines and outwash plains

Map Unit Composition

Grayling and similar soils: 100 percent

Typical Profile**Grayling**

- A—0 to 4 inches; black sand
- Bw1—4 to 18 inches; dark yellowish brown sand
- Bw2—18 to 26 inches; yellowish brown sand
- BC—26 to 84 inches; light yellowish brown sand
- C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 18 to 30 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 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.7a

210E—Grayling sand, steep

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Grayling and similar soils: 100 percent

Typical Profile

Grayling

- A—0 to 4 inches; black sand
- Bw1—4 to 18 inches; dark yellowish brown sand
- Bw2—18 to 26 inches; yellowish brown sand
- BC—26 to 84 inches; light yellowish brown sand
- C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 30 to 45 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: 5.7a

211B—Grayling, banded substratum-Graycalm sands, nearly level and undulating

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Grayling, banded substratum, and similar soils: 60 percent

Graycalm and similar soils: 40 percent

Typical Profile

Grayling, banded substratum

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; dark brown sand

Bw—4 to 28 inches; dark yellowish brown sand

BC—28 to 81 inches; brownish yellow sand

E and Bt—81 to 155 inches; light yellowish brown sand with bands of dark yellowish brown fine sand, coarse sand, and loamy sand

C—155 to 180 inches; light yellowish brown sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 180 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

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: Grayling—excessively drained; Graycalm—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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: Grayling—5.7a; Graycalm—5a

211C—Grayling, banded substratum-Graycalm sands, rolling

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Grayling, banded substratum, and similar soils: 60 percent

Graycalm and similar soils: 40 percent

Typical Profile

Grayling, banded substratum

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; dark brown sand

Bw—4 to 28 inches; dark yellowish brown sand

BC—28 to 81 inches; brownish yellow sand

E and Bt—81 to 155 inches; light yellowish brown sand with bands of dark yellowish brown fine sand, coarse sand, and loamy sand

C—155 to 180 inches; light yellowish brown sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 180 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 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: Grayling—excessively drained; Graycalm—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.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Grayling—5.7a; Graycalm—5.7a

211D—Grayling, banded substratum-Graycalm sands, hilly

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Grayling, banded substratum, and similar soils: 60 percent

Graycalm and similar soils: 40 percent

Typical Profile

Grayling, banded substratum

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; dark brown sand

Bw—4 to 28 inches; dark yellowish brown sand

BC—28 to 81 inches; brownish yellow sand

E and Bt—81 to 155 inches; light yellowish brown sand with bands of dark yellowish brown fine sand, coarse sand, and loamy sand

C—155 to 180 inches; light yellowish brown sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 180 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 18 to 30 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: Grayling—excessively drained; Graycalm—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.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Grayling—5.7a; Graycalm—5a

211E—Grayling, banded substratum-Graycalm sands, steep

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Grayling, banded substratum, and similar soils: 60 percent

Graycalm and similar soils: 40 percent

Typical Profile

Grayling, banded substratum

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 4 inches; dark brown sand

Bw—4 to 28 inches; dark yellowish brown sand

BC—28 to 81 inches; brownish yellow sand

E and Bt—81 to 155 inches; light yellowish brown sand with bands of dark yellowish brown fine sand, coarse sand, and loamy sand

C—155 to 180 inches; light yellowish brown sand

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 180 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 30 to 45 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: Grayling—excessively drained; Graycalm—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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Grayling—5.7a; Graycalm—5a

212B—Grayling sand, very deep water table, nearly level and undulating***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Grayling sand, very deep water table, and similar soils: 100 percent

Typical Profile

Grayling

- A—0 to 4 inches; black sand
- Bw1—4 to 18 inches; dark yellowish brown sand
- Bw2—18 to 26 inches; yellowish brown sand
- BC—26 to 84 inches; light yellowish brown sand
- C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

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: 6.0 to 14.0 feet all year

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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5.7a

213B—Graycalm sand, nearly level and undulating

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand
 E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

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.

Interpretive Groups

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

213C—Graycalm sand, rolling

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 2 inches; black sand
 E—2 to 3 inches; grayish brown sand
 Bw1—3 to 7 inches; dark yellowish brown sand
 Bw2—7 to 17 inches; dark yellowish brown sand
 Bw3—17 to 24 inches; yellowish brown sand
 E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 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 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.

Interpretive Groups

Land capability classification: 6s
Michigan soil management group: 5a

213D—Graycalm sand, hilly

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 100 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 2 inches; black sand
 E—2 to 3 inches; grayish brown sand
 Bw1—3 to 7 inches; dark yellowish brown sand
 Bw2—7 to 17 inches; dark yellowish brown sand
 Bw3—17 to 24 inches; yellowish brown sand
 E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 18 to 30 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 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: 5a

214B—Oxyaquic Udipsamments, nearly level and undulating

Setting

Landform: Stream terraces, outwash plains, and moraines

Map Unit Composition

Oxyaquic Udipsamments and similar soils: 100 percent

Typical Profile

Oxyaquic Udipsamments

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 5 inches; very dark brown sand

Bw1—5 to 15 inches; strong brown sand

Bw2—15 to 25 inches; yellowish brown, mottled sand

BC—25 to 34 inches; brownish yellow, mottled sand

C1—34 to 43 inches; light yellowish brown, mottled sand

C2—43 to 71 inches; brown, mottled coarse sand

C3—71 to 80 inches; brown, mottled sand

Soil Properties and Qualities

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: 3.5 to 15.0 feet (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, logging roads should be stabilized.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

215B—Typic Udipsamments, loamy substratum, nearly level and undulating

Setting

Landform: Stream terraces, moraines, and outwash plains

Map Unit Composition

Typic Udipsamments, loamy substratum, and similar soils: 100 percent

Typical Profile

Typic Udipsamments

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; very dark gray sand

E—3 to 4 inches; dark grayish brown sand

Bw1—4 to 24 inches; dark yellowish brown sand

Bw2—24 to 32 inches; yellowish brown sand

C—32 to 78 inches; light yellowish brown sand

2C—78 to 102 inches; brown clay loam

Soil Properties and Qualities

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: High

Permeability: Rapid in the upper part and moderately 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

215C—Typic Udipsamments, loamy substratum, rolling***Setting***

Landform: Moraines, stream terraces, and outwash plains

Map Unit Composition

Typic Udipsamments, loamy substratum, and similar soils: 100 percent

Typical Profile**Typic Udipsamments**

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 3 inches; very dark gray sand
- E—3 to 4 inches; dark grayish brown sand
- Bw1—4 to 24 inches; dark yellowish brown sand
- Bw2—24 to 32 inches; yellowish brown sand
- C—32 to 78 inches; light yellowish brown sand
- 2C—78 to 102 inches; brown clay loam

Soil Properties and Qualities

Slope: 6 to 18 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: High

Permeability: Rapid in the upper part and moderately 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 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

215D—Typic Udipsamments, loamy substratum, hilly

Setting

Landform: Moraines, stream terraces, and outwash plains

Map Unit Composition

Typic Udipsamments, loamy substratum, and similar soils: 100 percent

Typical Profile

Typic Udipsamments

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 3 inches; very dark gray sand
- E—3 to 4 inches; dark grayish brown sand
- Bw1—4 to 24 inches; dark yellowish brown sand
- Bw2—24 to 32 inches; yellowish brown sand
- C—32 to 78 inches; light yellowish brown sand
- 2C—78 to 102 inches; brown clay loam

Soil Properties and Qualities

Slope: 18 to 30 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: High

Permeability: Rapid to 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

- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

220B—Typic Udipsamments, nearly level and undulating

Setting

Landform: Stream terraces, moraines, and outwash plains

Map Unit Composition

Typic Udipsamments and similar soils: 100 percent

Typical Profile

Typic Udipsamments

O_i—0 to 1 inch; slightly decomposed plant material

A—1 to 3 inches; very dark gray sand

E—3 to 5 inches; light brownish gray sand

B_w—5 to 23 inches; dark yellowish brown sand

BC—23 to 41 inches; yellowish brown sand

C—41 to 180 inches; light yellowish brown sand

Soil Properties and Qualities

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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

220C—Typic Udipsamments, rolling

Setting

Landform: Stream terraces, moraines, and outwash plains

Map Unit Composition

Typic Udipsamments and similar soils: 100 percent

Typical Profile

Typic Udipsamments

- Oi—0 to 1 inch; slightly decomposed plant material
- A—1 to 3 inches; very dark gray sand
- E—3 to 5 inches; light brownish gray sand
- Bw—5 to 23 inches; dark yellowish brown sand
- BC—23 to 41 inches; yellowish brown sand
- C—41 to 180 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 6 to 18 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 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.

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: None assigned

220D—Typic Udipsamments, hilly

Setting

Landform: Moraines, outwash plains, and stream terraces

Map Unit Composition

Typic Udipsamments and similar soils: 100 percent

Typical Profile

Typic Udipsamments

- Oi—0 to 1 inch; slightly decomposed plant material
- A—1 to 3 inches; very dark gray sand
- E—3 to 5 inches; light brownish gray sand
- Bw—5 to 23 inches; dark yellowish brown sand
- BC—23 to 41 inches; yellowish brown sand
- C—41 to 180 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 to 30 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 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.

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: None assigned

220E—Typic Udipsamments, steep

Setting

Landform: Stream terraces, moraines, and outwash plains

Map Unit Composition

Typic Udipsamments and similar soils: 100 percent

Typical Profile

Typic Udipsamments

- Oi—0 to 1 inch; slightly decomposed plant material

- A—1 to 3 inches; very dark gray sand
- E—3 to 5 inches; light brownish gray sand
- Bw—5 to 23 inches; dark yellowish brown sand
- BC—23 to 41 inches; yellowish brown sand
- C—41 to 180 inches; light yellowish brown sand

Soil Properties and Qualities

- Slope:* 30 to 45 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

- Land capability classification:* 7s
- Michigan soil management group:* None assigned

221B—Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, nearly level and undulating

Setting

Landform: Stream terraces, outwash plains, and moraines

Map Unit Composition

- Typic Udipsamments, banded substratum, and similar soils: 60 percent
- Lamellic Udipsamments and similar soils: 40 percent

Typical Profile

Typic Udipsamments, banded substratum

- Oa—0 to 1 inch; highly decomposed plant material
- A—1 to 3 inches; very dark grayish brown sand
- E—3 to 5 inches; dark yellowish brown sand
- Bw1—5 to 12 inches; yellowish brown sand
- Bw2—12 to 18 inches; brownish yellow sand
- Bw3—18 to 30 inches; yellow sand
- BC—30 to 90 inches; very pale brown and yellowish brown sand
- C1—90 to 105 inches; light yellowish brown sand with bands of dark yellowish brown fine sandy loam
- C2—105 to 180 inches; brown sand

Lamellic Udipsamments

- Oe—0 to 1 inch; moderately decomposed plant material
- Ap—1 to 12 inches; black sand
- Bw—12 to 27 inches; dark yellowish brown sand
- BC—27 to 58 inches; brownish yellow sand
- E and Bt—58 to 180 inches; light yellowish brown sand with bands of dark yellowish brown loamy sand

Soil Properties and Qualities

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: Typic Udipsamments, banded substratum—excessively drained;
Lamellic Udipsamments—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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

221C—Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, rolling

Setting

Landform: Moraines, stream terraces, and outwash plains

Map Unit Composition

Typic Udipsamments, banded substratum, and similar soils: 60 percent

Lamellic Udipsamments and similar soils: 40 percent

Typical Profile

Typic Udipsamments, banded substratum

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 3 inches; very dark grayish brown sand

E—3 to 5 inches; dark yellowish brown sand

Bw1—5 to 12 inches; yellowish brown sand

Bw2—12 to 18 inches; brownish yellow sand

Bw3—18 to 30 inches; yellow sand

BC—30 to 90 inches; very pale brown and yellowish brown sand

C1—90 to 105 inches; light yellowish brown sand with bands of dark yellowish brown fine sandy loam

C2—105 to 180 inches; brown sand

Lamellic Udipsamments

Oe—0 to 1 inch; moderately decomposed plant material

Ap—1 to 12 inches; black sand

Bw—12 to 27 inches; dark yellowish brown sand

BC—27 to 58 inches; brownish yellow sand

E and Bt—58 to 180 inches; light yellowish brown sand with bands of dark yellowish brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 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: Typic Udipsamments, banded substratum—excessively drained;

Lamellic Udipsamments—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.
- 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, these soils are poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 7s

Michigan soil management group: None assigned

221D—Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, hilly

Setting

Landform: Stream terraces, outwash plains, and moraines

Map Unit Composition

Typic Udipsamments, banded substratum, and similar soils: 60 percent

Lamellic Udipsamments and similar soils: 40 percent

Typical Profile**Typic Udipsamments, banded substratum**

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 3 inches; very dark grayish brown sand

E—3 to 5 inches; dark yellowish brown sand

Bw1—5 to 12 inches; yellowish brown sand

Bw2—12 to 18 inches; brownish yellow sand

Bw3—18 to 30 inches; yellow sand

BC—30 to 90 inches; very pale brown and yellowish brown sand

C1—90 to 105 inches; light yellowish brown sand with bands of dark yellowish brown fine sandy loam

C2—105 to 180 inches; brown sand

Lamellic Udipsamments

Oe—0 to 1 inch; moderately decomposed plant material

Ap—1 to 12 inches; black sand

Bw—12 to 27 inches; dark yellowish brown sand

BC—27 to 58 inches; brownish yellow sand

E and Bt—58 to 180 inches; light yellowish brown sand with bands of dark yellowish brown loamy sand

Soil Properties and Qualities

Slope: 18 to 30 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: Typic Udipsamments, banded substratum—excessively drained;
Lamellic Udipsamments—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.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

221E—Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, steep

Setting

Landform: Stream terraces, moraines, and outwash plains

Map Unit Composition

Typic Udipsamments, banded substratum, and similar soils: 60 percent

Lamellic Udipsamments and similar soils: 40 percent

Typical Profile

Typic Udipsamments, banded substratum

Oa—0 to 1 inch; highly decomposed plant material

A—1 to 3 inches; very dark grayish brown sand

E—3 to 5 inches; dark yellowish brown sand

Bw1—5 to 12 inches; yellowish brown sand

Bw2—12 to 18 inches; brownish yellow sand

Bw3—18 to 30 inches; yellow sand

BC—30 to 90 inches; very pale brown and yellowish brown sand

C1—90 to 105 inches; light yellowish brown sand with bands of dark yellowish brown fine sandy loam

C2—105 to 180 inches; brown sand

Lamellic Udipsamments

- Oe—0 to 1 inch; moderately decomposed plant material
- Ap—1 to 12 inches; black sand
- Bw—12 to 27 inches; dark yellowish brown sand
- BC—27 to 58 inches; brownish yellow sand
- E and Bt—58 to 180 inches; light yellowish brown sand with bands of dark yellowish brown loamy sand

Soil Properties and Qualities

- Slope:* 30 to 45 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:* Typic Udipsamments, banded substratum—excessively drained;
Lamellic Udipsamments—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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

- Land capability classification:* 7s
- Michigan soil management group:* None assigned

222B—Typic Udipsamments, very deep water table, nearly level and undulating**Setting**

Landform: Moraines, outwash plains, and stream terraces

Map Unit Composition

Typic Udipsamments, very deep water table, and similar soils: 100 percent

Typical Profile

Typic Udipsamments

- Oi—0 to 1 inch; slightly decomposed plant material
- A—1 to 3 inches; very dark gray sand
- E—3 to 5 inches; light brownish gray sand
- Bw—5 to 23 inches; dark yellowish brown sand
- BC—23 to 41 inches; yellowish brown sand
- C—41 to 180 inches; light yellowish brown sand

Soil Properties and Qualities

- 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:* 6.0 to 15.0 feet all year
- 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.

Interpretive Groups

- Land capability classification:* 6s
- Michigan soil management group:* None assigned

223B—Graycalm-Grayling sands, nearly level and undulating

Setting

Landform: Outwash plains and moraines

Map Unit Composition

- Graycalm and similar soils: 60 percent
- Grayling and similar soils: 40 percent

Typical Profile

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

A—0 to 4 inches; black sand
 Bw1—4 to 18 inches; dark yellowish brown sand
 Bw2—18 to 26 inches; yellowish brown sand
 BC—26 to 84 inches; light yellowish brown sand
 C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

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: Graycalm—somewhat excessively drained; Grayling—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.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

223C—Graycalm-Grayling sands, rolling

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 60 percent

Grayling and similar soils: 40 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 2 inches; black sand
 E—2 to 3 inches; grayish brown sand
 Bw1—3 to 7 inches; dark yellowish brown sand
 Bw2—7 to 17 inches; dark yellowish brown sand
 Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

A—0 to 4 inches; black sand
 Bw1—4 to 18 inches; dark yellowish brown sand
 Bw2—18 to 26 inches; yellowish brown sand
 BC—26 to 84 inches; light yellowish brown sand
 C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 6 to 18 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: Graycalm—somewhat excessively drained; Grayling—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.
- 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

223D—Graycalm-Grayling sands, hilly

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 60 percent

Grayling and similar soils: 40 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 2 inches; black sand
 E—2 to 3 inches; grayish brown sand
 Bw1—3 to 7 inches; dark yellowish brown sand
 Bw2—7 to 17 inches; dark yellowish brown sand
 Bw3—17 to 24 inches; yellowish brown sand
 E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

A—0 to 4 inches; black sand
 Bw1—4 to 18 inches; dark yellowish brown sand
 Bw2—18 to 26 inches; yellowish brown sand
 BC—26 to 84 inches; light yellowish brown sand
 C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 18 to 30 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: Graycalm—somewhat excessively drained; Grayling—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.
- 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

223E—Graycalm-Grayling sands, steep

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 60 percent

Grayling and similar soils: 40 percent

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Grayling

A—0 to 4 inches; black sand

Bw1—4 to 18 inches; dark yellowish brown sand

Bw2—18 to 26 inches; yellowish brown sand

BC—26 to 84 inches; light yellowish brown sand

C—84 to 168 inches; pale brown sand

Soil Properties and Qualities

Slope: 30 to 45 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: Graycalm—somewhat excessively drained; Grayling—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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.

- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: Graycalm—5a; Grayling—5.7a

224B—Crowell sand, nearly level and undulating

Setting

Landform: Lake plains, moraines, and outwash plains

Map Unit Composition

Crowell and similar soils: 100 percent

Typical Profile

Crowell

- A—0 to 2 inches; black sand
- E—2 to 8 inches; brown sand
- Bs1—8 to 12 inches; dark brown sand
- Bs2—12 to 19 inches; strong brown sand
- BC—19 to 33 inches; light yellowish brown, mottled sand
- C—33 to 80 inches; brown and light brownish gray, mottled sand

Soil Properties and Qualities

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: 2.0 feet (April and 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.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: 5a

225B—Entic Haplorthods, sandy, loamy substratum, nearly level and undulating

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, loamy substratum, and similar soils: 100 percent

Typical Profile

Entic Haplorthods

A—0 to 2 inches; very dark gray sand

E—2 to 3 inches; gray sand

Bs1—3 to 10 inches; brown sand

Bs2—10 to 26 inches; strong brown sand

BC—26 to 32 inches; yellowish brown sand

C1—32 to 76 inches; light yellowish brown sand and brownish yellow coarse sand

C2—76 to 148 inches; light yellowish brown sand with bands of brown very fine sandy loam and sandy clay loam

C3—148 to 180 inches; very pale brown fine sand, brown loamy fine sand, and dark yellowish brown clay loam

Soil Properties and Qualities

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 in the upper part and moderate or moderately 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

225C—Entic Haplorthods, sandy, loamy substratum, rolling

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, loamy substratum, and similar soils: 100 percent

Typical Profile

Entic Haplorthods

A—0 to 2 inches; very dark gray sand

E—2 to 3 inches; gray sand

Bs1—3 to 10 inches; brown sand

Bs2—10 to 26 inches; strong brown sand

BC—26 to 32 inches; yellowish brown sand

C1—32 to 76 inches; light yellowish brown sand and brownish yellow coarse sand

C2—76 to 148 inches; light yellowish brown sand with bands of brown very fine sandy loam and sandy clay loam

C3—148 to 180 inches; very pale brown fine sand, brown loamy fine sand, and dark yellowish brown clay loam

Soil Properties and Qualities

Slope: 6 to 18 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 in the upper part and moderate or moderately 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 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

225D—Entic Haplorthods, sandy, loamy substratum, hilly

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, loamy substratum, and similar soils: 100 percent

Typical Profile

Entic Haplorthods

A—0 to 2 inches; very dark gray sand

E—2 to 3 inches; gray sand

Bs1—3 to 10 inches; brown sand

Bs2—10 to 26 inches; strong brown sand

BC—26 to 32 inches; yellowish brown sand

C1—32 to 76 inches; light yellowish brown sand and brownish yellow coarse sand

C2—76 to 148 inches; light yellowish brown sand with bands of brown very fine sandy loam and sandy clay loam

C3—148 to 180 inches; very pale brown fine sand, brown loamy fine sand, and dark yellowish brown clay loam

Soil Properties and Qualities

Slope: 18 to 30 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 in the upper part and moderate or moderately 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 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

225E—Entic Haplorthods, sandy, loamy substratum, steep

Setting

Landform: Moraines, lake plains, and outwash plains

Map Unit Composition

Entic Haplorthods, sandy, loamy substratum, and similar soils: 100 percent

Typical Profile

Entic Haplorthods

A—0 to 2 inches; very dark gray sand

E—2 to 3 inches; gray sand

Bs1—3 to 10 inches; brown sand

Bs2—10 to 26 inches; strong brown sand

BC—26 to 32 inches; yellowish brown sand

C1—32 to 76 inches; light yellowish brown sand and brownish yellow coarse sand

C2—76 to 148 inches; light yellowish brown sand with bands of brown very fine sandy loam and sandy clay loam

C3—148 to 180 inches; very pale brown fine sand, brown loamy fine sand, and dark yellowish brown clay loam

Soil Properties and Qualities

Slope: 30 to 45 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 in the upper part and moderate or moderately 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.

- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

230C—Entic Haplorthods-Alfic Haplorthods complex, sandy, rolling

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Entic Haplorthods

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; black sand

E—3 to 7 inches; brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 23 inches; strong brown sand

BC—23 to 30 inches; brownish yellow sand

C—30 to 180 inches; very pale brown and light yellowish brown sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Entic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Entic Haplorthods—excessively drained; Alfic Haplorthods—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 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

230D—Entic Haplorthods-Alfic Haplorthods complex, sandy, hilly

Setting

Landform: Moraines, lake plains, and outwash plains

Map Unit Composition

Entic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Entic Haplorthods

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; black sand

E—3 to 7 inches; brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 23 inches; strong brown sand

BC—23 to 30 inches; brownish yellow sand

C—30 to 180 inches; very pale brown and light yellowish brown sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 18 to 30 percent

Hazard of soil blowing: Entic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Entic Haplorthods—excessively drained; Alfic Haplorthods—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 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

230E—Entic Haplorthods-Alfic Haplorthods complex, sandy, steep

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Entic Haplorthods

O_e—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; black sand

E—3 to 7 inches; brown sand

Bs₁—7 to 11 inches; brown sand

Bs₂—11 to 23 inches; strong brown sand

BC—23 to 30 inches; brownish yellow sand

C—30 to 180 inches; very pale brown and light yellowish brown sand

Alfic Haplorthods

- Oe—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark grayish brown loamy sand
- E—4 to 7 inches; grayish brown sand
- Bs1—7 to 11 inches; brown sand
- Bs2—11 to 32 inches; strong brown sand
- Bw—32 to 37 inches; reddish yellow sand
- 2Bt—37 to 42 inches; brown sandy loam
- 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 30 to 45 percent

Hazard of soil blowing: Entic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Entic Haplorthods—excessively drained; Alfic Haplorthods—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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

**231B—Lamellic Haplorthods-Alfic Haplorthods complex,
sandy, nearly level and undulating*****Setting***

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Lamellic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Lamellic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

AE—2 to 3 inches; dark gray sand

E—3 to 8 inches; grayish brown sand

Bs1—8 to 14 inches; strong brown sand

Bs2—14 to 27 inches; dark yellowish brown sand

BC—27 to 36 inches; brownish yellow sand

C—36 to 62 inches; very pale brown sand

E and Bt—62 to 180 inches; very pale brown sand with bands of strong brown loamy sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Lamellic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Negligible or very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Lamellic Haplorthods—excessively drained; Alfic Haplorthods—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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

231C—Lamellic Haplorthods-Alfic Haplorthods complex, sandy, rolling

Setting

Landform: Moraines, outwash plains, and lake plains

Map Unit Composition

Lamellic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Lamellic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

AE—2 to 3 inches; dark gray sand

E—3 to 8 inches; grayish brown sand

Bs1—8 to 14 inches; strong brown sand

Bs2—14 to 27 inches; dark yellowish brown sand

BC—27 to 36 inches; brownish yellow sand

C—36 to 62 inches; very pale brown sand

E and Bt—62 to 180 inches; very pale brown sand with bands of strong brown loamy sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Lamellic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Very low or low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Lamellic Haplorthods—excessively drained; Alfic Haplorthods—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 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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

231D—Lamellic Haplorthods-Alfic Haplorthods complex, sandy, hilly

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Lamellic Haplorthods, sandy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Lamellic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

AE—2 to 3 inches; dark gray sand

E—3 to 8 inches; grayish brown sand

Bs1—8 to 14 inches; strong brown sand

Bs2—14 to 27 inches; dark yellowish brown sand

BC—27 to 36 inches; brownish yellow sand

C—36 to 62 inches; very pale brown sand

E and Bt—62 to 180 inches; very pale brown sand with bands of strong brown loamy sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 18 to 30 percent

Hazard of soil blowing: Lamellic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Very low or low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Lamellic Haplorthods—excessively drained; Alfic Haplorthods—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 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.

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: None assigned

231E—Lamellic Haplorthods-Alfic Haplorthods complex, sandy, steep

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Lamellic Haplorthods, sandy, and similar soils: 60 percent
 Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Lamellic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material
 AE—2 to 3 inches; dark gray sand
 E—3 to 8 inches; grayish brown sand
 Bs1—8 to 14 inches; strong brown sand
 Bs2—14 to 27 inches; dark yellowish brown sand
 BC—27 to 36 inches; brownish yellow sand
 C—36 to 62 inches; very pale brown sand
 E and Bt—62 to 180 inches; very pale brown sand with bands of strong brown loamy sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material
 A—2 to 4 inches; very dark grayish brown loamy sand
 E—4 to 7 inches; grayish brown sand
 Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand
 Bw—32 to 37 inches; reddish yellow sand
 2Bt—37 to 42 inches; brown sandy loam
 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 30 to 45 percent
Hazard of soil blowing: Lamellic Haplorthods—severe; Alfic Haplorthods—moderate
Surface runoff class: Low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Lamellic Haplorthods—excessively drained; Alfic Haplorthods—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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7s
Michigan soil management group: None assigned

232B—Entic Haplorthods-Alfic Haplorthods complex, sandy, very deep water table, nearly level and undulating

Setting

Landform: Outwash plains, lake plains, and moraines

Map Unit Composition

Entic Haplorthods, sandy, very deep water table, and similar soils: 60 percent
 Alfic Haplorthods, sandy, very deep water table, and similar soils: 40 percent

Typical Profile

Entic Haplorthods

Oe—0 to 1 inch; moderately decomposed plant material
 A—1 to 3 inches; black sand
 E—3 to 7 inches; brown sand
 Bs1—7 to 11 inches; brown sand
 Bs2—11 to 23 inches; strong brown sand
 BC—23 to 30 inches; brownish yellow sand
 C—30 to 180 inches; very pale brown and light yellowish brown sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material
 A—2 to 4 inches; very dark grayish brown loamy sand
 E—4 to 7 inches; grayish brown sand
 Bs1—7 to 11 inches; brown sand
 Bs2—11 to 32 inches; strong brown sand
 Bw—32 to 37 inches; reddish yellow sand
 2Bt—37 to 42 inches; brown sandy loam
 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Entic Haplorthods—severe; Alfic Haplorthods—moderate

Hazard of soil blowing: Severe

Surface runoff class: Negligible or very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Entic Haplorthods—excessively drained; Alfic Haplorthods—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 6.0 to 15.0 feet all year

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.

Interpretive Groups

Land capability classification: 6s

Michigan soil management group: None assigned

232D—Entic Haplorthods-Alfic Haplorthods complex, sandy, very deep water table, hilly

Setting

Landform: Lake plains, moraines, and outwash plains

Map Unit Composition

Entic Haplorthods, sandy, very deep water table, and similar soils: 60 percent

Alfic Haplorthods, sandy, very deep water table, and similar soils: 40 percent

Typical Profile

Entic Haplorthods

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 3 inches; black sand

E—3 to 7 inches; brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 23 inches; strong brown sand

BC—23 to 30 inches; brownish yellow sand

C—30 to 180 inches; very pale brown and light yellowish brown sand

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 18 to 30 percent

Hazard of soil blowing: Entic Haplorthods—severe; Alfic Haplorthods—moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Entic Haplorthods—excessively drained; Alfic Haplorthods—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 6.0 to 15.0 feet all year

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.

Interpretive Groups

Land capability classification: 7s

Michigan soil management group: None assigned

233B—Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, nearly level and undulating

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy, and similar soils: 60 percent

Entic Haplorthods, sandy, fine-loamy banded substratum, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Entic Haplorthods

Oi—0 to 1 inch; slightly decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; light brownish gray sand

Bs1—3 to 11 inches; brown sand

Bs2—11 to 24 inches; strong brown sand

BC—24 to 40 inches; yellowish brown sand

C1—40 to 55 inches; yellowish brown sandy clay loam

C2—55 to 180 inches; yellowish brown sand with bands of dark yellowish brown sandy loam and brown sandy clay loam

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Alfic Haplorthods—moderate; Entic Haplorthods—severe

Hazard of soil blowing: Moderate

Surface runoff class: Negligible or very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Alfic Haplorthods—well drained; Entic Haplorthods—excessively drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: Rapid; or 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.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: None assigned

233C—Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, rolling

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy, and similar soils: 60 percent

Entic Haplorthods, sandy, fine-loamy banded substratum, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods

- Oe—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark grayish brown loamy sand
- E—4 to 7 inches; grayish brown sand
- Bs1—7 to 11 inches; brown sand
- Bs2—11 to 32 inches; strong brown sand
- Bw—32 to 37 inches; reddish yellow sand
- 2Bt—37 to 42 inches; brown sandy loam
- 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Entic Haplorthods

- Oi—0 to 1 inch; slightly decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; light brownish gray sand
- Bs1—3 to 11 inches; brown sand
- Bs2—11 to 24 inches; strong brown sand
- BC—24 to 40 inches; yellowish brown sand
- C1—40 to 55 inches; yellowish brown sandy clay loam
- C2—55 to 180 inches; yellowish brown sand with bands of dark yellowish brown sandy loam and brown sandy clay loam

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Alfic Haplorthods—moderate; Entic Haplorthods—severe

Hazard of soil blowing: Moderate

Surface runoff class: Very low or low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Alfic Haplorthods—well drained; Entic Haplorthods—excessively drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: Rapid; or 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 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.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: None assigned

233D—Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, hilly

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy, and similar soils: 60 percent

Entic Haplorthods, sandy, fine-loamy banded substratum, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods

- Oe—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark grayish brown loamy sand
- E—4 to 7 inches; grayish brown sand
- Bs1—7 to 11 inches; brown sand
- Bs2—11 to 32 inches; strong brown sand
- Bw—32 to 37 inches; reddish yellow sand
- 2Bt—37 to 42 inches; brown sandy loam
- 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Entic Haplorthods

- Oi—0 to 1 inch; slightly decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; light brownish gray sand
- Bs1—3 to 11 inches; brown sand
- Bs2—11 to 24 inches; strong brown sand
- BC—24 to 40 inches; yellowish brown sand

C1—40 to 55 inches; yellowish brown sandy clay loam

C2—55 to 180 inches; yellowish brown sand with bands of dark yellowish brown sandy loam and brown sandy clay loam

Soil Properties and Qualities

Slope: 18 to 30 percent

Hazard of soil blowing: Alfic Haplorthods—moderate; Entic Haplorthods—severe

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Alfic Haplorthods—well drained; Entic Haplorthods—excessively drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: Rapid; or 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 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.

Interpretive Groups

Land capability classification: 6e

Michigan soil management group: None assigned

233E—Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, steep

Setting

Landform: Ground moraines and end moraines

Map Unit Composition

Alfic Haplorthods, sandy, and similar soils: 60 percent

Entic Haplorthods, sandy, fine-loamy banded substratum, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand
 Bs1—7 to 11 inches; brown sand
 Bs2—11 to 32 inches; strong brown sand
 Bw—32 to 37 inches; reddish, yellow sand
 2Bt—37 to 42 inches; brown sandy loam
 3C—42 to 180 inches; reddish yellow and brownish, yellow sand

Entic Haplorthods

Oi—0 to 1 inch; slightly decomposed plant material
 A—1 to 2 inches; black sand
 E—2 to 3 inches; light brownish gray sand
 Bs1—3 to 11 inches; brown sand
 Bs2—11 to 24 inches; strong brown sand
 BC—24 to 40 inches; yellowish brown sand
 C1—40 to 55 inches; yellowish brown sandy clay loam
 C2—55 to 180 inches; yellowish brown sand with bands of dark yellowish brown sandy loam and brown sandy clay loam

Soil Properties and Qualities

Slope: 30 to 45 percent

Hazard of soil blowing: Alfic Haplorthods—moderate; Entic Haplorthods—severe

Hazard of soil blowing: Moderate

Surface runoff class: Low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Alfic Haplorthods—well drained; Entic Haplorthods—excessively drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: Rapid; or 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: None assigned

234B—Lamellic Oxyaquic Haplorthods, sandy, nearly level and undulating

Setting

Landform: Lake terraces, outwash plains, and stream terraces

Map Unit Composition

Lamellic Oxyaquic Haplorthods, sandy, and similar soils: 100 percent

Typical Profile

Lamellic Oxyaquic Haplorthods

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 5 inches; black sand

E—5 to 7 inches; dark grayish brown sand

Bs1—7 to 10 inches; dark brown sand

Bs2—10 to 16 inches; strong brown sand

Bs3—16 to 27 inches; dark yellowish brown sand

BC—27 to 55 inches; brownish yellow, mottled sand

E and Bt1—55 to 63 inches; strong brown, mottled sand with bands of strong brown loamy sand

E and Bt2—63 to 84 inches; brown, mottled sand with bands of strong brown loamy sand

Soil Properties and Qualities

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: 2.0 feet (April and 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.

Interpretive Groups

Land capability classification: 5a

Michigan soil management group: None assigned

235B—Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, nearly level and undulating

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy over loamy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods, sandy over loamy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; black sand

E—4 to 6 inches; dark grayish brown sand

Bs1—6 to 9 inches; brown sand

Bs2—9 to 27 inches; strong brown sand

2Bt—27 to 44 inches; brown sandy clay loam

3C1—44 to 52 inches; yellowish brown loamy sand

3C2—52 to 120 inches; brownish yellow sand

Alfic Haplorthods, sandy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Alfic Haplorthods, sandy over loamy—severe; Alfic Haplorthods, sandy—moderate

Surface runoff class: Negligible or very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: 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.

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: None assigned

235C—Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy over loamy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods, sandy over loamy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; black sand

E—4 to 6 inches; dark grayish brown sand

Bs1—6 to 9 inches; brown sand

Bs2—9 to 27 inches; strong brown sand

2Bt—27 to 44 inches; brown sandy clay loam

3C1—44 to 52 inches; yellowish brown loamy sand

3C2—52 to 120 inches; brownish yellow sand

Alfic Haplorthods, sandy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand

2Bt—37 to 42 inches; brown sandy loam

3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Alfic Haplorthods, sandy over loamy—severe; Alfic Haplorthods, sandy—moderate

Surface runoff class: Very low or low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low to moderate

Shrink-swell potential: Low

Permeability: 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 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.

Interpretive Groups

Land capability classification: 4s

Michigan soil management group: None assigned

235D—Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, hilly

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy over loamy, and similar soils: 60 percent

Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods, sandy over loamy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; black sand

E—4 to 6 inches; dark grayish brown sand

Bs1—6 to 9 inches; brown sand

Bs2—9 to 27 inches; strong brown sand

2Bt—27 to 44 inches; brown sandy clay loam

3C1—44 to 52 inches; yellowish brown loamy sand

3C2—52 to 120 inches; brownish yellow sand

Alfic Haplorthods, sandy

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark grayish brown loamy sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 11 inches; brown sand

Bs2—11 to 32 inches; strong brown sand

Bw—32 to 37 inches; reddish yellow sand
 2Bt—37 to 42 inches; brown sandy loam
 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 18 to 30 percent
Hazard of soil blowing: Alfic Haplorthods, sandy over loamy—severe; Alfic Haplorthods, sandy—moderate
Surface runoff class: Low or medium
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Available water capacity: Low to moderate
Shrink-swell potential: Low
Permeability: 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 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.

Interpretive Groups

Land capability classification: 6e
Michigan soil management group: None assigned

235E—Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, steep

Setting

Landform: End moraines and ground moraines

Map Unit Composition

Alfic Haplorthods, sandy over loamy, and similar soils: 60 percent
 Alfic Haplorthods, sandy, and similar soils: 40 percent

Typical Profile

Alfic Haplorthods, sandy over loamy

Oe—0 to 2 inches; moderately decomposed plant material
 A—2 to 4 inches; black sand

E—4 to 6 inches; dark grayish brown sand
 Bs1—6 to 9 inches; brown sand
 Bs2—9 to 27 inches; strong brown sand
 2Bt—27 to 44 inches; brown sandy clay loam
 3C1—44 to 52 inches; yellowish brown loamy sand
 3C2—52 to 120 inches; brownish yellow sand

Alfic Haplorthods, sandy

Oe—0 to 2 inches; moderately decomposed plant material
 A—2 to 4 inches; very dark grayish brown loamy sand
 E—4 to 7 inches; grayish brown sand
 Bs1—7 to 11 inches; brown sand
 Bs2—11 to 32 inches; strong brown sand
 Bw—32 to 37 inches; reddish yellow sand
 2Bt—37 to 42 inches; brown sandy loam
 3C—42 to 180 inches; reddish yellow and brownish yellow sand

Soil Properties and Qualities

Slope: 30 to 45 percent

Hazard of soil blowing: Alfic Haplorthods, sandy over loamy—severe; Alfic Haplorthods, sandy—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 to moderate

Shrink-swell potential: Low

Permeability: 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: None assigned

236B—Arenic Hapludalfs, nearly level and undulating

Setting

Landform: Outwash plains, glacial drainage channels, and moraines

Map Unit Composition

Arenic Hapludalfs and similar soils: 100 percent

Typical Profile

Arenic Hapludalfs

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; very dark gray loamy sand

E—4 to 6 inches; light brownish gray sand

Bw1—6 to 12 inches; dark yellowish brown sand

Bw2—12 to 32 inches; yellowish brown loamy sand

2Bt1—32 to 37 inches; strong brown sandy loam

2Bt2—37 to 47 inches; brown sandy clay loam

3C1—47 to 72 inches; yellowish brown loamy sand

3C2—72 to 80 inches; light yellowish brown sand stratified with gravelly sand, fine sand, and loamy sand

Soil Properties and Qualities

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 to moderate

Shrink-swell potential: Low

Permeability: 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

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

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: None assigned

236C—Arenic Hapludalfs, rolling

Setting

Landform: Glacial drainage channels, moraines, and outwash plains

Map Unit Composition

Arenic Hapludalfs and similar soils: 100 percent

Typical Profile

Arenic Hapludalfs

- O_e—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark gray loamy sand
- E—4 to 6 inches; light brownish gray sand
- Bw₁—6 to 12 inches; dark yellowish brown sand
- Bw₂—12 to 32 inches; yellowish brown loamy sand
- 2Bt₁—32 to 37 inches; strong brown sandy loam
- 2Bt₂—37 to 47 inches; brown sandy clay loam
- 3C₁—47 to 72 inches; yellowish brown loamy sand
- 3C₂—72 to 80 inches; light yellowish brown sand stratified with gravelly sand, fine sand, and loamy sand

Soil Properties and Qualities

- Slope:* 6 to 18 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 to moderate
- Shrink-swell potential:* Low
- Permeability:* 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 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.

Interpretive Groups

- Land capability classification:* 4e
- Michigan soil management group:* None assigned

236D—Arenic Hapludalfs, hilly

Setting

Landform: Glacial drainage channels, moraines, and outwash plains

Map Unit Composition

Arenic Hapludalfs and similar soils: 100 percent

Typical Profile

Arenic Hapludalfs

- Oe—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark gray loamy sand
- E—4 to 6 inches; light brownish gray sand
- Bw1—6 to 12 inches; dark yellowish brown sand
- Bw2—12 to 32 inches; yellowish brown loamy sand
- 2Bt1—32 to 37 inches; strong brown sandy loam
- 2Bt2—37 to 47 inches; brown sandy clay loam
- 3C1—47 to 72 inches; yellowish brown loamy sand
- 3C2—72 to 80 inches; light yellowish brown sand stratified with gravelly sand, fine sand, and loamy sand

Soil Properties and Qualities

- Slope:* 18 to 30 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 to moderate
- Shrink-swell potential:* Low
- Permeability:* 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 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.

Interpretive Groups

- Land capability classification:* 6e
- Michigan soil management group:* None assigned

236E—Arenic Hapludalfs, steep

Setting

Landform: Glacial drainage channels, moraines, and outwash plains

Map Unit Composition

Arenic Hapludalfs and similar soils: 100 percent

Typical Profile

Arenic Hapludalfs

- Oe—0 to 2 inches; moderately decomposed plant material
- A—2 to 4 inches; very dark gray loamy sand
- E—4 to 6 inches; light brownish gray sand
- Bw1—6 to 12 inches; dark yellowish brown sand
- Bw2—12 to 32 inches; yellowish brown loamy sand
- 2Bt1—32 to 37 inches; strong brown sandy loam
- 2Bt2—37 to 47 inches; brown sandy clay loam
- 3C1—47 to 72 inches; yellowish brown loamy sand
- 3C2—72 to 80 inches; light yellowish brown sand stratified with gravelly sand, fine sand, and loamy sand

Soil Properties and Qualities

- Slope:* 30 to 45 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 to moderate
- Shrink-swell potential:* Low
- Permeability:* 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 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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.

Interpretive Groups

- Land capability classification:* 7e
- Michigan soil management group:* None assigned

237B—Glossudalfts, loamy, nearly level and undulating***Setting***

Landform: Moraines

Map Unit Composition

Glossudalfts, loamy, and similar soils: 100 percent

Typical Profile**Glossudalfts**

A—0 to 3 inches; very dark gray sandy loam

E/B—3 to 12 inches; brown loamy sand

B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam

BC—29 to 43 inches; brown loamy sand

C1—43 to 58 inches; reddish brown loamy sand

C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Soil Properties and Qualities

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

Flooding: None

Depth to seasonal high water table: More than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: None assigned

237C—Glossudalfts, loamy, rolling***Setting***

Landform: Moraines

Map Unit Composition

Glossudalfts, loamy, and similar soils: 100 percent

Typical Profile**Glossudalfts**

A—0 to 3 inches; very dark gray sandy loam

E/B—3 to 12 inches; brown loamy sand

B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam
 BC—29 to 43 inches; brown loamy sand
 C1—43 to 58 inches; reddish brown loamy sand
 C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Soil Properties and Qualities

Slope: 6 to 18 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
 • Onsite investigation is needed to determine the suitability for specific uses.

Interpretive Groups

Land capability classification: 4e
Michigan soil management group: None assigned

237D—Glossudalfs, loamy, hilly

Setting

Landform: Moraines

Map Unit Composition

Glossudalfs, loamy, and similar soils: 100 percent

Typical Profile

Glossudalfs

A—0 to 3 inches; very dark gray sandy loam
 E/B—3 to 12 inches; brown loamy sand
 B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam
 BC—29 to 43 inches; brown loamy sand
 C1—43 to 58 inches; reddish brown loamy sand
 C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Soil Properties and Qualities

Slope: 18 to 30 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
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 6e
Michigan soil management group: None assigned

237E—Glossudalfs, loamy, steep

Setting

Landform: Moraines

Map Unit Composition

Glossudalfs, loamy, and similar soils: 100 percent

Typical Profile

Glossudalfs

A—0 to 3 inches; very dark gray sandy loam
 E/B—3 to 12 inches; brown loamy sand
 B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam
 BC—29 to 43 inches; brown loamy sand
 C1—43 to 58 inches; reddish brown loamy sand
 C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Soil Properties and Qualities

Slope: 30 to 45 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
Flooding: None
Depth to seasonal high water table: More than 6.5 feet
Ponding: None

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 7e

Michigan soil management group: None assigned

247B—Glennie-Ossineke complex, nearly level and undulating

Setting

Landform: Ground moraines

Map Unit Composition

Glennie and similar soils: 60 percent

Ossineke and similar soils: 40 percent

Typical Profile

Glennie

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 3 inches; black loamy sand

E—3 to 7 inches; grayish brown loamy sand

Bt1—7 to 11 inches; dark brown sandy loam

Bt2—11 to 20 inches; strong brown loamy sand

E/Bx—20 to 40 inches; brown loamy sand and reddish brown loam

B/Ex—40 to 46 inches; reddish brown sandy clay loam and brown sandy loam

B't1—46 to 56 inches; dark reddish brown clay

B't2—56 to 80 inches; reddish brown, calcareous sandy clay loam

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: Glennie—low; Ossineke—high

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Low to moderate

Shrink-swell potential: Moderate or high

Permeability: Glennie—moderately rapid in the upper part and very slow in the lower part; Ossineke—slow

Flooding: None

Depth to seasonal high water table: Glennie—3.0 to 3.5 feet (January, February, March, April, May, November, December); Ossineke—1.5 to 3.0 feet (April and 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.

Interpretive Groups

Land capability classification: 2e

Michigan soil management group: Glennie—3/2a; Ossineke—3a

247C—Glennie-Ossineke complex, rolling***Setting***

Landform: Ground moraines

Map Unit Composition

Glennie and similar soils: 60 percent

Ossineke and similar soils: 40 percent

Typical Profile**Glennie**

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 3 inches; black loamy sand

E—3 to 7 inches; grayish brown loamy sand

Bt1—7 to 11 inches; dark brown sandy loam

Bt2—11 to 20 inches; strong brown loamy sand

E/Bx—20 to 40 inches; brown loamy sand and reddish brown loam

B/Ex—40 to 46 inches; reddish brown sandy clay loam and brown sandy loam

B't1—46 to 56 inches; dark reddish brown clay

B't2—56 to 80 inches; reddish brown, calcareous sandy clay loam

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Soil Properties and Qualities

Slope: 6 to 12 percent

Hazard of soil blowing: Moderate

Surface runoff class: Glennie—medium; Ossineke—very high

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Low to moderate

Shrink-swell potential: Moderate or high

Permeability: Glennie—moderately rapid in the upper part and very slow in the lower part; Ossineke—slow

Flooding: None

Depth to seasonal high water table: Glennie—3.0 to 3.5 feet (January, February, March, April, May, November, December); Ossineke—1.5 to 3.0 feet (April and May)

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.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: Glennie—3/2a; Ossineke—3a

250D—GlossudalFs-Haplosaprists, euic, complex, nearly level to hilly

Setting

Landform: Moraines

Map Unit Composition

GlossudalFs and similar soils: 60 percent

Haplosaprists, euic, and similar soils: 40 percent

Typical Profile

GlossudalFs

A—0 to 3 inches; very dark gray sandy loam

E/B—3 to 12 inches; brown loamy sand

B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam

BC—29 to 43 inches; brown loamy sand

C1—43 to 58 inches; reddish brown loamy sand

C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Haplosaprists, euic

Oe—0 to 13 inches; dark reddish brown mucky peat

Oa—13 to 25 inches; dark reddish brown muck

C—25 to 80 inches; dark grayish brown and yellowish brown sand

Soil Properties and Qualities

Slope: GlossudalFs—0 to 30 percent; Haplosaprists, euic—0 to 2 percent

Hazard of soil blowing: GlossudalFs—moderate; Haplosaprists, euic—slight

Surface runoff class: GlossudalFs—very high; Haplosaprists, euic—negligible

Potential for frost action: GlossudalFs—moderate; Haplosaprists, euic—high

Depth to restrictive feature: More than 80 inches

Drainage class: GlossudalFs—well drained; Haplosaprists, euic—very poorly drained

Available water capacity: GlossudalFs—moderate; Haplosaprists, euic—high

Shrink-swell potential: GlossudalFs—low; Haplosaprists, euic—not rated

Permeability: GlossudalFs—moderate; Haplosaprists, euic—moderately slow to moderately rapid

Flooding: None

Depth to seasonal high water table: GlossudalFs—more than 6.5 feet; Haplosaprists, euic—at the surface (January, February, March, April, May, June, September, October, November, December)

Months in which ponding does not occur: Haplosaprists, euic—June, July, August, September

Depth and most likely period of ponding: Haplosaprists, euic—0.5 foot (January, February, March, April, May, October, November, December); Glossudalfs—not ponded

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: None assigned

252A—Haplosaprists, euic-Au Gres complex, nearly level

Setting

Landform: Lake plains, outwash plains, and moraines

Map Unit Composition

Haplosaprists, euic, and similar soils: 60 percent

Au Gres and similar soils: 40 percent

Typical Profile

Haplosaprists, euic

Oe—0 to 13 inches; dark reddish brown mucky peat

Oa—13 to 25 inches; dark reddish brown muck

C—25 to 80 inches; dark grayish brown and yellowish brown sand

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Soil Properties and Qualities

Slope: Haplosaprists, euic—0 to 2 percent; Au Gres—0 to 3 percent

Hazard of soil blowing: Haplosaprists, euic—slight; Au Gres—severe

Surface runoff class: Negligible

Potential for frost action: Haplosaprists, euic—high; Au Gres—negligible

Depth to restrictive feature: More than 80 inches

Drainage class: Haplosaprists, euic—very poorly drained; Au Gres—somewhat poorly drained

Available water capacity: Haplosaprists, euic—high; Au Gres—low

Shrink-swell potential: Haplosaprists, euic—not rated; Au Gres—low

Permeability: Haplosaprists, euic—moderately slow to moderately rapid; Au Gres—rapid

Flooding: None

Depth to seasonal high water table: Haplosaprists, euic—at the surface (January, February, March, April, May, June, September, October, November, December); Au Gres—0.5 foot (April and May)

Months in which ponding does not occur: Haplosaprists, euic—June, July, August, September

Depth and most likely period of ponding: Haplosaprists, euic—0.5 foot (January, February, March, April, May, October, November, December); Au Gres—not ponded

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: Haplosaprists, euic—none assigned; Au Gres—5b

254A—Haplosaprists, euic-Fluvaquents-Aquic Udipsamments complex, nearly level, occasionally flooded

Setting

Landform: Lake plains, outwash plains, and moraines

Map Unit Composition

Haplosaprists, euic, and similar soils: 40 percent

Fluvaquents and similar soils: 35 percent

Aquic Udipsamments and similar soils: 25 percent

Typical Profile

Haplosaprists, euic

Oe—0 to 13 inches; dark reddish brown mucky peat

Oa—13 to 25 inches; dark reddish brown muck

C—25 to 80 inches; dark grayish brown and yellowish brown sand

Fluvaquents

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 6 inches; black muck

A—6 to 19 inches; dark yellowish brown, mottled loamy sand with thin layers of black mucky sand

C1—19 to 34 inches; dark yellowish brown, mottled gravelly loamy sand

C2—34 to 80 inches; yellowish brown sand

Aquic Udipsamments

A—0 to 6 inches; black sand

C1—6 to 22 inches; brown, mottled sand

C2—22 to 45 inches; yellowish brown, mottled sand

C3—45 to 80 inches; grayish brown, mottled sand

Soil Properties and Qualities

Slope: Haplosaprists, euic, and Fluvaquents—0 to 2 percent; Aquic Udipsamments—0 to 3 percent

Hazard of soil blowing: Haplosaprists, euic, and Fluvaquents—slight; Aquic Udipsamments—severe

Surface runoff class: Negligible

Potential for frost action: Haplosaprists, euic—high; Fluvaquents—not rated; Aquic Udipsamments—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Haplosaprists, euic, and Fluvaquents—very poorly drained; Aquic Udipsamments—somewhat poorly drained

Available water capacity: Haplosaprists, euic—high; Fluvaquents—not rated; Aquic Udipsamments—low

Shrink-swell potential: Haplosaprists, euic—not rated; Fluvaquents—not rated; Aquic Udipsamments—low

Permeability: Haplosaprists, euic—moderately slow to moderately rapid; Fluvaquents—not rated; Aquic Udipsamments—rapid

Frequency and most likely period of flooding: Haplosaprists, euic, and Fluvaquents—occasional (January, February, March, April, May, October, November, December); Aquic Udipsamments—occasional (April, May, October)

Depth to seasonal high water table: Haplosaprists, euic—at the surface (January, February, March, April, May, June, September, October, November, December); Fluvaquents—at the surface (January, February, March, April, May, October, November, December); Aquic Udipsamments—0.5 foot (April, May, October)

Months in which ponding does not occur: Haplosaprists, euic—June, July, August, September

Depth and most likely period of ponding: Haplosaprists, euic—0.5 foot (January, February, March, April, May, October, November, December); Fluvaquents—0.5 foot all year; Aquic Udipsamments—not ponded

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: None assigned

262A—Au Gres sand, nearly level

Setting

Landform: Outwash plains, stream terraces, and moraines

Map Unit Composition

Au Gres and similar soils: 100 percent

Typical Profile

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

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: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

Depth to seasonal high water table: 0.5 foot (April and 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 and by using such harvest methods as selective cutting and strip cutting.
- 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.

Interpretive Groups

Land capability classification: 4w

Michigan soil management group: 5b

264A—Allendale loamy sand, nearly level

Setting

Landform: Lake plains and outwash plains

Map Unit Composition

Allendale and similar soils: 100 percent

Typical Profile

Allendale

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 5 inches; very dark gray loamy sand

E—5 to 10 inches; light brownish gray, mottled sand

Bs1—10 to 17 inches; dark brown, mottled sand

Bs2—17 to 32 inches; dark yellowish brown, mottled sand

2Bt1—32 to 40 inches; reddish brown, mottled, calcareous clay

2Bt2—40 to 63 inches; brown, mottled, calcareous silty clay

2C—63 to 80 inches; dark grayish brown, mottled, calcareous silty clay

Soil Properties and Qualities

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: Low

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: 0.5 foot to 2.5 feet (April, May, November, December)

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 and by using such harvest methods as selective cutting and strip cutting.
- 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.

Interpretive Groups

Land capability classification: 3w

Michigan soil management group: 4/1b

265B—GlossudalFs-Allendale complex, nearly level and undulating***Setting***

Landform: Moraines

Map Unit Composition

GlossudalFs and similar soils: 60 percent

Allendale and similar soils: 40 percent

Typical Profile**GlossudalFs**

A—0 to 3 inches; very dark gray sandy loam

E/B—3 to 12 inches; brown loamy sand

B/E—12 to 29 inches; reddish brown sandy clay loam and brown sandy loam

BC—29 to 43 inches; brown loamy sand

C1—43 to 58 inches; reddish brown loamy sand

C2—58 to 84 inches; stratified reddish brown loamy sand and yellowish brown loam

Allendale

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 5 inches; very dark gray sand

E—5 to 10 inches; light brownish gray, mottled sand

Bs1—10 to 17 inches; dark brown, mottled sand

Bs2—17 to 32 inches; dark yellowish brown, mottled sand

2Bt1—32 to 40 inches; reddish brown, mottled, calcareous clay

2Bt2—40 to 63 inches; brown, mottled, calcareous silty clay

2C—63 to 80 inches; dark grayish brown, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: GlossudalFs—2 to 6 percent; Allendale—0 to 3 percent

Hazard of soil blowing: Moderate

Surface runoff class: GlossudalFs—low; Allendale—very low

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

Drainage class: GlossudalFs—well drained; Allendale—somewhat poorly drained

Available water capacity: GlossudalFs—moderate; Allendale—low

Shrink-swell potential: GlossudalFs—low; Allendale—high

Permeability: GlossudalFs—moderate; Allendale—rapid in the upper part and slow or very slow in the lower part

Flooding: None

Depth to seasonal high water table: Glossudalfs—more than 6.5 feet; Allendale—0.5 foot to 2.5 feet (April, May, November, December)

Ponding: None

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: Glossudalfs—none assigned; Allendale—4/1b

272—Endoaquods-Fluvaquents, occasionally flooded, complex

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Endoaquods and similar soils: 60 percent

Fluvaquents and similar soils: 40 percent

Typical Profile

Endoaquods

Oi—0 to 1 inch; slightly decomposed plant material

A—1 to 2 inches; black sand

E—2 to 8 inches; dark grayish brown sand

Bs1—8 to 13 inches; dark brown, mottled sand

Bs2—13 to 19 inches; dark yellowish brown, mottled sand

C—19 to 80 inches; yellowish brown and olive brown sand

Fluvaquents

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 6 inches; black muck

A—6 to 19 inches; dark yellowish brown, mottled loamy sand with thin layers of black mucky sand

C1—19 to 34 inches; dark yellowish brown, mottled gravelly loamy sand

C2—34 to 80 inches; yellowish brown sand

Soil Properties and Qualities

Slope: 0 to 2 percent

Hazard of soil blowing: Endoaquods—severe; Fluvaquents—slight

Surface runoff class: Negligible

Potential for frost action: Not rated

Depth to restrictive feature: More than 80 inches

Drainage class: Endoaquods—poorly drained; Fluvaquents—very poorly drained

Available water capacity: Endoaquods—low; Fluvaquents—not rated

Shrink-swell potential: Endoaquods—low; Fluvaquents—not rated

Permeability: Endoaquods—rapid; Fluvaquents—not rated

Frequency and most likely period of flooding: Endoaquods—none; Fluvaquents—occasional (January, February, March, April, November, December)

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

Months in which ponding does not occur: Endoaquods—June, July, August, September, October

Depth and most likely period of ponding: Endoaquods—0.5 foot (January, February, March, April, May, November, December); Fluvaquents—0.5 foot all year

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: None assigned

Michigan soil management group: None assigned

273—Leafriver-Wakeley complex

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Leafriver and similar soils: 60 percent

Wakeley and similar soils: 40 percent

Typical Profile

Leafriver

Oa—0 to 12 inches; black muck

C1—12 to 20 inches; dark yellowish brown sand

C2—20 to 40 inches; yellowish brown sand

C3—40 to 80 inches; light yellowish brown sand

Wakeley

Oa—0 to 7 inches; black muck

C—7 to 22 inches; light olive brown, mottled sand

2Cg1—22 to 29 inches; dark gray, mottled, calcareous clay

2Cg2—29 to 80 inches; gray, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: Leafriver—0 to 1 percent; Wakeley—0 to 2 percent

Hazard of soil blowing: Leafriver—moderate; Wakeley—moderate

Surface runoff class: Leafriver—negligible; Wakeley—very low

Potential for frost action: Leafriver—high; Wakeley—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Leafriver—very poorly drained; Wakeley—poorly drained

Available water capacity: Moderate

Shrink-swell potential: Leafriver—low; Wakeley—high

Permeability: Leafriver—moderate or moderately rapid in the organic material and rapid in the sandy material; Wakeley—rapid in the upper part and very slow in the lower part

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: Leafriver—5c; Wakeley—4/1c

274—Typic Endoaquods, wet

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Typic Endoaquods, wet, and similar soils: 100 percent

Typical Profile

Typic Endoaquods, wet

- O_i—0 to 1 inch; slightly decomposed plant material
- O_e—1 to 5 inches; black mucky peat
- E—5 to 11 inches; light brownish gray sand
- B_{s1}—11 to 15 inches; dark reddish brown, mottled sand
- B_{s2}—15 to 19 inches; strong brown sand
- C—19 to 80 inches; light yellowish brown, mottled sand

Soil Properties and Qualities

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: Very poorly drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Interpretive Groups

Land capability classification: 6w

Michigan soil management group: 5c-a

280—Aquents and Histosols, ponded

Setting

Landform: Depressions on moraines, lake plains, and outwash plains; flats

Map Unit Composition

Aquents and similar soils: 0 to 100 percent

Histosols and similar soils: 0 to 100 percent

Typical Profile

Aquents

AC—0 to 80 inches; variable

Histosols

Oa1—0 to 14 inches; black muck

Oa2—14 to 80 inches; black muck

Soil Properties and Qualities

Slope: 0 to 1 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: Not rated

Shrink-swell potential: Not rated

Permeability: Not rated

Flooding: None

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

Ponding depth: 0.5 foot all year

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: None assigned

281—Haplosaprists, dysic

Setting

Landform: Depressions

Map Unit Composition

Haplosaprists, dysic, and similar soils: 100 percent

Typical Profile

Haplosaprists, dysic

Oi1—0 to 2 inches; light olive brown peat

Oi2—2 to 8 inches; dark yellowish brown peat

Oa1—8 to 12 inches; reddish black muck

Oa2—12 to 36 inches; reddish black muck

Oa3—36 to 80 inches; reddish black muck

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: Very high

Shrink-swell potential: Not rated

Permeability: Moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, November, December)

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 7w

Michigan soil management group: None assigned

282—Haplosaprists, euic

Setting

Landform: Outwash plains, moraines, and lake plains

Map Unit Composition

Haplosaprists, euic, and similar soils: 100 percent

Typical Profile

Haplosaprists, euic

- Oe—0 to 13 inches; dark reddish brown mucky peat
- Oa—13 to 25 inches; dark reddish brown muck
- C—25 to 80 inches; dark grayish brown and yellowish brown sand

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: High

Shrink-swell potential: Not rated

Permeability: Moderately rapid

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: June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, November, December)

Use and Management

Land use: Dominant use—woodland

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

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: None assigned

307B—Klacking sand, 0 to 6 percent slopes

Setting

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Klacking and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Blue Lake soils in landscape positions similar to those of the Klacking soil
- The moderately well drained Croswell and Perecheny soils in landscape positions similar to or slightly lower than those of the Klacking soil

Typical Profile

Klacking

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

- E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand
 B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand
 C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

- 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 or 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; other uses—building site development, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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: 4a

307E—Klacking sand, 18 to 35 percent slopes***Setting***

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Klacking and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Blue Lake soils in landscape positions similar to those of the Klacking soil

Typical Profile**Klacking**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 to 35 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: Low

Shrink-swell potential: Low

Permeability: Rapid or 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 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 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.
- 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: 7e

Michigan soil management group: 4a

338B—Islandlake sand, 0 to 6 percent slopes***Setting***

Landform: Kames, outwash plains, and moraines

Map Unit Composition

Islandlake and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon and well drained Blue Lake soils in landscape positions similar to those of the Islandlake soil

Typical Profile**Islandlake**

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; brown sand

Bhs—7 to 10 inches; very dark brown sand

Bs1—10 to 18 inches; dark reddish brown sand

Bs2—18 to 27 inches; brown sand

E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Soil Properties and Qualities

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, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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

338E—Islandlake sand, 18 to 35 percent slopes

Setting

Landform: Moraines, kames, and outwash plains

Map Unit Composition

Islandlake and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon and well drained Blue Lake soils in landscape positions similar to those of the Islandlake soil

Typical Profile

Islandlake

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; brown sand

Bhs—7 to 10 inches; very dark brown sand

Bs1—10 to 18 inches; dark reddish brown sand

Bs2—18 to 27 inches; brown sand

E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Soil Properties and Qualities

Slope: 18 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 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 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.
- 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: 5a

352B—Deford-Au Gres-Croswell complex, 0 to 6 percent slopes***Setting***

Landform: Outwash plains and lake plains

Map Unit Composition

Deford and similar soils: 25 to 35 percent

Au Gres and similar soils: 25 to 30 percent

Croswell and similar soils: 20 to 30 percent

Contrasting inclusions: 5 to 20 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley and Kinross soils and the very poorly drained Tawas soils in landscape positions similar to those of the Deford soil
- The excessively drained Rubicon and Grayling soils in the higher landscape positions

Typical Profile**Deford**

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 4 inches; black muck

Bw—4 to 22 inches; light yellowish brown and light olive brown, mottled sand

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

Au Gres

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Croswell

A—0 to 2 inches; black sand

E—2 to 8 inches; brown sand

- Bs1—8 to 12 inches; dark brown sand
- Bs2—12 to 19 inches; strong brown sand
- BC—19 to 33 inches; light yellowish brown, mottled sand
- C—33 to 80 inches; brown and light brownish gray, mottled sand

Soil Properties and Qualities

- Slope:* Deford—0 to 2 percent; Au Gres—0 to 3 percent; Croswell—0 to 6 percent
- Hazard of soil blowing:* Deford—moderate; Au Gres and Croswell—severe
- Surface runoff class:* Negligible
- Potential for frost action:* Deford and Au Gres—moderate; Croswell—low
- Depth to restrictive feature:* More than 80 inches
- Drainage class:* Deford—poorly drained; Au Gres—somewhat poorly drained;
Croswell—moderately well drained
- Available water capacity:* Low
- Shrink-swell potential:* Low
- Permeability:* Rapid
- Flooding:* None
- Depth to seasonal high water table:* Deford—at the surface (January, February, March, April, May, September, October, November, December); Au Gres—0.5 foot (April and May); Croswell—2.0 feet (April and May)
- Months in which ponding does not occur:* Deford—June, July, August, September
- Depth and most likely period of ponding:* Deford—0.5 foot (January, February, March, April, May, October, November, December); Au Gres and Croswell—not ponded

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

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

Septic tank absorption fields

- Because of ponding, the Deford soil is generally unsuited to use as a site for septic tank absorption fields.
- The poor filtering capacity of the Au Gres and Croswell 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: 5w

Michigan soil management group: Deford—4c; Au Gres—5b; Croswell—5a

360—Wakeley muck

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Wakeley and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

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

Typical Profile

Wakeley

Oa—0 to 7 inches; black muck

C—7 to 22 inches; light olive brown, mottled sand

2Cg1—22 to 29 inches; dark gray, mottled, calcareous clay

2Cg2—29 to 80 inches; gray, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: 0 to 2 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: 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: At the surface (January, February, March, April, May, June, September, October, November, December)

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

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.

- 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 and seedling mortality, trees are generally not planted on this soil.

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, 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

362B—Millersburg loamy sand, 0 to 6 percent slopes

Setting

Landform: Ground moraines, end moraines, and disintegration moraines

Map Unit Composition

Millersburg and similar soils: 85 to 90 percent

Contrasting inclusions: 10 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Grayalm and Coppler soils in landscape positions similar to those of the Millersburg soil
- The well drained Klacking soils in landscape positions similar to those of the Millersburg soil
- The moderately well drained Morganlake and Perecheney soils in landscape positions similar to or slightly lower than those of the Millersburg soil
- The poorly drained Wakeley soils in the lower landscape positions

Typical Profile

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Soil Properties and Qualities

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 or 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; other uses—building site development, cropland, 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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- No major management 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

- 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: 3s

Michigan soil management group: 3a

362D—Millersburg loamy sand, 6 to 18 percent slopes

Setting

Landform: Disintegration moraines, ground moraines, and end moraines

Map Unit Composition

Millersburg and similar soils: 85 to 90 percent

Contrasting inclusions: 10 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and Coppler soils in landscape positions similar to those of the Millersburg soil
- The well drained Klacking and Menominee soils in landscape positions similar to those of the Millersburg soil
- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the Millersburg soil

Typical Profile

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 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 or moderately rapid

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—pasture, 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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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 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.
- 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: 3a

362E—Millersburg loamy sand, 18 to 35 percent slopes

Setting

Landform: Disintegration moraines, end moraines, and ground moraines

Map Unit Composition

Millersburg and similar soils: 85 to 90 percent

Contrasting inclusions: 10 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and Coppler soils in landscape positions similar to those of the Millersburg soil

- The well drained Klacking and Menominee soils in landscape positions similar to those of the Millersburg soil
- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the Millersburg soil

Typical Profile

Millersburg

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; brown sand
- Bw1—4 to 8 inches; strong brown loamy sand
- Bw2—8 to 12 inches; dark yellowish brown loamy sand
- E'—12 to 14 inches; brown loamy sand
- B/E—14 to 27 inches; yellowish red sandy loam and brown sand
- Bt—27 to 34 inches; reddish brown sandy loam
- BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand
- C—76 to 80 inches; brown loamy sand

Soil Properties and Qualities

- Slope:* 18 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 or moderately rapid
- 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 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.
- 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 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.
- 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: 7e

Michigan soil management group: 3a

368A—Au Gres-Deford complex, 0 to 3 percent slopes***Setting***

Landform: Outwash plains, moraines, and stream terraces

Map Unit Composition

Au Gres and similar soils: 60 to 70 percent

Deford and similar soils: 20 to 30 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Leafriver and Dawson soils in landscape positions similar to those of the Deford soil
- The moderately well drained Croswell soils in landscape positions slightly higher than those of the Au Gres soil

Typical Profile**Au Gres**

A—0 to 4 inches; very dark gray sand

E—4 to 10 inches; gray, mottled sand

Bhs—10 to 12 inches; dark reddish brown, mottled sand

Bs—12 to 16 inches; brown, mottled sand

BC—16 to 32 inches; yellowish brown, mottled sand

C—32 to 80 inches; light yellowish brown and light olive brown, mottled sand

Deford

Oe—0 to 1 inch; moderately decomposed plant material

Oa—1 to 4 inches; black muck

Bw—4 to 22 inches; light yellowish brown and light olive brown, mottled sand

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

Soil Properties and Qualities

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

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

Surface runoff class: Negligible

Potential for frost action: Moderate

Depth to restrictive feature: More than 80 inches

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

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid

Flooding: None

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

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

Depth and most likely period of ponding: Deford—0.5 foot (January, February, March, April, May, October, November, December); Au Gres—not ponded

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 on the Deford soil generally can be used only during the driest time of year.
- Because of wetness and seedling mortality, trees are generally not planted on the Deford 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.
- Because of ponding, the Deford soil is generally unsuited to building site development.

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

Interpretive Groups

Land capability classification: 4w

Michigan soil management group: Au Gres—5b; Deford—4c

369—Deford muck

Setting

Landform: Lake plains and outwash plains

Map Unit Composition

Deford and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

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

Typical Profile

Deford

- Oe—0 to 1 inch; moderately decomposed plant material
- Oa—1 to 4 inches; black muck
- Bw—4 to 22 inches; light yellowish brown and light olive brown, mottled sand
- C—22 to 80 inches; light olive brown and yellowish brown, mottled sand

Soil Properties and Qualities

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, May, September, October, November, December)

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

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, 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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on this soil.

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, 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: 4c

371—Springport silt loam

Setting

Landform: Lake plains

Map Unit Composition

Springport and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Tawas and poorly drained Wakeley and Deerheart soils in landscape positions similar to those of the Springport soil
- The somewhat poorly drained Algonquin and Allendale soils in the slightly higher landscape positions

Typical Profile

Springport

Ap1—0 to 4 inches; very dark gray silt loam

Ap2—4 to 9 inches; very dark gray, mottled silty clay loam

Eg—9 to 11 inches; dark gray, mottled silty clay

Bg—11 to 16 inches; greenish gray, mottled silty clay

Cg—16 to 48 inches; gray, mottled, calcareous silty clay loam

C—48 to 80 inches; brown, stratified, calcareous silt loam to silty clay loam

Soil Properties and Qualities

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: High

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

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

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

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, November, December)

Use and Management

Land use: Dominant use—woodland; other use—pasture

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.

- Adding lime and fertilizer according to the results of soil tests helps to ensure the maximum growth of plants.

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, 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: 1.5c

380—Access denied

- This map unit represents areas that were not mapped because the soil scientists were denied access. Onsite investigation is needed to determine soil properties and qualities and potential uses.

384B—losco sand, 0 to 6 percent slopes

Setting

Landform: Lake plains and ground moraines

Map Unit Composition

losco and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley soils in the slightly lower landscape positions
- The somewhat poorly drained Allendale soils in landscape positions similar to those of the losco soil
- The moderately well drained Morganlake soils in the slightly higher landscape positions

Typical Profile

losco

A—0 to 3 inches; black sand

E—3 to 12 inches; pinkish gray sand

Bhs—12 to 15 inches; dark reddish brown, mottled sand
 Bs—15 to 18 inches; strong brown, mottled sand
 E'—18 to 20 inches; pale brown loamy sand
 2B/E—20 to 30 inches; reddish brown, mottled sandy clay loam and yellowish brown, mottled loamy sand
 2Bt—30 to 42 inches; reddish brown, mottled sandy clay loam
 2C—42 to 80 inches; brown loam

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Severe

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: Low to moderate

Shrink-swell potential: Moderate

Permeability: Rapid in the upper part and moderate or moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: 0.5 foot (April and May)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.
- Subsurface drains can reduce the wetness if a suitable outlet is available.

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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- 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 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 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: 4/2b

388B—Millersburg-Klacking-Graycalm complex, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines, ground moraines, and end moraines

Map Unit Composition

Millersburg and similar soils: 35 to 40 percent

Klacking and similar soils: 25 to 30 percent

Graycalm and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and somewhat excessively drained Horsehead soils in landscape positions similar to those of the major soils
- The moderately well drained Perecheney, Croswell, and Morganlake soils in landscape positions similar to or slightly lower than those of the major soils
- The poorly drained Wakeley soils in the lower landscape positions

Typical Profile

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Klacking

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand
- E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand
- B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand
- C—41 to 80 inches; light yellowish brown sand

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 80 inches; brown sand and brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Millersburg—moderate; Klacking and Graycalm—severe

Surface runoff class: Millersburg—low; Klacking and Graycalm—negligible

Potential for frost action: Millersburg—moderate; Klacking and Graycalm—low

Depth to restrictive feature: More than 80 inches

Drainage class: Millersburg and Klacking—well drained; Graycalm—somewhat excessively drained

Available water capacity: Millersburg—moderate; Klacking and Graycalm—low

Shrink-swell potential: Low

Permeability: Millersburg—moderate or moderately rapid; Klacking—rapid or moderately rapid; Graycalm—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

- 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 the Millersburg soil.
- The poor filtering capacity of the Klacking and Graycalm 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: 3s

Michigan soil management group: Millersburg—3a; Klacking—4a; Graycalm—5a

388D—Millersburg-Klacking-Graycalm complex, 6 to 18 percent slopes

Setting

Landform: Disintegration moraines, ground moraines, and end moraines

Map Unit Composition

Millersburg and similar soils: 35 to 40 percent

Klacking and similar soils: 25 to 30 percent

Graycalm and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Horsehead, and well drained Menominee and Bamfield soils in landscape positions similar to those of the major soils
- The moderately well drained Perecheney and Croswell soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Millersburg—moderate; Klacking and Graycalm—severe

Surface runoff class: Millersburg—medium; Klacking—low; Graycalm—very low

Potential for frost action: Millersburg—moderate; Klacking and Graycalm—low

Depth to restrictive feature: More than 80 inches

Drainage class: Millersburg and Klacking—well drained; Graycalm—somewhat excessively drained

Available water capacity: Millersburg—moderate; Klacking and Graycalm—low

Shrink-swell potential: Low

Permeability: Millersburg—moderate or moderately rapid; Klacking—rapid or moderately rapid; Graycalm—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.

Building site development

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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.
- The poor filtering capacity of the Klacking and Graycalm 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: 4e

Michigan soil management group: Millersburg—3a; Klacking—4a; Graycalm—5a

388E—Millersburg-Klacking-Graycalm complex, 18 to 35 percent slopes

Setting

Landform: Disintegration moraines, end moraines, and ground moraines

Map Unit Composition

Millersburg and similar soils: 35 to 40 percent

Klacking and similar soils: 25 to 30 percent

Graycalm and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Horsehead, and well drained Menominee and Barnfield soils in landscape positions similar to those of the major soils
- The moderately well drained Perecheney and Croswell soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 18 to 35 percent

Hazard of soil blowing: Millersburg—moderate; Klacking and Graycalm—severe

Surface runoff class: Millersburg—high; Klacking—medium; Graycalm—low

Potential for frost action: Millersburg—moderate; Klacking and Graycalm—low

Depth to restrictive feature: More than 80 inches

Drainage class: Millersburg and Klacking—well drained; Graycalm—somewhat excessively drained

Available water capacity: Millersburg—moderate; Klacking and Graycalm—low

Shrink-swell potential: Low

Permeability: Millersburg—moderate or moderately rapid; Klacking—rapid or moderately rapid; Graycalm—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 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.
- 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, 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.
- 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.

- The poor filtering capacity of the Klacking and Graycalm 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: 7e

Michigan soil management group: Millersburg—3a; Klacking—4a; Graycalm—5a

390B—Horsehead-Graycalm sands, 0 to 6 percent slopes

Setting

Landform: Moraines, kames, glacial drainage channels, and outwash plains

Map Unit Composition

Horsehead and similar soils: 45 to 60 percent

Graycalm and similar soils: 30 to 40 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Tawas soils in the lower landscape positions
- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the major soils
- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; light yellowish brown, calcareous very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

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 or 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; other use—building site development

Woodland

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate.

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: 6s

Michigan soil management group: Horsehead—Ga; Graycalm—5a

390D—Horsehead-Graycalm sands, 6 to 18 percent slopes

Setting

Landform: Moraines, kames, glacial drainage channels, and outwash plains

Map Unit Composition

Horsehead and similar soils: 45 to 60 percent

Graycalm and similar soils: 30 to 40 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the major soils
- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

- 2Bt—23 to 36 inches; brown very gravelly loamy sand
- 2C1—36 to 47 inches; light yellowish brown, calcareous very gravelly sand
- 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

- Slope:* 6 to 18 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 or 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

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate.
- 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, these soils are poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 7s

Michigan soil management group: Horsehead—Ga; Graycalm—5a

390E—Horsehead-Graycalm sands, 18 to 35 percent slopes***Setting***

Landform: Outwash plains, glacial drainage channels, kames, and moraines

Map Unit Composition

Horsehead and similar soils: 45 to 60 percent

Graycalm and similar soils: 30 to 40 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the major soils
- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile**Horsehead**

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand and brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 18 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 or 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

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate.
- 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, 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.
- 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: 7s

Michigan soil management group: Horsehead—Ga; Graycalm—5a

390F—Horsehead-Graycalm sands, 35 to 70 percent slopes

Setting

Landform: Glacial drainage channels, kames, moraines, and outwash plains

Map Unit Composition

Horsehead and similar soils: 45 to 60 percent

Graycalm and similar soils: 30 to 40 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Perecheney soils in landscape positions similar to or slightly lower than those of the major soils
- The excessively drained Grayling and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; light yellowish brown, calcareous very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Soil Properties and Qualities

Slope: 35 to 70 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 or 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

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate.
- 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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 cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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.
- 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: 7s

Michigan soil management group: Horsehead—Ga; Graycalm—5a

391B—Horsehead sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains, moraines, kames, and glacial drainage channels

Map Unit Composition

Horsehead and similar soils: 100 percent

Typical Profile

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; light yellowish brown, calcareous very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

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 or 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

- Because loose sand can interfere with the traction of wheeled equipment, logging roads should be stabilized.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate.

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: Ga

393B—Morganlake loamy sand, 0 to 6 percent slopes

Setting

Landform: Till plains and moraines

Map Unit Composition

Morganlake and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm soils in landscape positions similar to or slightly higher than those of the Morganlake soil
- The moderately well drained Ossineke and Perechenee soils in landscape positions similar to those of the Morganlake soil

Typical Profile

Morganlake

A—0 to 2 inches; black loamy sand

E—2 to 5 inches; grayish brown sand

Bs—5 to 11 inches; brown sand

E'—11 to 21 inches; brown sand

2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand

2Bt—23 to 28 inches; brown, mottled sandy clay loam

2BC—28 to 33 inches; brown, mottled, calcareous sandy loam

2C—33 to 80 inches; brown, mottled, calcareous loam

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Low to moderate

Shrink-swell potential: Moderate

Permeability: Rapid in the upper part and moderate or moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, September, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland, 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.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- No major management 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 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: 3s

Michigan soil management group: 4/2a

393C—Morganlake loamy sand, 6 to 12 percent slopes

Setting

Landform: Till plains and moraines

Map Unit Composition

Morganlake and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm soils in landscape positions similar to or slightly higher than those of the Morganlake soil
- The moderately well drained Ossineke and Perecheney soils in landscape positions similar to those of the Morganlake soil

Typical Profile

Morganlake

A—0 to 2 inches; black loamy sand

E—2 to 5 inches; grayish brown sand

Bs—5 to 11 inches; brown sand

E'—11 to 21 inches; brown sand

2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand

2Bt—23 to 28 inches; brown, mottled sandy clay loam

2BC—28 to 33 inches; brown, mottled, calcareous sandy loam

2C—33 to 80 inches; brown, mottled, calcareous loam

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: Low to moderate

Shrink-swell potential: Moderate

Permeability: Rapid in the upper part and moderate or moderately slow in the lower part

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, September, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other use—pasture

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- No major management 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- 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: 4/2a

399D—Menominee-Bamfield, sandy substratum-Blue Lake complex, 12 to 18 percent slopes

Setting

Landform: Moraines and till plains

Map Unit Composition

Menominee and similar soils: 30 to 40 percent

Bamfield, sandy substratum, and similar soils: 20 to 30 percent

Blue Lake and similar soils: 15 to 20 percent

Contrasting inclusions: 10 to 20 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Lupton soils in the lower landscape positions
- The somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils

- The moderately well drained Morganlake soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Menominee

A—0 to 4 inches; very dark grayish brown sand
 E—4 to 7 inches; grayish brown sand
 Bs1—7 to 18 inches; brown sand
 Bs2—18 to 23 inches; dark yellowish brown sand
 2B/E—23 to 39 inches; brown clay loam and light brownish gray sandy loam
 2Bt—39 to 59 inches; reddish brown clay loam
 2C—59 to 80 inches; brown loam

Bamfield, sandy substratum

A—0 to 7 inches; very dark grayish brown fine sandy loam
 E—7 to 12 inches; brown loamy fine sand
 E/B—12 to 18 inches; brown loamy sand and reddish brown clay loam
 Bt1—18 to 26 inches; reddish brown and yellowish red clay loam
 Bt2—26 to 39 inches; reddish brown, calcareous loam
 BC—39 to 53 inches; reddish brown, calcareous loam
 C—53 to 79 inches; reddish brown, calcareous loam
 2C—79 to 80 inches; light yellowish brown, calcareous sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material
 E—5 to 8 inches; pinkish gray sand
 Bhs—8 to 13 inches; dark brown sand
 Bs—13 to 28 inches; brown and strong brown sand
 E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand
 E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 12 to 18 percent

Hazard of soil blowing: Menominee and Blue Lake—severe; Bamfield—moderate

Surface runoff class: Menominee—low; Bamfield—very high; Blue Lake—very low

Potential for frost action: Menominee and Blue Lake—low; Bamfield—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low to moderate

Shrink-swell potential: Menominee and Bamfield—moderate; Blue Lake—low

Permeability: Menominee—rapid in the upper part and moderate or moderately slow in the lower part; Bamfield—moderately slow in the loamy material and rapid in the sand; Blue Lake—rapid or 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; other use—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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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

- 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, these soils are poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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.
- The poor filtering capacity of the Blue Lake soil can result in the pollution of ground water.

Interpretive Groups

Land capability classification: 4e

Michigan soil management group: Menominee—4/2a; Bamfield—3/2a; Blue Lake—4a

400F—Menominee-Bamfield, sandy substratum-Blue Lake complex, 18 to 70 percent slopes, dissected

Setting

Landform: Till plains and moraines

Map Unit Composition

Menominee and similar soils: 30 to 40 percent

Bamfield, sandy substratum, and similar soils: 20 to 30 percent

Blue Lake and similar soils: 15 to 20 percent

Contrasting inclusions: 10 to 20 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Lupton soils in the lower landscape positions
- The somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils
- The moderately well drained Morganlake soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Menominee

A—0 to 4 inches; very dark grayish brown sand

E—4 to 7 inches; grayish brown sand

Bs1—7 to 18 inches; brown sand

Bs2—18 to 23 inches; dark yellowish brown sand

2B/E—23 to 39 inches; brown clay loam and light brownish gray sandy loam

2Bt—39 to 59 inches; reddish brown clay loam

2C—59 to 80 inches; brown loam

Bamfield, sandy substratum

A—0 to 7 inches; very dark grayish brown fine sandy loam

E—7 to 12 inches; brown loamy fine sand

E/B—12 to 18 inches; brown loamy sand and reddish brown clay loam

Bt1—18 to 26 inches; reddish brown and yellowish red clay loam

Bt2—26 to 39 inches; reddish brown, calcareous loam

BC—39 to 53 inches; reddish brown, calcareous loam

C—53 to 79 inches; reddish brown, calcareous loam

2C—79 to 80 inches; light yellowish brown, calcareous sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material

E—5 to 8 inches; pinkish gray sand

Bhs—8 to 13 inches; dark brown sand

Bs—13 to 28 inches; brown and strong brown sand

E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand

E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 18 to 70 percent

Hazard of soil blowing: Menominee and Blue Lake—severe; Bamfield—moderate

Surface runoff class: Menominee—medium; Bamfield—very high; Blue Lake—low

Potential for frost action: Menominee and Blue Lake—low; Bamfield—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Available water capacity: Low to moderate

Shrink-swell potential: Menominee and Bamfield—moderate; Blue Lake—low

Permeability: Menominee—rapid in the upper part and moderate or moderately slow in the lower part; Bamfield—moderately slow in the loamy material and rapid in the sand; Blue Lake—rapid or moderately rapid

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. 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 slope, ordinary crawler tractors and rubber-tired skidders cannot be operated safely in some areas. As a result, special logging methods, such as yarding the logs with a cable, may be needed.
- 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 cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- 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.
- 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: 7e

Michigan soil management group: Menominee—4/2a; Bamfield—3/2a; Blue Lake—4a

424B—Morganlake-Ossineke, sandy substratum-Blue Lake complex, 0 to 6 percent slopes

Setting

Landform: Till plains and moraines

Map Unit Composition

Morganlake and similar soils: 35 to 60 percent

Ossineke, sandy substratum, and similar soils: 20 to 30 percent

Blue Lake and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Coppler and moderately well drained Durkeelake and Perecheneys soils in landscape positions similar to those of the major soils
- The poorly drained Wakeley and very poorly drained Tawas soils in the lower landscape positions

Typical Profile

Morganlake

A—0 to 2 inches; black loamy sand
 E—2 to 5 inches; grayish brown sand
 Bs—5 to 11 inches; brown sand
 E'—11 to 21 inches; brown sand
 2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand
 2Bt—23 to 28 inches; brown, mottled sandy clay loam
 2BC—28 to 33 inches; brown, mottled, calcareous sandy loam
 2C—33 to 80 inches; brown, mottled, calcareous loam

Ossineke, sandy substratum

A—0 to 8 inches; very dark grayish brown fine sandy loam
 Bw—8 to 13 inches; brown sandy loam
 B/E—13 to 21 inches; dark reddish brown sandy clay loam and brown sandy loam
 Bt—21 to 38 inches; dark reddish brown sandy clay loam
 BC—38 to 51 inches; brown, calcareous sandy loam
 C—51 to 77 inches; brown, calcareous sandy loam
 2C—77 to 80 inches; yellowish brown, calcareous sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material
 E—5 to 8 inches; pinkish gray sand
 Bhs—8 to 13 inches; dark brown sand
 Bs—13 to 28 inches; brown and strong brown sand
 E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand
 E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Morganlake and Blue Lake—severe; Ossineke—moderate

Surface runoff class: Morganlake—very low; Ossineke—high; Blue Lake—negligible

Potential for frost action: Morganlake and Blue Lake—low; Ossineke—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Morganlake and Ossineke—moderately well drained; Blue Lake—well drained

Available water capacity: Morganlake and Blue Lake—low to moderate; Ossineke—high

Shrink-swell potential: Morganlake and Ossineke—moderate; Blue Lake—low

Permeability: Morganlake—rapid in the upper part and moderate or moderately slow in the lower part; Ossineke—moderate; Blue Lake—rapid or moderately rapid

Flooding: None

Depth to seasonal high water table: Morganlake—2.0 to 3.0 feet (March, April, May, September, October, November); Ossineke—1.5 to 3.0 feet (April and May); Blue Lake—more than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- In areas of the Blue Lake soil, 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.
- Backfilling the trenches with porous material helps to compensate for the restricted permeability.

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

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: Morganlake—4/2a; Ossineke—3a; Blue Lake—4a

424C—Morganlake-Ossineke, sandy substratum-Blue Lake complex, 6 to 12 percent slopes

Setting

Landform: Till plains and moraines

Map Unit Composition

Morganlake and similar soils: 35 to 60 percent

Ossineke, sandy substratum, and similar soils: 20 to 30 percent

Blue Lake and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Coppler and moderately well drained Durkeelake and Perecheney soils in landscape positions similar to those of the major soils
- The poorly drained Wakeley and very poorly drained Tawas soils in the lower landscape positions

Typical Profile

Morganlake

A—0 to 2 inches; black loamy sand

E—2 to 5 inches; grayish brown sand

Bs—5 to 11 inches; brown sand

E'—11 to 21 inches; brown sand

2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand

2Bt—23 to 28 inches; brown, mottled sandy clay loam

2BC—28 to 33 inches; brown, mottled, calcareous sandy loam

2C—33 to 80 inches; brown, mottled, calcareous loam

Ossineke, sandy substratum

A—0 to 8 inches; very dark grayish brown fine sandy loam

Bw—8 to 13 inches; brown sandy loam

B/E—13 to 21 inches; dark reddish brown sandy clay loam and brown sandy loam

Bt—21 to 38 inches; dark reddish brown sandy clay loam

BC—38 to 51 inches; brown, calcareous sandy loam

C—51 to 77 inches; brown, calcareous sandy loam

2C—77 to 80 inches; yellowish brown, calcareous sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material

E—5 to 8 inches; pinkish gray sand

Bhs—8 to 13 inches; dark brown sand

Bs—13 to 28 inches; brown and strong brown sand

E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand

E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 6 to 12 percent

Hazard of soil blowing: Morganlake and Blue Lake—severe; Ossineke—moderate

Surface runoff class: Morganlake—low; Ossineke—very high; Blue Lake—very low

Potential for frost action: Morganlake and Blue Lake—low; Ossineke—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Morganlake and Ossineke—moderately well drained; Blue Lake—well drained

Available water capacity: Morganlake and Blue Lake—low to moderate; Ossineke—high

Shrink-swell potential: Morganlake and Ossineke—moderate; Blue Lake—low

Permeability: Morganlake—rapid in the upper part and moderate or moderately slow in the lower part; Ossineke—moderate; Blue Lake—rapid or moderately rapid

Flooding: None

Depth to seasonal high water table: Morganlake—2.0 to 3.0 feet (March, April, May, September, October, November); Ossineke—1.5 to 3.0 feet (April and May); Blue Lake—more than 6.5 feet

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

Woodland

- In areas of the Blue Lake soil, 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- The poor filtering capacity of the Blue Lake soil can result in the pollution of ground water.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: Morganlake—4/2a; Ossineke—3a; Blue Lake—4a

426B—Coppler loamy sand, 0 to 6 percent slopes***Setting***

Landform: Glacial drainage channels, kames, moraines, and outwash plains

Map Unit Composition

Coppler and similar soils: 100 percent

Typical Profile**Coppler**

Oe—0 to 3 inches; moderately decomposed plant material

E—3 to 6 inches; brown sand

Bw1—6 to 14 inches; strong brown gravelly sand

Bw2—14 to 20 inches; strong brown gravelly sand

2Bt—20 to 26 inches; strong brown very gravelly sandy clay loam

3BC—26 to 31 inches; brownish yellow, calcareous very gravelly sand

3C1—31 to 50 inches; light yellowish brown, calcareous extremely gravelly sand

3C2—50 to 80 inches; stratified, calcareous, light yellowish brown sand and very gravelly sand

Soil Properties and Qualities

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: Moderately rapid to 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

- 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: 4a

441B—Morganlake-Nester complex, 0 to 6 percent slopes***Setting***

Landform: Till plains, outwash plains, moraines, and lake plains

Map Unit Composition

Morganlake and similar soils: 50 to 65 percent

Nester and similar soils: 35 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The well drained Klacking soils in landscape positions similar to those of the major soils
- The somewhat poorly drained losco soils in the slightly lower landscape positions
- The poorly drained Wakeley soils in the lower landscape positions

Typical Profile**Morganlake**

A—0 to 2 inches; black loamy sand

E—2 to 5 inches; grayish brown sand

Bs—5 to 11 inches; brown sand

E'—11 to 21 inches; brown sand

2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand

2Bt—23 to 28 inches; brown, mottled sandy clay loam

2BC—28 to 33 inches; brown, mottled, calcareous sandy loam

2C—33 to 80 inches; brown, mottled, calcareous loam

Nester

A—0 to 3 inches; black loam

E—3 to 6 inches; light brownish gray loam

E/B—6 to 16 inches; light brownish gray and reddish brown clay loam

Bt—16 to 34 inches; reddish brown, mottled clay

BC—34 to 41 inches; brown, mottled, calcareous clay loam

C—41 to 80 inches; brown, mottled, calcareous clay loam

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Morganlake—severe; Nester—moderate

Surface runoff class: Morganlake—very low; Nester—high

Potential for frost action: Morganlake—low; Nester—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Morganlake—low to moderate; Nester—moderate

Shrink-swell potential: Moderate

Permeability: Morganlake—rapid in the upper part and moderate or moderately slow in the lower part; Nester—slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, September, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—cropland, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- A cropping sequence that includes green manure crops, conservation tillage, and crop residue management increase the content of organic matter.
- 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.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- 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 the results of soil tests helps to ensure the maximum growth of plants.

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

- 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: 3s

Michigan soil management group: Morganlake—4/2a; Nester—1.5a

441C—Morganlake-Nester complex, 6 to 12 percent slopes

Setting

Landform: Moraines, outwash plains, till plains, and lake plains

Map Unit Composition

Morganlake and similar soils: 50 to 65 percent

Nester and similar soils: 35 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The well drained Klacking soils in landscape positions similar to those of the major soils
- The somewhat poorly drained losco soils in the slightly lower landscape positions
- The poorly drained Wakeley soils in the lower landscape positions

Typical Profile

Morganlake

A—0 to 2 inches; black loamy sand

E—2 to 5 inches; grayish brown sand

Bs—5 to 11 inches; brown sand

E'—11 to 21 inches; brown sand

2B/E—21 to 23 inches; brown, mottled sandy clay loam and sand

2Bt—23 to 28 inches; brown, mottled sandy clay loam

2BC—28 to 33 inches; brown, mottled, calcareous sandy loam

2C—33 to 80 inches; brown, mottled, calcareous loam

Nester

A—0 to 3 inches; black loam

E—3 to 6 inches; light brownish gray loam

E/B—6 to 16 inches; light brownish gray and reddish brown clay loam

Bt—16 to 34 inches; reddish brown, mottled clay

BC—34 to 41 inches; brown, mottled, calcareous clay loam

C—41 to 80 inches; brown, mottled, calcareous clay loam

Soil Properties and Qualities

Slope: 6 to 12 percent

Hazard of soil blowing: Morganlake—severe; Nester—moderate

Surface runoff class: Morganlake—low; Nester—very high

Potential for frost action: Morganlake—low; Nester—moderate

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Morganlake—low to moderate; Nester—moderate

Shrink-swell potential: Moderate

Permeability: Morganlake—rapid in the upper part and moderate or moderately slow in the lower part; Nester—slow

Flooding: None

Depth to seasonal high water table: 2.0 to 3.0 feet (March, April, May, September, October, November)

Ponding: None

Use and Management

Land use: Dominant use—woodland

Woodland

- No major management concerns affect the use of these soils 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.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- 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: Morganlake—4/2a; Nester—1.5a

452D—Bamfield fine sandy loam, sandy substratum, 12 to 18 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Bamfield, sandy substratum, and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Horsehead and well drained Blue Lake, Menominee, and Millersburg soils in landscape positions similar to those of the Bamfield soil

Typical Profile

Bamfield, sandy substratum

- A—0 to 7 inches; very dark grayish brown fine sandy loam
- E—7 to 12 inches; brown loamy fine sand
- E/B—12 to 18 inches; brown loamy sand and reddish brown clay loam
- Bt1—18 to 26 inches; reddish brown and yellowish red clay loam
- Bt2—26 to 39 inches; reddish brown, calcareous loam
- BC—39 to 53 inches; reddish brown, calcareous loam
- C—53 to 79 inches; reddish brown, calcareous loam
- 2C—79 to 80 inches; light yellowish brown, calcareous sand

Soil Properties and Qualities

Slope: 12 to 18 percent

Hazard of soil blowing: Moderate

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: Low

Shrink-swell potential: Moderate

Permeability: Moderately slow in the loamy material and rapid in the sandy material

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 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.
- 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: 3/2a

475B—Graycalm-Klacking sands, 0 to 6 percent slopes***Setting***

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 50 to 65 percent

Klacking and similar soils: 35 to 50 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and well drained Millersburg soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell and Perecheney soils in landscape positions similar to or slightly lower than those of the major soils
- The very poorly drained Dawson and poorly drained Kinross soils in the lower landscape positions

Typical Profile**Graycalm**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

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: Graycalm—somewhat excessively drained; Klacking—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Graycalm—rapid; Klacking—rapid or 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; other uses—building site development, pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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: 4s

Michigan soil management group: Graycalm—5a; Klacking—4a

475D—Graycalm-Klacking sands, 6 to 18 percent slopes

Setting

Landform: Outwash plains and moraines

Map Unit Composition

Graycalm and similar soils: 50 to 65 percent

Klacking and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell and Perecheney soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Graycalm

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw1—3 to 7 inches; dark yellowish brown sand

Bw2—7 to 17 inches; dark yellowish brown sand

Bw3—17 to 24 inches; yellowish brown sand

E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 6 to 18 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: Graycalm—somewhat excessively drained; Klacking—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Graycalm—rapid; Klacking—rapid or 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; other uses—building site development, pasture

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 the results of soil tests helps to ensure the maximum growth of plants.

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 6s

Michigan soil management group: Graycalm—5a; Klacking—4a

475E—Graycalm-Klacking sands, 18 to 35 percent slopes

Setting

Landform: Moraines and outwash plains

Map Unit Composition

Graycalm and similar soils: 50 to 65 percent

Klacking and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling and somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils
- The moderately well drained Perecheney soils in the lower landscape positions

Typical Profile

Graycalm

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw1—3 to 7 inches; dark yellowish brown sand
- Bw2—7 to 17 inches; dark yellowish brown sand
- Bw3—17 to 24 inches; yellowish brown sand
- E and Bt—24 to 80 inches; brown sand with bands of brown and strong brown loamy sand

Klacking

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black sand
- E—2 to 3 inches; grayish brown sand
- Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand
- E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand
- B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand
- C—41 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

Slope: 18 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: Graycalm—somewhat excessively drained; Klacking—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Graycalm—rapid; Klacking—rapid or 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 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, 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.
- 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: 7s

Michigan soil management group: Graycalm—5a; Klacking—4a

476B—Klacking-Perecheney sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains, kames, and moraines

Map Unit Composition

Klacking and similar soils: 50 to 65 percent

Perecheney and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell and Chinwhisker soils in landscape positions similar to or slightly lower than those of the major soils
- The somewhat poorly drained Au Gres soils in the lower landscape positions

Typical Profile

Klacking

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Perecheney

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; brown sand

Bw1—7 to 12 inches; dark yellowish brown sand

- Bw2—12 to 21 inches; brownish yellow sand
 E'—21 to 28 inches; light yellowish brown loamy sand
 2B/E—28 to 42 inches; brown loam, sandy clay loam, and sandy loam and light yellowish brown sand
 2BC—42 to 44 inches; mottled, calcareous, strong brown, brown, and brownish yellow loamy sand, sandy loam, very fine sandy loam, and sand
 3C—44 to 80 inches; light yellowish brown, calcareous sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Klacking—moderate; Perecheney—severe

Surface runoff class: Very low

Potential for frost action: Low

Depth to restrictive feature: More than 80 inches

Drainage class: Klacking—well drained; Perecheney—moderately well drained

Available water capacity: Klacking—low; Perecheney—moderate

Shrink-swell potential: Low

Permeability: Klacking—rapid or moderately rapid; Perecheney—rapid in the sandy material and moderately slow in the loamy material

Flooding: None

Depth to seasonal high water table: Klacking—more than 6.5 feet; Perecheney—2.5 to 6.0 feet (January, February, March, April, May, November, December)

Ponding: None

Use and Management

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

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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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

Interpretive Groups

Land capability classification: 3s

Michigan soil management group: Klacking—4a; Perecheney—4/2c

476D—Klacking-Perecheney sands, 6 to 18 percent slopes***Setting***

Landform: Outwash plains, kames, and moraines

Map Unit Composition

Klacking and similar soils: 50 to 65 percent

Perecheney and similar soils: 40 to 45 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Menominee soils in landscape positions similar to those of the major soils

Typical Profile**Klacking**

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

E—2 to 3 inches; grayish brown sand

Bw—3 to 21 inches; dark yellowish brown and yellowish brown sand

E and Bt—21 to 30 inches; light yellowish brown sand with bands of strong brown loamy sand

B/E—30 to 41 inches; strong brown sandy loam and light yellowish brown loamy sand

C—41 to 80 inches; light yellowish brown sand

Perecheney

Oa—0 to 2 inches; highly decomposed plant material

E—2 to 7 inches; brown sand

Bw1—7 to 12 inches; dark yellowish brown sand

Bw2—12 to 21 inches; brownish yellow sand

E'—21 to 28 inches; light yellowish brown loamy sand

2B/E—28 to 42 inches; brown loam, sandy clay loam, and sandy loam and light yellowish brown sand

- 2BC—42 to 44 inches; mottled, calcareous, strong brown, brown, and brownish yellow loamy sand, sandy loam, very fine sandy loam, and sand
 3C—44 to 80 inches; light yellowish brown, calcareous sand

Soil Properties and Qualities

- Slope:* Klacking—6 to 18 percent; Perecheney—6 to 12 percent
Hazard of soil blowing: Klacking—moderate; Perecheney—severe
Surface runoff class: Klacking—low; Perecheney—very low
Potential for frost action: Low
Depth to restrictive feature: More than 80 inches
Drainage class: Klacking—well drained; Perecheney—moderately well drained
Available water capacity: Klacking—low; Perecheney—moderate
Shrink-swell potential: Low
Permeability: Klacking—rapid or moderately rapid; Perecheney—rapid in the sandy material and moderately slow in the loamy material
Flooding: None
Depth to seasonal high water table: Klacking—more than 6.5 feet; Perecheney—2.5 to 6.0 feet (January, February, March, April, May, November, December)
Ponding: None

Use and Management

Land use: Dominant use—woodland; other uses—pasture, 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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 4e

Michigan soil management group: Klacking—4a; Perecheney—4/2c

488A—Allendale sand, 0 to 3 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Allendale and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The somewhat poorly drained Algonquin soils in landscape positions similar to those of the Allendale soil
- The poorly drained Wakeley soils in the slightly lower landscape positions

Typical Profile

Allendale

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 5 inches; very dark gray sand

E—5 to 10 inches; light brownish gray, mottled sand

Bs1—10 to 17 inches; dark brown, mottled sand

Bs2—17 to 32 inches; dark yellowish brown, mottled sand

2Bt1—32 to 40 inches; reddish brown, mottled, calcareous clay

2Bt2—40 to 63 inches; brown, mottled, calcareous silty clay

2C—63 to 80 inches; dark grayish brown, mottled, calcareous silty clay

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Severe

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: Low to 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: 0.5 foot to 2.5 feet (April, May, November, December)

Ponding: None

Use and Management

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

Cropland

- Conservation tillage, windbreaks, crop residue management, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps to control soil blowing.
- Conservation tillage and additions of organic material increase the content of organic matter and the available water capacity.
- Subsurface drains can reduce the wetness if a suitable outlet is available.
- Because of the restricted permeability, subsurface drains should be narrowly spaced.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.

Pasture

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

Woodland

- 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 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

496B—Gerrish-Grayling sands, 0 to 6 percent slopes

Setting

Landform: Outwash plains

Map Unit Composition

Gerrish and similar soils: 50 to 70 percent

Grayling and similar soils: 20 to 50 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

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

Typical Profile

Gerrish

Oe—0 to 2 inches; moderately decomposed plant material

A—2 to 4 inches; dark brown sand

Bw1—4 to 10 inches; strong brown sand

Bw2—10 to 21 inches; strong brown gravelly sand

E and Bt—21 to 60 inches; light yellowish brown sand with bands of strong brown loamy sand

C—60 to 80 inches; light yellowish brown, calcareous sand

Grayling

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black sand

Bw1—2 to 7 inches; brown sand

Bw2—7 to 15 inches; dark yellowish brown sand

BC—15 to 23 inches; yellowish brown sand

C—23 to 80 inches; light yellowish brown sand

Soil Properties and Qualities

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: Gerrish—somewhat excessively drained; Grayling—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 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: 4s

Michigan soil management group: Gerrish—5a; Grayling—5.7a

503D—Bamfield, sandy substratum-Millersburg-Horsehead complex, 6 to 18 percent slopes

Setting

Landform: Ground moraines and disintegration moraines

Map Unit Composition

Bamfield, sandy substratum, and similar soils: 30 to 35 percent

Millersburg and similar soils: 25 to 30 percent

Horsehead and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deerheart and very poorly drained Lupton soils in the lower landscape positions
- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Ossineke and Morganlake soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Bamfield, sandy substratum

A—0 to 7 inches; very dark grayish brown fine sandy loam

E—7 to 12 inches; brown loamy fine sand

E/B—12 to 18 inches; brown loamy sand and reddish brown clay loam

Bt1—18 to 26 inches; reddish brown and yellowish red clay loam

Bt2—26 to 39 inches; reddish brown, calcareous loam

BC—39 to 53 inches; reddish brown, calcareous loam

C—53 to 79 inches; reddish brown, calcareous loam

2C—79 to 80 inches; light yellowish brown, calcareous sand

Millersburg

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; brown sand
- Bw1—4 to 8 inches; strong brown loamy sand
- Bw2—8 to 12 inches; dark yellowish brown loamy sand
- E'—12 to 14 inches; brown loamy sand
- B/E—14 to 27 inches; yellowish red sandy loam and brown sand
- Bt—27 to 34 inches; reddish brown sandy loam
- BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand
- C—76 to 80 inches; brown loamy sand

Horsehead

- A—0 to 3 inches; black sand
- Bw1—3 to 11 inches; strong brown gravelly sand
- Bw2—11 to 23 inches; brown sand
- 2Bt—23 to 36 inches; brown very gravelly loamy sand
- 2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand
- 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

Slope: 6 to 18 percent

Hazard of soil blowing: Bamfield and Millersburg—moderate; Horsehead—severe

Surface runoff class: Bamfield—very high; Millersburg—medium; Horsehead—very low

Potential for frost action: Bamfield and Millersburg—moderate; Horsehead—low

Depth to restrictive feature: More than 80 inches

Drainage class: Bamfield and Millersburg—well drained; Horsehead—somewhat excessively drained

Available water capacity: Bamfield—moderate; Millersburg—low to moderate; Horsehead—low

Shrink-swell potential: Bamfield and Millersburg—moderate; Horsehead—low

Permeability: Bamfield—moderately slow in the loamy material and rapid in the sand; Millersburg—moderate or moderately rapid; Horsehead—rapid or 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

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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.
- 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: Bamfield—3/2a; Millersburg—3a; Horsehead—Ga

503E—Bamfield, sandy substratum-Millersburg-Horsehead complex, 18 to 35 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Bamfield, sandy substratum, and similar soils: 30 to 35 percent

Millersburg and similar soils: 25 to 30 percent

Horsehead and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deerheart and very poorly drained Lupton soils in the lower landscape positions
- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Ossineke and Morganlake soils in landscape position similar to or slightly lower than those of the major soils

Typical Profile**Bamfield, sandy substratum**

A—0 to 7 inches; very dark grayish brown fine sandy loam

E—7 to 12 inches; brown loamy fine sand

E/B—12 to 18 inches; brown loamy sand and reddish brown clay loam

Bt1—18 to 26 inches; reddish brown and yellowish red clay loam

Bt2—26 to 39 inches; reddish brown, calcareous loam

BC—39 to 53 inches; reddish brown, calcareous loam

C—53 to 79 inches; reddish brown, calcareous loam

2C—79 to 80 inches; light yellowish brown, calcareous sand

Millersburg

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; brown sand
- Bw1—4 to 8 inches; strong brown loamy sand
- Bw2—8 to 12 inches; dark yellowish brown loamy sand
- E'—12 to 14 inches; brown loamy sand
- B/E—14 to 27 inches; yellowish red sandy loam and brown sand
- Bt—27 to 34 inches; reddish brown sandy loam
- BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand
- C—76 to 80 inches; brown loamy sand

Horsehead

- A—0 to 3 inches; black sand
- Bw1—3 to 11 inches; strong brown gravelly sand
- Bw2—11 to 23 inches; brown sand
- 2Bt—23 to 36 inches; brown very gravelly loamy sand
- 2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand
- 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

Slope: 18 to 35 percent

Hazard of soil blowing: Bamfield and Millersburg—moderate; Horsehead—severe

Surface runoff class: Bamfield—very high; Millersburg—high; Horsehead—low

Potential for frost action: Bamfield and Millersburg—moderate; Horsehead—low

Depth to restrictive feature: More than 80 inches

Drainage class: Bamfield and Millersburg—well drained; Horsehead—somewhat excessively drained

Available water capacity: Bamfield—moderate; Millersburg—low to moderate; Horsehead—low

Shrink-swell potential: Bamfield and Millersburg—moderate; Horsehead—low

Permeability: Bamfield—moderately slow in the loamy material and rapid in the sand; Millersburg—moderate or moderately rapid; Horsehead—rapid or 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

- 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.
- 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, 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.
- 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.
- 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: 6e

Michigan soil management group: Bamfield—3/2a; Millersburg—3a; Horsehead—Ga

504B—Coppler-Horsehead sands, 0 to 6 percent slopes

Setting

Landform: Moraines, outwash plains, glacial drainage channels, and kames

Map Unit Composition

Coppler and similar soils: 40 to 50 percent

Horsehead and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Graycalm, and well drained Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Croswell soils in landscape positions similar to or slightly lower than those of the major soils

Typical Profile

Coppler

Oe—0 to 3 inches; moderately decomposed plant material

E—3 to 6 inches; brown sand

Bw1—6 to 14 inches; strong brown gravelly sand

Bw2—14 to 20 inches; strong brown gravelly sand

2Bt—20 to 26 inches; strong brown very gravelly sandy clay loam

3BC—26 to 31 inches; brownish yellow, calcareous very gravelly sand

3C1—31 to 50 inches; light yellowish brown, calcareous extremely gravelly sand

3C2—50 to 80 inches; stratified, calcareous, light yellowish brown sand and very gravelly sand

Horsehead

- A—0 to 3 inches; black sand
- Bw1—3 to 11 inches; strong brown gravelly sand
- Bw2—11 to 23 inches; brown sand
- 2Bt—23 to 36 inches; brown very gravelly loamy sand
- 2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand
- 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

- 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:* Moderately rapid to 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; other uses—building site development, pasture, 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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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: 3s

Michigan soil management group: Coppler—4a; Horsehead—Ga

504D—Coppler-Horsehead sands, 6 to 18 percent slopes

Setting

Landform: Glacial drainage channels, outwash plains, kames, and moraines

Map Unit Composition

Coppler and similar soils: 40 to 50 percent

Horsehead and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Graycalm, and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Coppler

Oe—0 to 3 inches; moderately decomposed plant material

E—3 to 6 inches; brown sand

Bw1—6 to 14 inches; strong brown gravelly sand

Bw2—14 to 20 inches; strong brown gravelly sand

2Bt—20 to 26 inches; strong brown very gravelly sandy clay loam

3BC—26 to 31 inches; brownish yellow, calcareous very gravelly sand

3C1—31 to 50 inches; light yellowish brown, calcareous extremely gravelly sand

3C2—50 to 80 inches; stratified, calcareous, light yellowish brown sand and very gravelly sand

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

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: Somewhat excessively drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Moderately rapid to 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; other uses—pasture, 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.

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 the results of soil tests helps to ensure the maximum growth of plants.

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

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 4e

Michigan soil management group: Coppler—4a; Horsehead—Ga

504E—Coppler-Horsehead sands, 18 to 35 percent slopes

Setting

Landform: Glacial drainage channels, outwash plains, kames, and moraines

Map Unit Composition

Coppler and similar soils: 40 to 50 percent
 Horsehead and similar soils: 35 to 45 percent
 Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The excessively drained Grayling, somewhat excessively drained Graycalm, and well drained Klacking soils in landscape positions similar to those of the major soils

Typical Profile

Coppler

Oe—0 to 3 inches; moderately decomposed plant material
 E—3 to 6 inches; brown sand
 Bw1—6 to 14 inches; strong brown gravelly sand
 Bw2—14 to 20 inches; strong brown gravelly sand
 2Bt—20 to 26 inches; strong brown very gravelly sandy clay loam
 3BC—26 to 31 inches; brownish yellow, calcareous very gravelly sand
 3C1—31 to 50 inches; light yellowish brown, calcareous extremely gravelly sand
 3C2—50 to 80 inches; stratified, calcareous, light yellowish brown sand and very gravelly sand

Horsehead

A—0 to 3 inches; black sand
 Bw1—3 to 11 inches; strong brown gravelly sand
 Bw2—11 to 23 inches; brown sand
 2Bt—23 to 36 inches; brown very gravelly loamy sand
 2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand
 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

Slope: 0 to 6 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: Moderately rapid to 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

- 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, 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.
- 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: 6e

Michigan soil management group: Coppler—4a; Horsehead—Ga

505B—Ossineke-Millersburg-Horsehead complex, 0 to 6 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Ossineke and similar soils: 30 to 40 percent

Millersburg and similar soils: 25 to 30 percent

Horsehead and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Blue Lake and Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Morganlake soils in landscape positions similar to or slightly lower than those of the major soils
- The poorly drained Deerheart and very poorly drained Lupton soils in the lower landscape positions

Typical Profile

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Millersburg

- Oe—0 to 1 inch; moderately decomposed plant material
- A—1 to 2 inches; black loamy sand
- E—2 to 4 inches; brown sand
- Bw1—4 to 8 inches; strong brown loamy sand
- Bw2—8 to 12 inches; dark yellowish brown loamy sand
- E'—12 to 14 inches; brown loamy sand
- B/E—14 to 27 inches; yellowish red sandy loam and brown sand
- Bt—27 to 34 inches; reddish brown sandy loam
- BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand
- C—76 to 80 inches; brown loamy sand

Horsehead

- A—0 to 3 inches; black sand
- Bw1—3 to 11 inches; strong brown gravelly sand
- Bw2—11 to 23 inches; brown sand
- 2Bt—23 to 36 inches; brown very gravelly loamy sand
- 2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand
- 2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Ossineke and Millersburg—moderate; Horsehead—severe

Surface runoff class: Ossineke—high; Millersburg—medium; Horsehead—negligible

Potential for frost action: Ossineke and Millersburg—moderate; Horsehead—low

Depth to restrictive feature: More than 80 inches

Drainage class: Ossineke—moderately well drained; Millersburg—well drained;

Horsehead—somewhat excessively drained

Available water capacity: Ossineke and Millersburg—moderate; Horsehead—low

Shrink-swell potential: Ossineke—moderate; Millersburg and Horsehead—low

Permeability: Ossineke—slow; Millersburg—moderate or moderately rapid;

Horsehead—rapid or very rapid

Flooding: None

Depth to seasonal high water table: Ossineke—1.5 to 3.0 feet (April and May);

Millersburg and Horsehead—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.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate in areas of the Horsehead soil.

Building site development

- 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 some areas, trench walls should be reinforced.

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

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: Ossineke—3a; Millersburg—3a; Horsehead—Ga

505C—Ossineke-Millersburg-Horsehead complex, 6 to 12 percent slopes

Setting

Landform: Disintegration moraines and ground moraines

Map Unit Composition

Ossineke and similar soils: 30 to 40 percent

Millersburg and similar soils: 25 to 30 percent

Horsehead and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Blue Lake and Klacking soils in landscape positions similar to those of the major soils
- The moderately well drained Morganlake soils in landscape positions similar to or slightly lower than those of the major soils
- The poorly drained Deerheart and very poorly drained Lupton soils in the lower landscape positions

Typical Profile

Ossineke

Ap—0 to 9 inches; very dark brown fine sandy loam

B/E—9 to 16 inches; brown clay loam and light brownish gray loamy fine sand

Bt1—16 to 20 inches; dark yellowish brown, mottled clay loam

Bt2—20 to 29 inches; yellowish brown, mottled clay loam

C1—29 to 50 inches; light brown, mottled, calcareous loam

C2—50 to 80 inches; brown, mottled, calcareous sandy loam

Millersburg

Oe—0 to 1 inch; moderately decomposed plant material

A—1 to 2 inches; black loamy sand

E—2 to 4 inches; brown sand

Bw1—4 to 8 inches; strong brown loamy sand

Bw2—8 to 12 inches; dark yellowish brown loamy sand

E'—12 to 14 inches; brown loamy sand

B/E—14 to 27 inches; yellowish red sandy loam and brown sand

Bt—27 to 34 inches; reddish brown sandy loam

BC—34 to 76 inches; yellowish red sandy loam and strong brown loamy sand

C—76 to 80 inches; brown loamy sand

Horsehead

A—0 to 3 inches; black sand

Bw1—3 to 11 inches; strong brown gravelly sand

Bw2—11 to 23 inches; brown sand

2Bt—23 to 36 inches; brown very gravelly loamy sand

2C1—36 to 47 inches; calcareous, light yellowish brown very gravelly sand

2C2—47 to 80 inches; stratified, calcareous, light yellowish brown sand, very gravelly coarse sand, and very gravelly sand

Soil Properties and Qualities

Slope: 6 to 12 percent

Hazard of soil blowing: Ossineke and Millersburg—moderate; Horsehead—severe

Surface runoff class: Ossineke—very high; Millersburg—high; Horsehead—very low

Potential for frost action: Ossineke and Millersburg—moderate; Horsehead—low

Depth to restrictive feature: More than 80 inches

Drainage class: Ossineke—moderately well drained; Millersburg—well drained; Horsehead—somewhat excessively drained

Available water capacity: Ossineke and Millersburg—moderate; Horsehead—low

Shrink-swell potential: Ossineke—moderate; Millersburg and Horsehead—low

Permeability: Ossineke—slow; Millersburg—moderate or moderately rapid;

Horsehead—rapid or very rapid

Flooding: None

Depth to seasonal high water table: Ossineke—1.5 to 3.0 feet (April and May);

Millersburg and Horsehead—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.
- Planting special nursery stock or containerized seedlings can reduce the seedling mortality rate in areas of the Horsehead soil.

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.
- 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 some areas, trench walls should be reinforced.

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.
- Filling or mounding with suitable material helps to raise the absorption field above the water table.
- The poor filtering capacity of the Horsehead soil can result in the pollution of ground water.

Interpretive Groups

Land capability classification: 3e

Michigan soil management group: Ossineke—3a; Millersburg—3a; Horsehead—Ga

506B—Durkeelake sand, 0 to 6 percent slopes

Setting

Landform: Outwash plains and lake plains

Map Unit Composition

Durkeelake and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to or slightly higher than those of the Durkeelake soil
- The moderately well drained Morganlake, Ossineke, Negwegon, Kellogg, and Perecheneys soils in landscape positions similar to those of the Durkeelake soil
- The very poorly drained Tawas soils in the lower landscape positions

Typical Profile

Durkeelake

Oa—0 to 3 inches; highly decomposed plant material

E—3 to 9 inches; pinkish gray sand

Bw1—9 to 13 inches; strong brown sand

Bw2—13 to 25 inches; strong brown sand

2B/E—25 to 31 inches; mottled, brown silty clay loam and light brownish gray loamy fine sand

2BC—31 to 33 inches; yellowish brown, mottled silt loam

2C—33 to 80 inches; stratified, mottled, calcareous, light olive brown silt loam and silty clay loam and yellowish brown very fine sandy loam

Soil Properties and Qualities

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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Rapid in the sandy material and moderate or moderately slow in the loamy material

Flooding: None

Depth to seasonal high water table: 2.0 to 3.5 feet (January, February, March, April, May, November, December)

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.
- 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: 4s

Michigan soil management group: 4/2a

506C—Durkeelake sand, 6 to 12 percent slopes***Setting***

Landform: Lake plains and outwash plains

Map Unit Composition

Durkeelake and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Minor Components

Contrasting inclusions:

- The somewhat excessively drained Graycalm and well drained Klacking soils in landscape positions similar to or slightly higher than those of the Durkeelake soil
- The moderately well drained Morganlake, Ossineke, Negwegon, Kellogg, and Perecheney soils in landscape positions similar to those of the Durkeelake soil
- The very poorly drained Tawas soils in the lower landscape positions

Typical Profile**Durkeelake**

Oa—0 to 3 inches; highly decomposed plant material

E—3 to 9 inches; pinkish gray sand

Bw1—9 to 13 inches; strong brown sand

Bw2—13 to 25 inches; strong brown sand

2B/E—25 to 31 inches; mottled, brown silty clay loam and light brownish gray loamy fine sand

2BC—31 to 33 inches; yellowish brown, mottled silt loam

2C—33 to 80 inches; stratified, mottled, calcareous, light olive brown silt loam and silty clay loam and yellowish brown very fine sandy loam

Soil Properties and Qualities

Slope: 6 to 12 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: Moderately well drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Rapid in the sandy material and moderate or moderately slow in the loamy material

Flooding: None

Depth to seasonal high water table: 2.0 to 3.5 feet (January, February, March, April, May, November, December)

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

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 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: 4s

Michigan soil management group: 4/2a

507D—Islandlake sand, 6 to 18 percent slopes

Setting

Landform: Kames, outwash plains, and moraines

Map Unit Composition

Islandlake and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon, somewhat excessively drained Coppler, and well drained Blue Lake soils in landscape positions similar to those of the Islandlake soil

Typical Profile

Islandlake

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; brown sand

Bhs—7 to 10 inches; very dark brown sand

Bs1—10 to 18 inches; dark reddish brown sand

Bs2—18 to 27 inches; brown sand

E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Soil Properties and Qualities

Slope: 12 to 18 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 uses—cropland, pasture, building site development

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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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 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: 6s

Michigan soil management group: 5a

508B—Islandlake-Blue Lake sands, 0 to 6 percent slopes***Setting***

Landform: Kames, outwash plains, and moraines

Map Unit Composition

Islandlake and similar soils: 45 to 65 percent

Blue Lake and similar soils: 35 to 45 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon and somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils

Typical Profile

Islandlake

Oe—0 to 2 inches; moderately decomposed plant material
 E—2 to 7 inches; brown sand
 Bhs—7 to 10 inches; very dark brown sand
 Bs1—10 to 18 inches; dark reddish brown sand
 Bs2—18 to 27 inches; brown sand
 E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material
 E—5 to 8 inches; pinkish gray sand
 Bhs—8 to 13 inches; dark brown sand
 Bs—13 to 28 inches; brown and strong brown sand
 E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand
 E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

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: Islandlake—somewhat excessively drained; Blue Lake—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid or 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; other uses—cropland, pasture, building site development

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, stripcropping, vegetative barriers, cover crops, and crop rotations that include small grain and hay help to control soil blowing. A permanent plant cover also helps 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 the results of soil tests helps to ensure the maximum growth of plants.

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: 4s

Michigan soil management group: Islandlake—5a; Blue Lake—4a

508D—Islandlake-Blue Lake sands, 6 to 18 percent slopes

Setting

Landform: Kames, outwash plains, and moraines

Map Unit Composition

Islandlake and similar soils: 45 to 65 percent

Blue Lake and similar soils: 35 to 45 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon and somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils

Typical Profile

Islandlake

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; brown sand

Bhs—7 to 10 inches; very dark brown sand

Bs1—10 to 18 inches; dark reddish brown sand

Bs2—18 to 27 inches; brown sand

E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material

E—5 to 8 inches; pinkish gray sand

Bhs—8 to 13 inches; dark brown sand

Bs—13 to 28 inches; brown and strong brown sand

E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand

E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 12 to 18 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: Islandlake—somewhat excessively drained; Blue Lake—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid or 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 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, these soils are poorly suited to building site development. Extensive land shaping is needed.

Septic tank absorption fields

- Because of the slope, these soils are generally unsuited to use as sites for 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: 6s

Michigan soil management group: Islandlake—5a; Blue Lake—4a

508E—Islandlake-Blue Lake sands, 18 to 35 percent slopes

Setting

Landform: Outwash plains, kames, and moraines

Map Unit Composition

Islandlake and similar soils: 45 to 65 percent

Blue Lake and similar soils: 35 to 45 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The excessively drained Rubicon and somewhat excessively drained Coppler soils in landscape positions similar to those of the major soils

Typical Profile

Islandlake

Oe—0 to 2 inches; moderately decomposed plant material

E—2 to 7 inches; brown sand

Bhs—7 to 10 inches; very dark brown sand

Bs1—10 to 18 inches; dark reddish brown sand

Bs2—18 to 27 inches; brown sand

E and Bt—27 to 80 inches; light yellowish brown sand with bands of strong brown loamy sand

Blue Lake

Oe—0 to 5 inches; moderately decomposed plant material

E—5 to 8 inches; pinkish gray sand

Bhs—8 to 13 inches; dark brown sand

Bs—13 to 28 inches; brown and strong brown sand

E and Bt1—28 to 51 inches; light brown sand with bands of strong brown loamy sand

E and Bt2—51 to 80 inches; light brown sand with bands of brown loamy sand

Soil Properties and Qualities

Slope: 18 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: Islandlake—somewhat excessively drained; Blue Lake—well drained

Available water capacity: Low

Shrink-swell potential: Low

Permeability: Rapid or 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 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, 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.
- 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: 7s

Michigan soil management group: Islandlake—5a; Blue Lake—4a

509A—Colonville-Thunderbay complex, 0 to 3 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Colonville and similar soils: 45 to 50 percent

Thunderbay and similar soils: 40 to 45 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Ausable and Tawas soils in landscape positions similar to those of the major soils
- The somewhat poorly drained Au Gres soils in landscape positions similar to those of the Colonville soil

Typical Profile

Colonville

A—0 to 11 inches; very dark gray and very dark grayish brown, mottled, calcareous very fine sandy loam

C1—11 to 16 inches; brown, mottled, calcareous very fine sandy loam

C2—16 to 80 inches; stratified, pale brown, mottled, calcareous fine sand, silt loam, and very fine sandy loam

Thunderbay

A—0 to 10 inches; black, mottled silt loam

Cg—10 to 18 inches; dark gray, mottled silt loam

Oa—18 to 26 inches; black muck

C_g—26 to 37 inches; stratified, dark gray and gray, mottled silt, silt loam, and very fine sandy loam and black muck

2Cg1—37 to 53 inches; grayish brown and dark grayish brown, calcareous sand

2Cg2—53 to 80 inches; grayish brown, calcareous gravelly sand

Soil Properties and Qualities

Slope: 0 to 2 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: Colonville—somewhat poorly drained; Thunderbay—poorly drained

Available water capacity: Moderate

Shrink-swell potential: Low

Permeability: Colonville—moderate; Thunderbay—moderate or moderately rapid in the loamy part and rapid in the sandy part

Frequency and most likely period of flooding: Colonville—occasional (December, January, February, March, April, May); Thunderbay—occasional (January, February, March, April, May, September, October, November, December)

Depth to seasonal high water table: Colonville—1.0 foot (March, April, May); Thunderbay—at the surface (January, February, March, April, May, September, October, November, December)

Months in which ponding does not occur: Thunderbay—June, July, August

Depth and most likely period of ponding: Colonville—not ponded; Thunderbay—0.5 foot (January, February, March, April, May, September, October, November, December)

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted on these soils.

Building site development

- Because cutbanks are not stable and are subject to caving, trench walls should be reinforced.
- Because of flooding and ponding, these soils are generally unsuited to building site development.

Septic tank absorption fields

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

Interpretive Groups

Land capability classification: 5w

Michigan soil management group: Colonville—L-2c-c; Thunderbay—L-2c

510—Deerheart silt loam

Setting

Landform: Lake plains

Map Unit Composition

Deerheart and similar soils: 85 to 100 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The poorly drained Wakeley and very poorly drained Tawas soils in landscape positions similar to those of the Deerheart soil
- The somewhat poorly drained Algonquin, Bowers, and Allendale soils in the slightly higher landscape positions

Typical Profile

Deerheart

Ap—0 to 6 inches; very dark grayish brown, mottled silt loam

Bg—6 to 27 inches; gray, mottled silty clay loam

BC—27 to 43 inches; light olive brown, mottled, calcareous silty clay loam

C—43 to 80 inches; mottled, calcareous, stratified, brown silty clay loam and light olive brown very fine sandy loam, silt, and silt loam

Soil Properties and Qualities

Slope: 0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Available water capacity: High

Shrink-swell potential: Moderate

Permeability: Slow

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: May, June, July, August, September

Depth and most likely period of ponding: 0.5 foot (January, February, March, April, May, October, November, December)

Use and Management

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

Cropland

- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.
- Subsurface drains can reduce the wetness if a suitable outlet is available.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of 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.
- 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 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 and seedling mortality, 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: 1.5c

511B—Parmalee fine sandy loam, 0 to 6 percent slopes***Setting***

Landform: Lake plains

Map Unit Composition

Parmalee and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deerheart soils in the lower landscape positions
- The somewhat poorly drained Bowers soils in landscape positions similar to or slightly lower than those of the Parmalee soil
- The moderately well drained Morganlake and Negwegon soils in landscape positions similar to those of the Parmalee soil

Typical Profile**Parmalee**

Ap—0 to 8 inches; black fine sandy loam

E/B—8 to 18 inches; brown fine sandy loam and loam

Bt1—18 to 22 inches; brown loam

Bt2—22 to 33 inches; dark yellowish brown silty clay loam

BC—33 to 51 inches; brown, mottled, calcareous silty clay loam

C—51 to 80 inches; yellowish brown, mottled, calcareous silty clay loam

Soil Properties and Qualities

Slope: 0 to 6 percent

Hazard of soil blowing: Moderate

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Available water capacity: Very high

Shrink-swell potential: Low

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 1.5 to 3.0 feet (April and 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

- 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: 1.5a

511C—Parmalee fine sandy loam, 6 to 12 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Parmalee and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The poorly drained Deerheart soils in the lower landscape positions
- The somewhat poorly drained Bowers soils in landscape positions similar to or slightly lower than those of the Parmalee soil

- The moderately well drained Morganlake and Negwegon soils in landscape positions similar to those of the Parmalee soil

Typical Profile

Parmalee

- Ap—0 to 8 inches; black fine sandy loam
- E/B—8 to 18 inches; brown fine sandy loam and loam
- Bt1—18 to 22 inches; brown loam
- Bt2—22 to 33 inches; dark yellowish brown silty clay loam
- BC—33 to 51 inches; brown, mottled, calcareous silty clay loam
- C—51 to 80 inches; yellowish brown, mottled, calcareous silty clay loam

Soil Properties and Qualities

- Slope:* 6 to 12 percent
- Hazard of soil blowing:* Moderate
- Surface runoff class:* Very high
- Potential for frost action:* High
- Depth to restrictive feature:* More than 80 inches
- Drainage class:* Moderately well drained
- Available water capacity:* Very high
- Shrink-swell potential:* Low
- Permeability:* Slow
- Flooding:* None
- Depth to seasonal high water table:* 1.5 to 3.0 feet (April and 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

- Buildings should be designed so that they conform to the natural slope of the land. Land shaping is necessary in some areas.
- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.

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.
- 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: 1.5a

512A—Algonquin-Springport silt loams, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Algonquin and similar soils: 50 to 60 percent

Springport and similar soils: 35 to 40 percent

Contrasting inclusions: 0 to 15 percent

Minor Components

Contrasting inclusions:

- The very poorly drained Tawas and poorly drained Deerheart and Wakeley soils in landscape positions similar to those of the Springport soil
- The somewhat poorly drained Bowers and Allendale soils in landscape positions similar to those of the Algonquin soil
- The moderately well drained Negwegon and Kellogg soils in the higher landscape positions

Typical Profile

Algonquin

Ap—0 to 6 inches; very dark grayish brown silt loam

Bt1—6 to 15 inches; brown, mottled clay

Bt2—15 to 18 inches; brown, mottled, calcareous silty clay loam

BC—18 to 35 inches; brown, mottled, calcareous silty clay loam

C—35 to 80 inches; light yellowish brown, mottled, calcareous silty clay loam

Springport

Ap1—0 to 4 inches; very dark gray silt loam

Ap2—4 to 9 inches; very dark gray, mottled silty clay loam

Eg—9 to 11 inches; dark gray, mottled silty clay

Bg—11 to 16 inches; greenish gray, mottled silty clay

Cg—16 to 48 inches; gray, mottled, calcareous silty clay loam

C—48 to 80 inches; brown, stratified, calcareous silt loam to silty clay loam

Soil Properties and Qualities

Slope: Algonquin—0 to 3 percent; Springport—0 to 2 percent

Hazard of soil blowing: Slight

Surface runoff class: High

Potential for frost action: High

Depth to restrictive feature: More than 80 inches

Drainage class: Algonquin—somewhat poorly drained; Springport—poorly drained

Available water capacity: High

Shrink-swell potential: High

Permeability: Very slow

Flooding: None

Depth to seasonal high water table: Algonquin—0.5 foot to 1.5 feet (April, May);

Springport—at the surface (January, February, March, April, May, September, October, November, December)

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

Depth and most likely period of ponding: Algonquin—not ponded; Springport—0.5 foot (January, February, March, April, May, October, November, December)

Use and Management

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

Cropland

- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.
- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.
- Subsurface drains can reduce the wetness if a suitable outlet is available.
- Because of the restricted permeability, subsurface drains should be narrowly spaced.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of soil tests helps to ensure the maximum growth of plants.

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 and seedling mortality, trees are generally not planted in the wetter areas of this map unit.

Building site development

- Buildings can be constructed on well compacted fill material, which raises the site a sufficient distance above the water table.
- Because of ponding, the wetter areas of this map unit are generally unsuited to building site development.

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.

- Because of ponding, the wetter areas of this map unit are generally unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 3w

Michigan soil management group: Algonquin—1.5b; Springport—1.5c

513A—Bowers loam, 0 to 3 percent slopes

Setting

Landform: Lake plains

Map Unit Composition

Bowers and similar soils: 90 to 100 percent

Contrasting inclusions: 0 to 10 percent

Minor Components

Contrasting inclusions:

- The moderately well drained Kellogg and Negwegon soils in the slightly higher landscape positions
- The poorly drained Deerheart soils in the slightly lower landscape positions

Typical Profile

Bowers

Ap—0 to 8 inches; very dark grayish brown loam

B/E—8 to 11 inches; mottled, brown silty clay loam and grayish brown sandy loam

Bt—11 to 25 inches; brown, mottled silty clay loam

BC—25 to 45 inches; brown, mottled, calcareous silty clay loam

C—45 to 80 inches; stratified, light yellowish brown, mottled, calcareous silty clay loam and silt loam

Soil Properties and Qualities

Slope: 0 to 3 percent

Hazard of soil blowing: Slight

Surface runoff class: High

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: Moderate

Permeability: Slow

Flooding: None

Depth to seasonal high water table: 0.5 foot (April and May)

Ponding: None

Use and Management

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

Cropland

- Conservation tillage systems, contour farming, cover crops, and sod-based rotations help to prevent the detachment and loss of nutrients associated with sediment and thus minimize the loss of solid-phase nitrogen and phosphorus.

- Returning crop residue to the soil, adding other organic material, and including grasses and legumes in the cropping sequence improve soil structure, infiltration, and permeability.
- Minimizing tillage and tilling and harvesting at the proper soil moisture content help to prevent excessive compaction.
- Most adapted crops can be grown if an adequate drainage system is installed.
- In some areas, improving drainage is difficult because adequate outlets are not available.
- Subsurface drains can reduce the wetness if a suitable outlet is available.

Pasture

- Restricted grazing during wet periods helps to prevent compaction and poor tilth.
- Proper stocking rates, a grazing system, and deferred grazing during wet periods help to keep the pasture in good condition.
- Adding lime and fertilizer according to the results of soil tests helps to ensure the maximum growth of plants.

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 and by using such harvest methods as selective cutting and strip cutting.
- 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 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: 2w

Michigan soil management group: 1.5b

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 for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Carla Scherer, Executive Director, Oscoda County Conservation District, and Bob Ojala, Director, Oscoda County Extension, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1997, approximately 8,419 acres was used as cropland or for pasture and hay (Michigan Department of Agriculture, 1997). The potential for increased crop production is fair and is heavily dependent upon the length of the growing season and soil types. Production can be increased by applying the latest technology on all of the cropland in the county. If fertility is enhanced, the production of forage crops has the most potential for improvement.

Soil type is the major issue on much of the cropland in Oscoda County. The soils are dominantly sandy, and sandy textures contribute to the low agricultural production in the area. Forage crops can be grown, but droughty conditions during the growing season adversely affect yields.

Subsurface tile drainage is not commonly used in Oscoda County. Drainage ditches provide outlets for surface and subsurface drainage.

Care must be exercised to prevent drainage in areas of designated wetlands. Drainage in these areas could violate existing wetland laws and regulations and may jeopardize receipt of USDA benefits. Information about the design of drainage systems for each kind of soil is available in local offices of the Natural Resources Conservation Service.

Erosion-control practices provide a protective surface cover, reduce the runoff rate, and increase the rate of water infiltration. Conservation tillage, which leaves crop residue on the surface, increases the rate of water infiltration and helps to control runoff and erosion. No-till farming is highly encouraged because it reduces the hazard of erosion. No-till farming requires high levels of management and relies on herbicides and insecticides for weed and pest control. It is especially effective in controlling erosion in areas of the less clayey, less sloping soils in the county. No-till cropping is primarily used for pasture and wildlife food plots.

Soil blowing is a hazard on soils that have a surface layer of sand, loamy sand, or sandy loam. Using surface mulch to maintain the plant cover, planting small grain buffer strips, leaving crop residue on the surface, and maintaining a rough surface through tillage help to control soil blowing. Field windbreaks of adapted trees and shrubs planted at right angles to the prevailing wind provide long-term protection from erosion.

Soil fertility is naturally low in the sandy soils in the county. It is medium in most of the loamy soils. The soils that formed on till plains or moraines, such as Ossineke and Bamfield soils, are moderately high in natural fertility. Soil fertility is quite variable because of differences in past land use and management. Most of the soils in the county are medium acid to neutral in the surface layer. Additions of lime, bio ash, and fertilizer to the soil should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Extension Service can help to determine the kind and amount of nutrients to be applied (Michigan State University, 1992).

Forage crops are the main field crops suited to the climate and soils in Oscoda County (fig. 8). Alfalfa is a commonly grown legume. Grasses grown for hay and pasture are mainly orchardgrass and timothy.

Specialty crops, such as strawberries and raspberries, are grown only on a limited acreage in the county. The well drained loamy sands, sandy loams, and loams are suited to these crops. The latest information about growing specialty crops can be obtained at local offices of the Michigan State University Extension.

Much of the permanent pasture in the county is in areas where erosion can be a hazard. Other areas of pasture are on wet soils. Control of erosion is particularly important during seeding operations. The need for lime and fertilizer should be determined by the results of soil tests, and adequate amounts should be applied as required.

Grazing when the soils are wet can cause surface compaction, which hinders the growth of pasture plants. Using proper harvesting methods, such as those used for hay or silage, can increase plant growth and minimize soil compaction.

The productivity of a pasture and its ability to protect the soil surface are influenced by the number of livestock the pasture supports, the length of time the livestock graze, and the rainfall distribution. Good pasture management includes maintaining key forage plants by applying proper stocking rates, applying a system of pasture rotation, deferring grazing, grazing at the proper season, applying fertilizer as appropriate, and supplying water at strategic locations for livestock.



Figure 8.—Areas of Algonquin soils (foreground) are commonly used for pasture and hay or for growing small grain crops or corn silage. Kellogg soils are on the side slopes in the background, and Klacking soils are on the wooded summit.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of 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 table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961).

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, 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, 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.

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 the soils in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

At the end of 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 Extension.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 8,361 acres in Oscoda County, or nearly 2 percent of the total acreage, meets the requirements for prime farmland.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The 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."

Hydric Soils

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, 2006) 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 Vasilas, 2006).

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 have soils (occurring as major components of the map unit) that 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 (Hurt and Vasilas, 2006; National Research Council, 1995).

- 13—Tawas-Lupton mucks
- 14—Dawson-Loxley peats
- 19—Leafriver muck
- 23—Ausable-Bowstring mucks, frequently flooded
- 24A—Kinross-Au Gres complex, 0 to 3 percent slopes (Kinross soil)
- 50B—Au Gres-Kinross-Croswell complex, 0 to 6 percent slopes (Kinross soil)
- 51—Tawas-Leafriver mucks
- 58A—Wakeley-Allendale complex, 0 to 3 percent slopes (Wakeley soil)
- 67A—Bowers-Deerheart complex, 0 to 3 percent slopes (Deerheart soil)
- 70—Lupton muck
- 71—Tawas muck
- 86—Histosols and Aquents, ponded
- 87—Ausable muck, frequently flooded
- 93B—Tacoda-Wakeley complex, 0 to 4 percent slopes (Wakeley soil)
- 250D—Glossudalfs-Haplosaprists, euic, complex, nearly level to hilly (Haplosaprists)
- 252A—Haplosaprists, euic-Au Gres complex, nearly level (Haplosaprists)
- 254A—Haplosaprists, euic-Fluvaquents-Aquic Udipsamments complex, nearly level, occasionally flooded (Haplosaprists and Fluvaquents)
- 272—Endoaquods-Fluvaquents, occasionally flooded, complex
- 273—Leafriver-Wakeley complex
- 274—Typic Endoaquods, wet
- 280—Aquents and Histosols, ponded
- 281—Haplosaprists, dysic
- 282—Haplosaprists, euic
- 352B—Deford-Au Gres-Croswell complex, 0 to 6 percent slopes (Deford soil)

- 360—Wakeley muck
- 368A—Au Gres-Deford complex, 0 to 3 percent slopes (Deford soil)
- 369—Deford muck
- 371—Springport silt loam
- 509A—Colonville-Thunderbay complex, 0 to 3 percent slopes, occasionally flooded (Thunderbay soil)
- 510—Deerheart silt loam
- 512A—Algonquin-Springport silt loams, 0 to 3 percent slopes (Springport soil)

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform. Onsite investigation is recommended to determine the occurrence and location of hydric soils.

Forestland

Lora Freer, resource professional, help prepare this section.

The forest resource of Oscoda County is very extensive. The wood industry is of vital importance to the economy of the county. The harvesting and processing of wood products account for the employment of a large percentage of the workforce (fig. 9). Because of the large amount of forestland in the county and the close proximity to wood-processing industries, the future economy of the county will continue to be based on woodland products. Proper woodland management, on both public and private lands, will be required to ensure that the desired types of raw materials will be available in sufficient quantities to meet the future demands of the forest industry.

The forest products industry is very strong in the area. Many small, private sawmills produce such products as cants, landscape timbers, posts, pallets, and lumber for



Figure 9.—Timber harvest in an area of Grayling sand, 0 to 6 percent slopes. Because of droughtiness, fall through spring is the preferred season for logging activities in areas of this soil.

local use. Custom lumber kilns, log cabins, and processed log home manufacturing are also produced in Oscoda County. The utilization of all species is excellent. The firewood market also is steady.

In 1997, Oscoda County had approximately 316,000 acres of woodland. This acreage represents about 87 percent of the total area. The largest forested areas are the Huron National Forest and the Au Sable State Forest.

Forest cover types are diverse and include approximately 50,400 acres of northern hardwoods, 67,600 acres of oaks, 105,400 acres of pines, 75,000 acres of aspen-birch, 13,300 acres of lowland conifers, and 4,300 acres of lowland hardwoods.

Forestland Management and Productivity

Table 7 can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils suitable for wood crops are listed.

Erosion hazard ratings 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.

Site preparation ratings are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as *well suited*, *poorly suited*, or *unsuited* to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Seedling mortality ratings 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.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Suggested trees to plant are those that are suitable for commercial wood production.

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, and poorly suited. 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 in the column *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.

Plant Associations

The Ecological Classification System (ECS) for the Huron-Manistee National Forests (Pregitzer and others, 1987) was developed for National Forest System information needs. These needs include delineating land units for planning analyses, predicting vegetative structure and the distribution of wildlife habitat, planning desired future conditions within and across geologic regions for conservation of biological diversity, and evaluating ecological processes, such as forest succession or soil productivity. The overall purpose of the ECS is to provide an ecological framework for integrated resource planning and management.

The ECS is an ecological approach to defining biological potential of the National Forest land base.

Multiple ecological factors were used to define the classification and map units. Climate, landform, soil, and vegetation information was integrated before map units were described and delineated. Information regarding vegetation and soils was predominantly used to delineate map units in the field.

Plant associations are used in the mapping process to help identify local map units. Plant associations are combinations of late successional overstories and groups of associated understory and ground flora species. Species groups are associated with the map unit. However, species composition may vary within the map units, and any given species within a species group may not occur at a particular place. In some cases, the plant association does not reflect soil characteristics and potential. In landscapes that do not support diagnostic plant communities because of natural variability or disturbance, soil and landform variables serve alone as differentiating map unit criteria.

The following paragraphs describe the plant associations in the survey area. They provide information about the landform and soil type on which the plants occur, the potential late successional overstory and the diagnostic understory, and the ground flora species characteristic of the association.

Plant Association 1.—Black oak (*Quercus velutina*)-White oak (*Quercus alba*)-Blueberry (*Angustifolium*). This association is characteristic of dry, nutrient-poor landscapes in areas of sandy soils. Potential late successional natural vegetation includes species that have adapted to harsh conditions and frequent fire disturbance. The association is represented by overstory species of black oak (*Quercus velutina*), white oak (*Quercus alba*), and northern pin oak (*Quercus ellipsoidalis*). Distinguishing ground flora and understory species include blueberry (*Vaccinium angustifolium*), cowwheat (*Melampyrum lineare*), trailing arbutus (*Epigaea repens*), huckleberry (*Gaylussacia baccata*), brackenfern (*Pteridium aquilinum*), red maple (*Acer rubrum*) seedlings, and oak (*Quercus* spp.) seedlings.

Plant Association 2.—Mixed oak (*Quercus* spp.)-Red maple (*Acer rubrum*)-Starflower (*Trientalis borealis*). This association is primarily in areas of sandy soils that exhibit weak spodic development. Potential late successional overstory species include black oak (*Quercus velutina*), white oak (*Quercus alba*), northern red oak (*Quercus rubra*), red maple (*Acer rubrum*), red pine (*Pinus resinosa*), and eastern white pine (*Pinus strobus*). Distinguishing ground flora and understory species include mapleleaf viburnum (*Viburnum acerifolium*), brackenfern (*Pteridium aquilinum*), wintergreen (*Gaultheria procumbens*), starflower (*Trientalis borealis*), blueberry (*Vaccinium angustifolium*), red maple (*Acer rubrum*) seedlings and saplings, and juneberry species (*Amelanchier* spp.).

Plant Association 3.—Northern red oak (*Quercus rubra*)-Red maple (*Acer rubrum*)-Mapleleaf viburnum (*Viburnum acerifolium*). This association is primarily on sandy morainal landscapes and in areas of well developed soils on lake plains. Potential late successional overstory species include northern red oak (*Quercus rubra*), red maple (*Acer rubrum*), and eastern white pine (*Pinus strobus*). Distinguishing ground flora and understory species include mapleleaf viburnum (*Viburnum acerifolium*), sarsaparilla (*Aralia nudicaulis*), lily of the valley (*Maianthemum canadense*), large-leaved aster (*Aster macrophyllus*), squaw root (*Conopholis americana*), red maple (*Acer rubrum*) seedlings and saplings, and witch hazel (*Hamamelis virginiana*).

Plant Association 4.—Northern red oak (*Quercus rubra*)-Red maple (*Acer rubrum*)-Trefoil (*Desmodium* spp.). This association is primarily on moraines and lake beds that have deposits of sand overlying fine-loamy materials. Potential late successional overstory species include northern red oak (*Quercus rubra*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), and white ash (*Fraxinus americana*). Distinguishing ground flora and understory species include trefoils (*Desmodium* spp.), downy yellow violet (*Viola pubescens*), flowering dogwood (*Corpus florida*), black cherry (*Prunus serotina*) seedlings, sugar maple (*Acer saccharum*) seedlings, mapleleaf viburnum (*Viburnum acerifolium*), and red maple (*Acer rubrum*) seedlings.

Plant Association 5.—Sugar maple (*Acer saccharum*)-American beech (*Fagus grandifolia*)-Clubmoss (*Lycopodium obscurum*, *L. lucidulum*). This association is on sandy moraines and sandy lake plains in areas of soils that have dark horizons in the subsoil. Potential late successional overstory species include sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), northern red oak (*Quercus rubra*), and red maple (*Acer rubrum*). The association is characterized by low diversity and coverage of ground flora along the forest floor. Distinguishing understory and ground flora species include lily of the valley (*Maianthemum canadense*), clubmosses (*Lycopodium obscurum* and *L. lucidulum*), true Solomon's seal (*Polygonatum biflorum*), longstalk sedge (*Carex pedunculata*), and sugar maple (*Acer saccharum*) seedlings.

Plant Association 6.—Sugar maple (*Acer saccharum*)-White ash (*Fraxinus americana*)-Sweet cicely (*Osmorhiza claytonii*). This association is in areas of coarse textured over fine textured soils on moraines, till plains, and lake beds. Potential late

successional overstory species include sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), American basswood (*Tilia americana*), eastern hemlock (*Tsuga canadensis*), black cherry (*Prunus serotina*), and northern red oak (*Quercus rubra*). The association is characterized by diverse and abundant ground flora on the forest floor. Distinguishing understory and ground flora species include sweet cicely (*Osmorhiza claytonii*), wild leek (*Allium tricoccum*), false miterwort (*Tiarella cordifolia*), true miterwort (*Mitella diphylla*), Canada white violet (*Viola canadensis*), bellwort (*Uvularia perfoliata*), grapefern (*Botrychium virginianum*), blue cohosh (*Caulophyllum thalictroides*), sugar maple (*Acer saccharum*) seedlings, and white ash (*Fraxinus americana*) seedlings.

Plant Association 7.—Northern red oak (*Quercus rubra*)-Red maple (*Acer rubrum*)-Leatherleaf (*Chamaedaphne calyculata*)-Blueberry (*Vaccinium angustifolium*). This association is in areas of poorly drained, acidic sand deposits on outwash plains and lake plains. Potential late successional overstory species include northern red oak (*Quercus rubra*), black oak (*Quercus velutina*), white oak (*Quercus alba*), red maple (*Acer rubrum*), and eastern white pine (*Pinus strobus*). The association is characterized by species adapted to acidic and frequent anaerobic soil conditions. Distinguishing understory and ground flora species include leatherleaf (*Chamaedaphne calyculata*), blueberry (*Vaccinium angustifolium*), Labrador tea (*Ledum groenlandicum*), wintergreen (*Gaultheria procumbens*), dewberry (*Rubus* spp.), brackenfern (*Pteridium aquilinum*), and speckled alder (*Alnus rugosa*).

Plant Association 8.—Red maple (*Acer rubrum*)-Balsam fir (*Abies balsamea*)-Bunchberry dogwood (*Corpus canadensis*). This association is on outwash plains, flood plains, and lake plains in areas of sandy deposits that are slightly acid to alkaline. Potential late successional overstory species include red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), balsam fir (*Abies balsamea*), and eastern white pine (*Pinus strobus*). Distinguishing understory and ground flora species include lily of the valley (*Maianthemum canadense*), bunchberry dogwood (*Corpus canadensis*), goldthread (*Coptis groenlandica*), wintergreen (*Gaultheria procumbens*), and spinulose shield fern (*Dryopteris spinulosa*).

Plant Association 9.—Mixed ash (*Fraxinus* spp.)-Basswood (*Tilia americana*)-Downy yellow violet (*Viola pubescens*). This association is in areas of poorly drained, nutrient-rich, loamy soils on lake beds, till plains, and flood plains. Organic deposits are shallow. Potential late successional overstory species include American basswood (*Tilia americana*), eastern hemlock (*Tsuga canadensis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), and northern whitecedar (*Thuja occidentalis*). Distinguishing understory and ground flora species include downy yellow violet (*Viola pubescens*), maidenhair fern (*Adiantum pedatum*), cinnamon fern (*Osmunda cinnamomea*), jack-in-the-pulpit (*Arisaema triphyllum*), and bellwort (*Uvularia perfoliata*).

Plant Association 10.—Black spruce (*Picea mariana*)-Tamarack (*Larix laricina*)-Labrador tea (*Ledum groenlandicum*). This association is in areas of poorly drained, dysic organic deposits on outwash plains and lake plains. The organic deposits are deep. The association is characterized by acid bog conditions. The overstory is sparse, and black spruce (*Picea mariana*) and tamarack (*Larix laricina*) are the predominant species. Distinguishing understory and ground flora species include Labrador tea (*Ledum groenlandicum*), leatherleaf (*Chamaedaphne calyculata*), sphagnum (*Sphagnum* spp.), and speckled alder (*Alnus rugosa*).

Plant Association 11.—Northern whitecedar (*Thuja occidentalis*)-Eastern hemlock (*Tsuga canadensis*)-Canada violet (*Viola canadense*). This association is in areas of poorly drained, euc organic deposits on flood plains, till plains, and lake beds. The organic deposits are deep. Potential late successional overstory species include northern whitecedar (*Thuja occidentalis*), eastern hemlock (*Tsuga canadensis*), white spruce (*Picea glauca*), and black ash (*Fraxinus nigra*). Distinguishing understory and

ground flora species include Canada violet (*Viola canadense*), maidenhair fern (*Adiantum pedatum*), bedstraws (*Galium* spp.), and lily of the valley (*Maianthemum canadense*).

Table 9 shows the commonly observed characteristic overstory and understory vegetation for selected soils in the survey area. The table lists the common name and the PLANTS database symbol (<http://plants.usda.gov>) for the *common trees* and the *characteristic vegetation*.

Plant Communities on Selected Soils

Table 10 lists plants that are typically associated with soils in Oscoda County. Plants are listed in the table on the basis of sample site information. Sample sites were selected for vegetative analysis after detailed soil maps and soil series descriptions were completed in an area. Once the soils were verified, representative vegetative communities were selected. The sample sites are in areas that are relatively free of recent disturbances, such as fire, tree harvesting, or noticeable insect or disease infestations, and that exhibit typical stocking densities.

The sample sites were approximately 10,000 square feet in size. Plant species were identified and recorded, and an ocular estimate was made of the percent coverage for each species. The percentage of canopy coverage was estimated for tree species, and the percentage of ground coverage was estimated for other plants. Coverage values were grouped into seven classes to facilitate compilation and to clarify results. The seven classes are:

- Class 1—less than 1 percent coverage
- Class 2—1 to 5 percent coverage
- Class 3—5 to 25 percent coverage
- Class 4—25 to 50 percent coverage
- Class 5—50 to 75 percent coverage
- Class 6—75 to 95 percent coverage
- Class 7—95 to 100 percent coverage

The number after each plant species in table 10 represents the mean coverage class for that species for the map unit component listed. This number can be correlated to the relative dominance of overstory and understory vegetation. Plants that have a high number cover more of the canopy or ground than those with a low number.

The plants listed in table 10 for each map unit were selected on the basis of information from two to ten sample sites. They are considered the typical plants in the map unit, but they are not the only plants in the map unit (Voss, 1972, 1985, 1996). Only the common plant names are shown in the table. The common names are those on a national list of plant names (<http://plants.usda.gov>).

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To

ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 11 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 11 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

Approximately 75 percent of Oscoda County is publicly owned. Recreation and tourism are important to the local economy. The large tracts of continuous public lands in Oscoda County attract many outdoor enthusiasts. Popular activities include fishing (fig. 10), canoeing, hunting, birdwatching, snowmobiling, camping, hiking, and horseback riding. Motorcross bike trails also are available.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation. 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



Figure 10.—Mio Pond and its accessible fishing platforms provide important recreational opportunities in the survey area.

design, or expensive installation procedures. Poor performance and high maintenance can be expected.

The ratings in the table 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 table 12 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.

Lawns, landscaping, and 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

Lora Freer, resource professional, helped prepare this section.

Oscoda County has a diversity of habitats, including aquatic, wetland, forestland, and some grassland habitats. Aquatic habitats include Mio Pond and smaller lakes and numerous small ponds. The Au Sable River system provides habitat for fish, eagles, osprey, beaver, and many other species. Stands of jack pine in the county are frequented by the rare Kirtland's warbler (fig. 11). Alder thickets, oak ridges, and aspen-birch stands provide food and shelter for an abundance of wildlife species. Food and thermal cover are provided by stands of northern whitecedar and some pure stands of hemlock. Stands of sugar maple and beech are inhabited by pileated woodpeckers and ovenbirds.

The survey area supports healthy populations of cottontail rabbits, snowshoe hares, beavers, turkeys, ruffed grouse, bears, otters, minks, weasels, badgers, and bobcats. Elk and cougar are occasionally seen in the county. Because major areas in the county provide ideal habitat, the number of black bears is increasing.



Figure 11.—Oscoda County has important habitat for the endangered Kirtland's warbler. (Photo by Ron Austing.)

A Kirtland's warbler habitat management area runs through most of the county, where large areas of jack pine are managed for this rare bird (fig. 12). The Michigan Department of Natural Resources and the U.S. Forest Service use large clearcuts and fire to manage public lands for Kirtland's warbler habitat (fig. 13).

Grassland songbirds are favored by land management practices from an unusual segment of the human population. These birds find refuge in areas that normally would be forested but have been maintained as pasture by the Amish. Bobolinks, meadowlarks, song sparrows, bluebirds, yellow warblers, and kingbirds benefit from these land use patterns. Species that prefer the interface or margins of open areas and forestland also benefit from agricultural practices.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

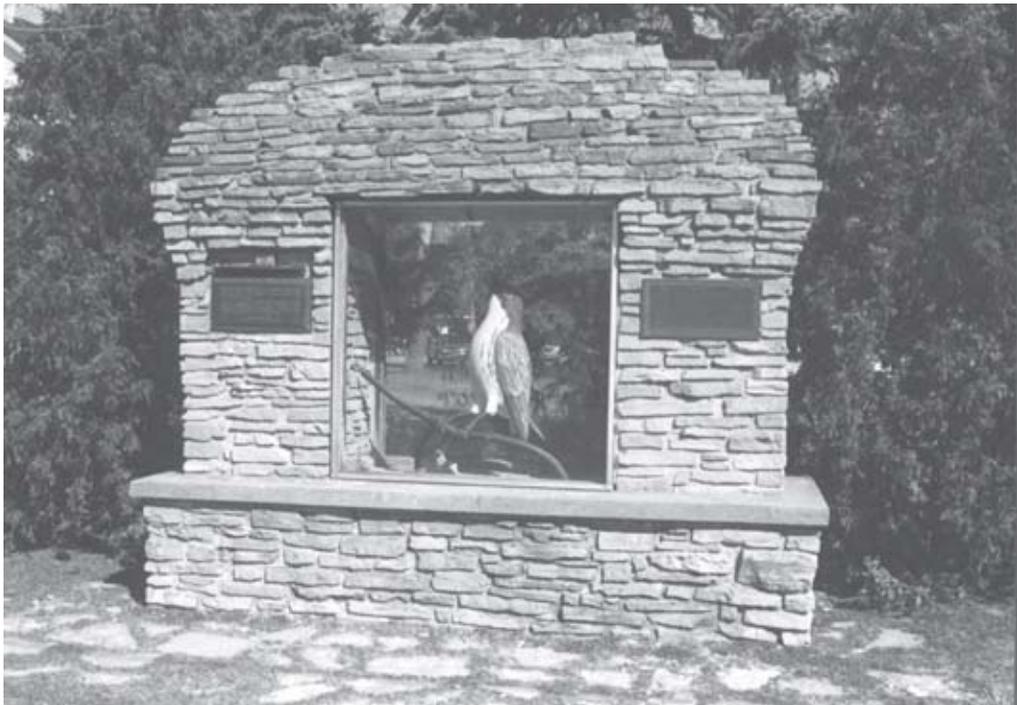


Figure 12.—The Kirtland's Warbler Memorial in Mio commemorates past and ongoing efforts that have successfully preserved this endangered bird and its habitat in the county and surrounding areas.



Figure 13.—An area of Grayling and Graycalm soils that has been clearcut and replanted with jack pine. Small openings are left in the plantings to attract the endangered Kirtland's warbler.

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, and oats.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness.

Examples of these plants are oak, poplar, cherry, apple, hawthorn, dogwood, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey,

determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

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. Table 14 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, and shallow excavations.

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.

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

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. 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.

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 wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 16 gives information about the soils as potential sources of gravel, sand, topsoil, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, 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 *improbable* or *probable* as sources of sand and gravel. They are rated as good, fair, or poor sources of roadfill and topsoil. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The features that limit the soils as sources of these materials are specified in the table.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading

the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; aquifer-fed excavated ponds; grassed waterways; and drainage. 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.

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 nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine 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 18 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 (fig. 14). "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

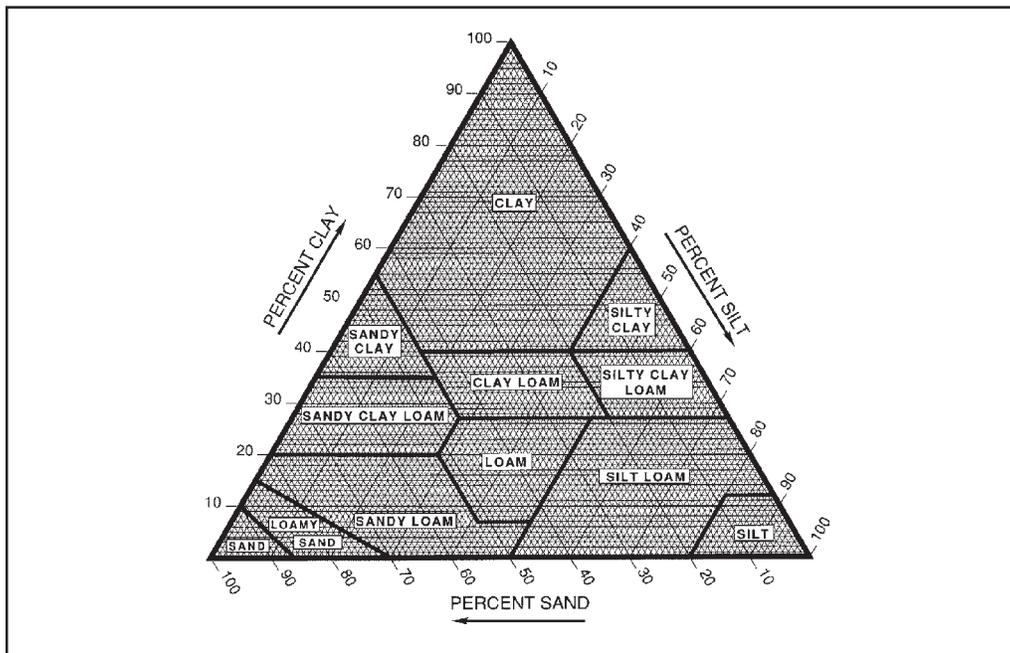


Figure 14.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

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 of the Soils

Table 19 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 linear extensibility, 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 the table as the K factor and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K_f 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," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

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 of the Soils

Table 20 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 the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained 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 21 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 of the restrictive layer, which significantly affects 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 22 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. *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 23 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 23 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.

Table 23 also shows the *kind of water table*, that is, apparent or perched. 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. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is

unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (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 24 gives 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 Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Endoaquolls (*Endo*, meaning within, plus *aquolls*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Endoaquolls.

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 fine-loamy, mixed, active, mesic Typic Endoaquolls.

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.

Taxonomic Units and Their Morphology

In this section, each soil series or higher taxonomic unit recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified. 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) and in the "Field Book for Describing and Sampling Soils" (Schoeneberger and others, 2002). 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. Following the pedon description is the range of important characteristics of the soils in the series.

Alfic Haplorthods, sandy

This taxonomic unit consists of well drained soils on end moraines and ground moraines. These soils formed in sandy and loamy deposits. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Sandy, mixed, frigid Alfic Haplorthods

Reference pedon of Alfic Haplorthods, sandy, in an area of Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling, approximately 2,440 feet north and 1,490 feet east of the southwest corner of sec. 19, T. 27 N., R. 5 E., Mitchell Township, Alcona County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 43 minutes 05 seconds N. and long. 83 degrees 52 minutes 58 seconds W., WGS 84:

- Oe—0 to 2 inches; partially decomposed hardwood leaf litter; abrupt smooth boundary.
- A—2 to 4 inches; very dark grayish brown (10YR 3/2) loamy sand, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; many very fine and fine roots; moderately acid; clear irregular boundary.
- E—4 to 7 inches; grayish brown (10YR 5/2) sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many fine roots; moderately acid; clear irregular boundary.
- Bs1—7 to 11 inches; brown (7.5YR 4/4) sand; weak medium subangular blocky structure; friable; moderately acid; gradual wavy boundary.
- Bs2—11 to 32 inches; strong brown (7.5YR 5/6) sand; weak fine subangular blocky structure; very friable; moderately acid; gradual wavy boundary.
- Bw—32 to 37 inches; reddish yellow (7.5YR 6/6) sand; single grain; loose; moderately acid; clear irregular boundary.
- 2Bt—37 to 42 inches; brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; common distinct brown (7.5YR 4/4) clay films on faces of peds; slightly acid; clear wavy boundary.
- 3C1—42 to 77 inches; reddish yellow (7.5YR 6/6) sand; single grain; loose; neutral; gradual wavy boundary.
- 3C2—77 to 180 inches; brownish yellow (10YR 6/6) sand; single grain; loose; neutral.

The depth to the loamy material ranges from 20 to 45 inches. The content of gravel ranges from 0 to 14 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is dominantly loamy sand, but the range includes sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. It is sand or loamy sand. Some pedons have discontinuous E horizons.

The Bs horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sand or loamy sand. The Bw horizon also is sand or loamy sand.

The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 3 to 6. It is sandy loam, fine sandy loam, sandy clay loam, or silt loam. If the 2Bt horizon is above a depth of 40 inches, it is less than 6 inches thick. If this horizon is below a depth of 40 inches, the thickness ranges to 30 inches.

The 3C horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 to 6. It is sand, coarse sand, or loamy sand.

A very deep water table phase is recognized.

Alfic Haplorthods, sandy over loamy

This taxonomic unit consists of well drained soils on moraines. These soils formed in sandy and loamy deposits. Permeability is rapid in the sandy material and moderate or moderately slow in the loamy material. Slopes range from 0 to 45 percent.

Taxonomic classification: Sandy over loamy, mixed, frigid Alfic Haplorthods

Reference pedon of Alfic Haplorthods, sandy over loamy, in an area of Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling, 800 feet south and 1,200 feet east of the northwest corner of sec. 8, T. 26 N., R. 5 E., Mitchell Township, Alcona County, Michigan; USGS Curran, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 39 minutes 47 seconds N. and long. 83 degrees 51 minutes 47 seconds W., WGS 84:

- Oe—0 to 2 inches; partially decomposed hardwood leaf litter; abrupt smooth boundary.
- A—2 to 4 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; many very fine and fine and common medium roots; moderately acid; clear wavy boundary.
- E—4 to 6 inches; dark grayish brown (10YR 4/2) sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many very fine and few medium and coarse roots; moderately acid; clear wavy boundary.
- Bs1—6 to 9 inches; brown (7.5YR 4/4) sand; weak medium granular structure; very friable; many fine and few medium and coarse roots; strongly acid; clear smooth boundary.
- Bs2—9 to 27 inches; strong brown (7.5YR 5/6) sand; weak fine granular structure; friable; many very fine and fine and few medium and coarse roots; medium acid; gradual wavy boundary.
- 2Bt—27 to 44 inches; brown (7.5YR 5/4) sandy clay loam; moderate medium subangular blocky structure; firm; common distinct brown (7.5YR 4/4) clay films on faces of peds; common fine roots; neutral; abrupt wavy boundary.
- 3C1—44 to 52 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; neutral; gradual wavy boundary.
- 3C2—52 to 120 inches; brownish yellow (10YR 6/6) sand; single grain; loose; neutral.

The thickness of the sandy deposits ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent in the sandy material and from 0 to 14 percent in the Bt and C horizons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. It is sand or loamy sand.

The Bs1 horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is sand or loamy sand.

The Bs2 horizon has hue of 5YR or 7.5YR and value and chroma of 4 to 6. It is sand or loamy sand.

Some pedons have a BC horizon. This horizon is as much as 10 inches thick. It is loamy sand or sand.

The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 3 to 6. It is sandy clay loam, clay loam, silt loam, or silty clay loam. The content of fine and

coarser sand ranges from 5 to 50 percent. The content of clay ranges from 18 to 35 percent.

The 3C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 6. It is sand, loamy sand, loamy fine sand, fine sand, or sandy loam. Strata of sandy clay loam, silt loam, or silty clay loam may occur in some pedons; these strata are less than 3 inches thick.

Algonquin Series

The Algonquin series consists of somewhat poorly drained soils on lake plains (fig. 15). These soils formed in silty and clayey deposits. Permeability is slow or very slow. Slopes range from 0 to 3 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Aquic Hapludalfs

Typical pedon of Algonquin silt loam, 0 to 3 percent slopes, 2,390 feet east and 1,990 feet north of the southwest corner of sec. 34, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 41 minutes 13.65 seconds N. and long. 84 degrees 10 minutes 55.81 seconds W., NAD 27:

- Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure parting to moderate very fine subangular blocky; friable; many fine and medium roots; about 1 percent gravel; neutral; abrupt smooth boundary.
- Bt1—6 to 15 inches; brown (7.5YR 5/4) clay; strong coarse angular blocky structure parting to moderate very fine subangular blocky; firm; common fine and few medium roots; many prominent brown (7.5YR 4/4) clay films on faces of peds and along root channels; common prominent very dark grayish brown (10YR 3/2) worm channels; common fine prominent light greenish gray (10Y 7/1) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear wavy boundary.
- Bt2—15 to 18 inches; brown (7.5YR 5/4) silty clay loam; strong coarse subangular blocky structure parting to moderate fine subangular blocky; firm; few fine roots; many distinct brown (7.5YR 4/4) clay films along root channels; common fine and medium prominent greenish gray (10Y 6/1) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; clear wavy boundary.
- BC—18 to 35 inches; brown (7.5YR 5/4) silty clay loam; moderate coarse subangular blocky structure parting to moderate fine subangular blocky; firm; few fine roots; common prominent light gray (10YR 7/2) irregular carbonate coats along fracture planes; many coarse prominent greenish gray (10Y 6/1) iron depletions in the matrix; many fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.
- C—35 to 80 inches; light yellowish brown (10YR 6/4) silty clay loam; moderate medium platy structure inherent from deposition; firm; common fine black soft iron and manganese oxides; few thin varves of silt loam; many prominent light gray (10YR 7/2) carbonate coatings along fracture planes; many coarse prominent greenish gray (10Y 6/1) and light greenish gray (10Y 7/1) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 11 to 15 inches. The content of gravel ranges from 0 to 1 percent throughout the profile.



Figure 15.—A profile of Algonquin silt loam. This soil is slowly permeable and has a perched seasonal high water table at a depth of 0.5 foot to 1.5 feet. Areas of this soil are considered prime farmland where drained. Depth is marked in inches.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 to 3.

The Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is silty clay, silty clay loam, or clay.

The BC horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4. It is silty clay or silty clay loam or is stratified with these textures.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4. It is silty clay or silty clay loam or is stratified with these textures.

Allendale Series

The Allendale series consists of somewhat poorly drained soils on lake plains and outwash plains. These soils formed in sandy material over clayey deposits. Permeability is rapid in the sandy material and slow or very slow in the underlying clayey material. Slopes range from 0 to 3 percent.

Taxonomic classification: Sandy over clayey, mixed, semiactive, frigid Alfic
Epiaquods

Typical pedon of Allendale sand, in an area of Wakeley-Allendale complex, 0 to 3 percent slopes, 1,550 feet west and 2,725 feet south of the northeast corner of sec. 3, T. 26 N., R. 2 E., north part of Big Creek Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 25.9 seconds N. and long. 84 degrees 10 minutes 38.25 seconds W., NAD 27:

- Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt smooth boundary.
- A—1 to 5 inches; very dark gray (10YR 3/1) sand, dark gray (2.5Y 4/1) dry; weak medium granular structure; very friable; many very fine, fine, medium, and coarse roots; about 1 percent gravel; slightly acid; abrupt wavy boundary.
- E—5 to 10 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/1) dry; weak fine subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 2 percent gravel; few fine prominent strong brown (7.5YR 4/6 and 5/6) masses of iron accumulation in the matrix in the lower part of the horizon; slightly acid; abrupt wavy boundary.
- Bs1—10 to 17 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; few black (2.5Y 2.5/1) iron and manganese oxides; 5 to 15 percent weakly cemented ortstein in the lower part of the horizon; about 4 percent gravel; common fine distinct strong brown (7.5YR 4/6 and 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear irregular boundary.
- Bs2—17 to 32 inches; dark yellowish brown (10YR 4/6) sand; weak medium and coarse subangular blocky structure; friable; few very fine, fine, and medium roots; few black (2.5Y 2.5/1) iron and manganese oxides; 5 to 15 percent weakly cemented ortstein; about 4 percent gravel and 1 percent cobbles; many fine faint strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) and many fine distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.
- 2Bt1—32 to 40 inches; reddish brown (5YR 4/3) clay; strong medium angular blocky structure; firm; few very fine, fine, and medium roots; common distinct reddish brown (5YR 4/3) clay films on faces of peds; common prominent greenish gray (10GY 6/1) carbonate coatings along fracture planes and vertical ped surfaces; about 1 percent gravel; common fine prominent greenish gray (10GY 6/1) iron depletions in the matrix; many fine prominent yellowish brown (10YR 5/6 and 5/8) and common distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear irregular boundary.
- 2Bt2—40 to 63 inches; brown (10YR 5/3) silty clay; moderate medium angular blocky structure; firm; few very fine, fine, and medium roots; common distinct reddish brown (5YR 4/3) clay films on faces of peds; common prominent greenish gray (10GY 6/1) carbonate coatings along fracture planes and vertical ped surfaces; about 1 percent gravel; common fine prominent greenish gray (10GY 6/1) iron depletions in the matrix; many fine prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) and common distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear irregular boundary.
- 2C—63 to 80 inches; dark grayish brown (10YR 4/2) silty clay; massive; firm; common prominent greenish gray (10GY 6/1) and white (10YR 8/1) carbonate coatings along fracture planes; common fine prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 20 to 45 inches. The thickness of the sandy material ranges from 20 to 40 inches. The content of gravel ranges from 0 to 7 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is loamy sand or sand.

The Bs1 horizon has hue of 7.5YR, value of 3, and chroma of 4. It is loamy sand or sand. A thin discontinuous Bhs horizon occurs in some pedons.

The Bs2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loamy sand or sand.

The 2Bt and 2C horizons have hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4. They are clay or silty clay.

Annalake Series

The Annalake series consists of moderately well drained soils on lake plains, outwash plains, and moraines. These soils formed in sandy and loamy materials over stratified loamy, sandy, and silty deposits. Permeability is moderate. Slopes range from 0 to 6 percent.

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haplorthods

Typical pedon of Annalake loamy fine sand, 0 to 6 percent slopes, 2,550 feet north and 2,350 feet east of the southwest corner of sec. 16, T. 32 N., R. 4 E., Montmorency Township, Montmorency County, Michigan; USGS Royston, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 09 minutes 51 seconds N. and long. 83 degrees 57 minutes 20 seconds W., NAD 27:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loamy fine sand, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine, fine, and medium roots; about 1 percent gravel; strongly acid; abrupt wavy boundary.

E—9 to 11 inches; pinkish gray (7.5YR 6/2) fine sand, light gray (10YR 7/2) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; few very fine and fine roots; about 1 percent gravel; strongly acid; abrupt broken boundary.

Bs—11 to 16 inches; brown (7.5YR 4/4) loamy fine sand; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; 25 percent of the horizon is composed of weakly cemented columns and chunks of dark reddish brown (5YR 3/2) and strong brown (7.5YR 4/6) ortstein; about 1 percent gravel; strongly acid; clear irregular boundary.

E/B—16 to 30 inches; light brown (7.5YR 6/4) loamy sand, pinkish white (7.5YR 8/2) dry (E); occupies 60 percent of the horizon surrounding reddish brown (5YR 4/4) sandy loam (Bt); weak fine and medium subangular blocky structure; friable; common very fine and fine roots; many distinct reddish brown (5YR 4/4) clay films on faces of peds; about 1 percent gravel; strongly acid; abrupt wavy boundary.

Bt—30 to 37 inches; reddish brown (5YR 4/4) sandy loam; moderate medium and coarse subangular blocky structure; friable; common very fine and fine roots; many faint reddish brown (5YR 4/4) clay films on faces of peds; about 1 percent gravel; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.

BC—37 to 46 inches; reddish brown (5YR 5/4) sandy loam; weak coarse subangular blocky structure; very friable; about 1 percent gravel; common fine and medium prominent light greenish gray (5GY 7/1) iron depletions in the matrix; many

- medium and coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; neutral; clear wavy boundary.
- C—46 to 70 inches; light brown (7.5YR 6/4), stratified sandy loam, fine sandy loam, silt loam, and loamy sand; massive; very friable; about 1 percent gravel; many fine, medium, and coarse prominent light gray (5Y 7/1) iron depletions in the matrix; many fine, medium, and coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg—70 to 80 inches; light brownish gray (2.5Y 6/2), stratified silt, silt loam, sandy loam, sand, and fine sand; massive; very friable; about 1 percent gravel; many fine and medium prominent yellowish brown (10YR 5/8) and light brown (7.5YR 6/4) masses of iron accumulation in the matrix; violently effervescent; moderately alkaline.

The content of gravel ranges from 0 to 5 percent throughout the profile.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The A horizon is dominantly loamy fine sand, but the range includes fine sandy loam.

The E horizon and the E part of the E/B horizon have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4. They are dominantly fine sand, but the range includes loamy fine sand and sand.

The Bs horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4. Some pedons have a Bs2 horizon. This horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The Bs horizon is loamy sand or loamy fine sand.

The B part of the E/B horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4, and chroma of 4 to 6. They are dominantly sandy loam, but the range includes fine sandy loam and very fine sandy loam. Some pedons have a B/E horizon.

The BC horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4. It is sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 4. It is stratified sand, fine sand, sandy loam, silt loam, silt, loamy sand, fine sandy loam, very fine sand, and silty clay loam.

Aquents

Aquents consist of very poorly drained soils on moraines, lake plains, and outwash plains. These soils formed in sandy or loamy deposits. Permeability ranges from rapid to moderately slow. Slopes range from 0 to 2 percent.

Reference pedon of Aquents, in an area of Histosols and Aquents, ponded, 2,600 feet north and 600 feet west of the southeast corner of sec. 13, T. 23 N., R. 7 E., Wilber Township, Iosco County, Michigan; USGS Sid Town, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 23 minutes 19 seconds N. and long. 83 degrees 31 minutes 32 seconds W., NAD 27:

- Oa—0 to 3 inches; muck, black (N 2.5/) broken face and rubbed; about 8 percent fiber, 1 percent rubbed; weak fine subangular blocky structure; very friable; strongly acid; abrupt smooth boundary.
- Bg—3 to 20 inches; gray (N 5/) sand; single grain; loose; strongly acid; clear wavy boundary.
- Cg—20 to 80 inches; light brownish gray (10YR 6/2) sand; single grain; loose; slightly acid.

The content of gravel ranges from 0 to 20 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is muck, mucky sand, mucky loamy sand, mucky loamy fine sand, sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The Bg horizon has hue of 7.5YR to 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 3. It is sand, fine sand, loamy sand, or loamy fine sand.

The Cg horizon has hue of 5Y to 2.5YR, value of 4 to 6, and chroma of 1 to 6. It is sand, gravelly sand, or fine sand. Some pedons have a 2C horizon. This horizon is sandy loam, gravelly sandy loam, fine sandy loam, loam, silt loam, clay loam, or silty clay loam.

Aquic Udipsamments

This taxonomic unit consists of somewhat poorly drained soils on flood plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 3 percent.

Taxonomic classification: Mixed, frigid Aquic Udipsamments

Reference pedon of Aquic Udipsamments, in an area of Borosaprists-Fluvaquents-Aquic Udipsamments complex, nearly level, 1,500 feet north and 500 feet west of the southeast corner of sec. 31, T. 24 N., R. 9 E., Oscoda Township, Oscoda County, Michigan; USGS Foot Site, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 25 minutes 05 seconds N. and long. 83 degrees 23 minutes 50 seconds W., WGS 84:

- A—0 to 6 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; many fine to coarse roots; about 5 percent gravel; very strongly acid; abrupt smooth boundary.
- C1—6 to 22 inches; brown (10YR 5/3) sand; weak medium subangular blocky structure; very friable; many fine to coarse roots; about 5 percent gravel; few medium faint light brownish gray (10YR 6/2) iron depletions in the matrix in the lower part of the horizon; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix in the lower part of the horizon; very strongly acid; clear wavy boundary.
- C2—22 to 45 inches; yellowish brown (10YR 5/4) sand; weak medium subangular blocky structure; very friable; many fine to coarse roots; few very dark gray (10YR 3/1) organic bands less than 1 inch thick; about 5 percent gravel; few medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very strongly acid; clear wavy boundary.
- C3—45 to 80 inches; grayish brown (10YR 5/2) sand; single grain; loose; few very dark gray (10YR 3/1) organic bands less than 1 inch thick; few medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent yellowish brown (10YR 5/8) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; very strongly acid.

The control section has variable textures within short horizontal distances. It is sand, fine sand, loamy sand, loamy fine sand, or coarse sand. There is an irregular decrease in carbon with increasing depth. The content of gravel ranges from 0 to 10 percent.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3.

The C horizon has hue of 5YR to 2.5Y or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 6.

Arenic Hapludalfs

This taxonomic unit consists of well drained soils on moraines, in glacial drainageways, and on outwash plains. These soils formed in sandy and loamy deposits. Permeability is rapid in the sandy material and moderate in the loamy material. Slopes range from 0 to 6 percent.

Taxonomic classification: Coarse-loamy, mixed, frigid Arenic Hapludalfs

Reference pedon of Arenic Hapludalfs, nearly level and undulating, 2,040 feet south and 2,440 feet east of the northwest corner of sec. 24, T. 26 N., R. 7 E., Millen Township, Alcona County, Michigan; USGS Barton City, Michigan, topographic quadrangle; lat. 44 degrees 38 minutes 07 seconds N. and long. 83 degrees 32 minutes 07 seconds W. WGS 84:

- Oe—0 to 2 inches; partially decomposed hardwood leaf litter; abrupt smooth boundary.
- A—2 to 4 inches; very dark gray (10YR 3/1) loamy sand, gray (10YR 5/1) dry; weak fine granular structure; very friable; many very fine and fine and few medium roots; moderately acid; clear irregular boundary.
- E—4 to 6 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak fine granular structure; friable; many very fine and fine and common medium roots; moderately acid; abrupt wavy boundary.
- Bw1—6 to 12 inches; dark yellowish brown (10YR 4/6) sand; weak medium subangular blocky structure; friable; common fine and medium roots; moderately acid; gradual smooth boundary.
- Bw2—12 to 32 inches; yellowish brown (10YR 5/6) loamy sand; weak medium subangular blocky structure; friable; few fine and medium roots; moderately acid; abrupt irregular boundary.
- 2Bt1—32 to 37 inches; strong brown (7.5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; few faint clay bridges between sand grains; slightly acid; abrupt wavy boundary.
- 2Bt2—37 to 47 inches; brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm; common very fine and fine roots; common faint brown (7.5YR 4/2) clay films on vertical faces of peds; neutral; abrupt wavy boundary.
- 3C1—47 to 72 inches; yellowish brown (10YR 5/6) loamy sand; single grain; loose; moderately alkaline; gradual wavy boundary.
- 3C2—72 to 80 inches; light yellowish brown (10YR 6/4) sand with strata of gravelly sand, fine sand, and loamy sand; single grain; loose; moderately alkaline.

The thickness of the sandy material ranges from 20 to 40 inches. The content of gravel ranges from 10 to 20 percent in the 2Bt and 3C horizons. Reaction ranges from strongly acid to slightly acid above the 2Bt horizon and from slightly acid to moderately alkaline below the 2Bt horizon. Stratified materials are commonly below the loamy materials.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is sand or loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. It is sand or loamy sand.

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

The 2Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam. The content of clay averages 10 to 35 percent.

The 2C horizon, if it occurs, has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam.

The 3C horizon is variable in color and texture. It is commonly stratified sands, loamy sands, or loams.

Au Gres Series

The Au Gres series consists of somewhat poorly drained soils on outwash plains, stream terraces, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 3 percent.

Taxonomic classification: Sandy, mixed, frigid Typic Endoaquods

Typical pedon of Au Gres sand, in an area of Deford-Au Gres-Croswell complex, 0 to 6 percent slopes, 2,600 feet west and 2,400 feet north of the southeast corner of sec. 30, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 42 minutes 11.12 seconds N. and long. 84 degrees 14 minutes 30.82 seconds W., NAD 27:

- A—0 to 4 inches; very dark gray (7.5YR 3/1) sand, dark gray (10YR 4/1) dry; weak medium granular structure; very friable; many very fine, fine, medium, and coarse roots; very strongly acid; abrupt smooth boundary.
- E—4 to 10 inches; gray (7.5YR 5/1) sand, light gray (10YR 7/1) dry; weak fine and medium subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 1 percent gravel; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix in the lower 2 inches of this horizon; very strongly acid; abrupt smooth boundary.
- Bhs—10 to 12 inches; dark reddish brown (5YR 3/3) sand; weak fine subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 1 percent gravel; few fine prominent brown (7.5YR 4/6) masses of iron accumulation in the matrix; very strongly acid; abrupt wavy boundary.
- Bs—12 to 16 inches; brown (7.5YR 4/4) sand; weak fine subangular blocky structure; friable; common very fine, fine, medium, and coarse roots; about 1 percent gravel; many fine and medium distinct strong brown (7.5YR 5/6) and many fine and medium prominent yellowish red (5YR 4/6, 5/6, and 5/8) and strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.
- BC—16 to 32 inches; yellowish brown (10YR 5/6) sand; weak medium subangular blocky structure; friable; few fine and medium roots; about 1 percent gravel; many fine faint strong brown (7.5YR 5/6), many fine distinct strong brown (7.5YR 5/8), and many fine prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.
- C1—32 to 45 inches; light yellowish brown (2.5Y 6/4) sand; single grain; loose; about 3 percent gravel; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.
- C2—45 to 80 inches; light olive brown (2.5Y 5/3) sand; single grain; loose; about 3 percent gravel; many medium distinct gray and dark gray (10YR 5/1 and 4/1) iron depletions in the matrix; moderately acid.

The depth to the C horizon ranges from 25 to 40 inches. The content of gravel ranges from 0 to 5 percent throughout the profile. The texture is sand throughout the profile.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 3.

The Bhs horizon has hue of 5YR and value and chroma of 2 or 3. The content of ortstein in this horizon commonly ranges from 0 to 30 percent.

The Bs horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The content of ortstein in this horizon commonly ranges from 0 to 20 percent.

The BC horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 6.

Ausable Series

The Ausable series consists of very poorly drained soils on flood plains. These soils formed in thin deposits of organic and sandy material. Permeability is moderate or moderately rapid in the organic material and rapid in the sandy material. Slopes range from 0 to 2 percent.

Taxonomic classification: Sandy, mixed, frigid Histic Humaquepts

Typical pedon of Ausable muck, in an area of Ausable-Bowstring mucks, frequently flooded, about 600 feet north and 700 feet east of the southwest corner of sec. 30, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 47 minutes 05.18 seconds N. and long. 84 degrees 22 minutes 09.21 seconds W., NAD 27:

Oa—0 to 11 inches; muck, black (10YR 2/1) broken face and rubbed; about 8 percent fiber, 1 percent rubbed; moderate fine and medium subangular blocky structure; very friable; many very fine and fine, common medium, and few coarse roots; moderately acid; abrupt wavy boundary.

C—11 to 16 inches; light olive brown (2.5Y 5/3) sand with thin discontinuous lenses of black (10YR 2/1) muck; single grain; loose; few fine, common medium, and few coarse roots; common fine and medium faint dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.

Cg1—16 to 23 inches; grayish brown (2.5Y 5/2) sand with thin ($\frac{1}{4}$ inch to 2 inches) layers of black (10YR 2/1) muck; single grain; loose; few very fine and fine, common medium, and few coarse roots; about 1 percent gravel; common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.

Cg2—23 to 48 inches; dark gray (2.5Y 4/1) and light brownish gray (2.5Y 6/2) sand with thin ($\frac{1}{4}$ inch to $1\frac{1}{2}$ inches) layers of black (2.5Y 2.5/1) muck; single grain; loose; about 1 percent gravel; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; moderately acid; gradual wavy boundary.

Cg3—48 to 80 inches; dark gray (2.5Y 4/1) and light yellowish brown (10YR 6/4) sand with thin ($\frac{1}{8}$ to $\frac{1}{2}$ inch) layers of black (2.5Y 2.5/1) muck; single grain; loose; about 8 percent gravel; few coarse prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline.

The thickness of the organic material ranges from 9 to 12 inches. Bands of organic material less than 1 inch thick occur within the control section. The content of gravel ranges from 0 to 10 percent throughout the profile.

In the unrubbed condition, the Oa horizon and the organic bands have hue of 5YR to 2.5Y or are neutral in hue. They have value of 2 or 3 and chroma of 0 to 2.

The C and Cg horizons have hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. They are dominantly sand, but the range includes loamy sand.

Bamfield Series

The Bamfield series consists of well drained soils on ground moraines and disintegration moraines. These soils formed in loamy materials overlying sandy

deposits. Permeability is moderately slow to very slow in the loamy material and rapid in the underlying sandy substratum. Slopes range from 12 to 70 percent.

Taxonomic classification: Fine-loamy, mixed, active, frigid Haplic Glossudalfs

Typical pedon of Bamfield fine sandy loam, sandy substratum, in an area of Bamfield, sandy substratum-Millersburg-Horsehead complex, 6 to 18 percent slopes, 925 feet north and 320 feet west of the southeast corner of sec. 12, T. 28 N., R. 2 E., north part of Elmer Township, Oscoda County, Michigan; USGS Oak Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 49 minutes 42.69 seconds N. and long. 84 degrees 07 minutes 55.29 seconds W., NAD 27:

- A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam, gray (7.5YR 5/1) dry; moderate fine subangular blocky structure; very friable; many very fine and fine and few medium and coarse roots; 2 percent gravel; moderately acid; abrupt wavy boundary.
- E—7 to 12 inches; brown (7.5YR 5/3) loamy fine sand, light gray (10YR 7/2) dry; moderate medium subangular blocky structure; friable; common very fine and fine and few medium and coarse roots; 2 percent gravel and 1 percent cobbles; strongly acid; clear wavy boundary.
- E/B—12 to 18 inches; brown (7.5YR 5/3) loamy sand, light gray (10YR 7/2) dry (E); moderate fine and medium subangular blocky structure; friable; occupies about 55 percent of the horizon surrounding peds of reddish brown (5YR 4/4) clay loam (Bt); moderate coarse subangular blocky structure; friable; common very fine and fine roots; few distinct reddish brown (5YR 4/4) clay films on faces of peds; 3 percent gravel; moderately acid; clear wavy boundary.
- Bt1—18 to 26 inches; reddish brown (5YR 4/4) and yellowish red (5YR 4/6) clay loam; moderate coarse subangular blocky structure; friable; few very fine, fine, medium, and coarse roots; common distinct reddish brown (5YR 4/4) and yellowish red (5YR 4/6) clay films on faces of peds; few lenses of yellowish red (5YR 4/6) sandy loam; 3 percent gravel; neutral; clear wavy boundary.
- Bt2—26 to 39 inches; reddish brown (5YR 4/4) loam; moderate and weak medium and coarse subangular blocky structure; friable; few very fine, fine, and medium roots; common prominent reddish brown (5YR 4/4) clay films on faces of peds; few lenses of strong brown (7.5YR 5/6) sandy loam and loamy sand; 8 percent gravel and 1 percent cobbles; slightly effervescent; slightly alkaline; clear wavy boundary.
- BC—39 to 53 inches; reddish brown (5YR 5/4) loam; weak medium and coarse subangular blocky structure; friable; few very fine and fine roots; common distinct reddish brown (5YR 5/4) clay films on vertical fracture planes; 9 percent gravel and 1 percent cobbles; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1—53 to 79 inches; reddish brown (5YR 5/4) loam; massive; friable; few very fine and fine roots in the upper part of the horizon; common prominent pinkish gray (7.5YR 7/2) carbonate coatings along fracture planes; one 2-inch-thick stratum of light yellowish brown (10YR 6/4) sand at a depth of 75 inches; 5 percent gravel, 2 percent cobbles, and 1 percent stones; violently effervescent; moderately alkaline; clear wavy boundary.
- 2C2—79 to 90 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; violently effervescent; strongly alkaline.

The depth to carbonates ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent in the upper part of the profile and from 0 to 25 percent in the 2C horizon. The content of cobbles ranges from 0 to 4 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. It is fine sandy loam.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4. It is dominantly loamy fine sand, but the range includes sandy loam, loamy sand, and fine sandy loam.

The E/B horizon has E material surrounding peds of Bt material. The E part of the horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4. It is loamy sand, sandy loam, or fine sandy loam. The Bt part of the horizon has hue of 5YR or 7.5YR and value and chroma of 3 to 6. It is clay loam or sandy clay loam. Some pedons have a B/E horizon.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is dominantly clay loam, but the range includes sandy clay loam and loam. The content of clay in the Bt1 horizon ranges from 27 to 35 percent. In some pedons the lower part of the Bt horizon contains carbonates.

The BC horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4. It is dominantly loam, but the range includes clay loam, fine sandy loam, sandy loam, and sandy clay loam.

The C horizon, if it occurs, has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. It is dominantly loam, but the range includes clay loam, fine sandy loam, sandy loam, and sandy clay loam. Carbonates are present.

The 2C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6. It is sand, loamy sand, gravelly sand, or gravelly loamy sand. The content of gravel ranges from 0 to 25 percent.

Blue Lake Series

The Blue Lake series consists of well drained soils on moraines and outwash plains. These soils formed in sandy deposits. Permeability is rapid or moderately rapid. Slopes range from 0 to 70 percent.

Taxonomic classification: Sandy, mixed, frigid Lamellic Haplorthods

Typical pedon of Blue Lake sand, in an area of Islandlake-Blue Lake sands, 0 to 6 percent slopes, 2,300 feet south and 750 feet west of the northeast corner of sec. 3, T. 27 N., R. 3 E., west part of Comins Township, Oscoda County, Michigan; USGS Comins, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 45 minutes 44.93 seconds N. and long. 84 degrees 03 minutes 12.69 seconds W., NAD 27:

Oe—0 to 5 inches; partially decomposed leaves, twigs, and grass; abrupt smooth boundary.

E—5 to 8 inches; pinkish gray (7.5YR 6/2) sand, pinkish gray (7.5YR 6/2) dry; weak fine and medium subangular blocky structure; very friable; common very fine, fine, and medium and few coarse roots; about 2 percent gravel; strongly acid; abrupt wavy boundary.

Bhs—8 to 13 inches; dark brown (70 percent 7.5YR 3/3 and 30 percent 7.5YR 3/4) sand; weak fine and medium subangular blocky structure; very friable; many very fine and fine and common medium and coarse roots; a column 7 inches wide of material from this horizon extends downward; about 2 percent gravel; strongly acid; clear wavy boundary.

Bs1—13 to 22 inches; brown (7.5YR 4/4) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine and few medium and coarse roots; a column 7 inches wide of material from the Bhs horizon extends downward to a depth of 15 inches; about 2 percent gravel; strongly acid; clear wavy boundary.

Bs2—22 to 28 inches; strong brown (7.5YR 4/6) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine roots; about 2 percent gravel; moderately acid; clear wavy boundary.

E and Bt1—28 to 51 inches; light brown (7.5YR 6/4) sand (E), light yellowish brown (10YR 6/4) dry; weak medium and coarse subangular blocky structure; very friable; lamellae of strong brown (7.5YR 4/6) loamy sand (Bt); weak medium and coarse subangular blocky structure; very friable; few very fine and fine roots; lamellae are $\frac{1}{16}$ to 1 inch thick; common faint strong brown (7.5YR 4/6) clay bridges between sand grains in the lamellae; about 3 percent gravel; strongly acid; gradual wavy boundary.

E and Bt2—51 to 80 inches; light brown (7.5YR 6/4) sand (E), light brown (7.5YR 6/4) dry; weak medium and coarse subangular blocky structure; very friable; lamellae of brown (7.5YR 5/4) loamy sand (Bt); weak medium and coarse subangular blocky structure; very friable; few very fine, fine, and medium roots; lamellae are $\frac{1}{2}$ inch to 3 inches thick; many faint brown (7.5YR 5/4) clay bridges between sand grains in the lamellae; thin lenses of gravelly sand and fine sand starting at a depth of more than 65 inches; about 3 percent gravel; slightly alkaline.

The depth to the E and Bt horizon ranges from 18 to 42 inches. The content of gravel ranges from 0 to 4 percent throughout the profile.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2. It is sand.

The Bhs horizon has hue of 7.5YR, value of 3, and chroma of 2 or 3. It is sand.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is 0 to 20 percent ortstein fragments that are weakly to strongly cemented.

The E part of the E and Bt horizon makes up 65 to 75 percent of the horizon. It has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 or 4. The Bt part of the E and Bt horizon has hue of 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is sandy loam or loamy sand. Some pedons contain thin lamellae of sandy clay loam. The individual lamellae range from $\frac{1}{8}$ inch to 3 inches in thickness. The total thickness of the lamellae ranges from 6 to 12 inches. The E and Bt horizon also contains irregular masses of Bt material. These masses are 1 to 5 inches thick.

Some pedons have a C horizon.

Bowers Series

The Bowers series consists of somewhat poorly drained soils on lake plains. These soils formed in loamy and clayey materials over stratified clayey and silty deposits. Permeability is slow. Slopes range from 0 to 3 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Aquic Glossudalfs

Typical pedon of Bowers loam, in an area of Bowers-Deerheart complex, 0 to 3 percent slopes, 350 feet north and 700 feet east of the southwest corner of sec. 15, T. 25 N., R. 2 W., South Branch Township, Crawford County, Michigan; USGS Roscommon North, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 33 minutes 20.69 seconds N. and long. 84 degrees 32 minutes 51.51 seconds W., NAD 27:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure parting to moderate fine granular; very friable; many fine and common medium roots; neutral; abrupt smooth boundary.

B/E—8 to 11 inches; about 70 percent brown (10YR 4/3) silty clay loam (B); moderate medium subangular blocky structure; firm; about 30 percent pockets and ped coatings of grayish brown (10YR 5/2) sandy loam (E), light gray (10YR 7/2) dry; many fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds and in root channels; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

- Bt—11 to 25 inches; brown (10YR 4/3) silty clay loam; moderate medium and coarse subangular blocky structure parting to moderate fine subangular blocky; firm; common fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds and in root channels; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
- BC—25 to 45 inches; brown (10YR 5/3) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common distinct light gray (10YR 7/2) carbonate coatings on faces of peds; common fine distinct (10YR 5/1) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.
- C—45 to 80 inches; light yellowish brown (2.5Y 6/4), stratified silty clay loam and silt loam; massive; firm; common distinct light gray (10YR 7/2) carbonate coatings along fracture planes; common prominent light brownish gray (10YR 6/2) gleyed coatings along fracture planes; common medium prominent gray (5Y 6/1) iron depletions in the matrix; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 18 to 36 inches.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is dominantly loam, but the range includes sandy loam and fine sandy loam.

The E part of the B/E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is loam or sandy loam. Some pedons have an E or an E/B horizon.

The B part of the B/E horizon and the Bt horizon have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. They are silty clay loam or clay loam.

The BC horizon has colors and textures similar to those of the Bt horizon.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is stratified silty clay loam and silt loam.

Bowstring Series

The Bowstring series consists of very poorly drained soils on flood plains. These soils formed in organic materials that are stratified with thin sandy deposits. Permeability is moderately slow to moderately rapid in the organic material and rapid in the sandy layers. Slopes are 0 to 1 percent.

Taxonomic classification: Euic, frigid Fluvaquentic Haplosaprists

Typical pedon of Bowstring muck, in an area of Ausable-Bowstring mucks, frequently flooded, about 30 feet north and 2,325 feet west of the southeast corner of sec. 29, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 47 minutes 00.72 second N. and long. 84 degrees 20 minutes 34.20 seconds W., NAD 27:

- Oa1—0 to 13 inches; muck, black (10YR 2/1) broken face and rubbed; about 15 percent fiber, 10 percent rubbed; weak fine and medium granular structure; very friable; many very fine and fine and few medium roots; moderately acid; clear wavy boundary.
- Oa2—13 to 32 inches; muck, very dark brown (7.5YR 2.5/2) broken face and rubbed; about 55 percent fiber, 15 percent rubbed; weak medium granular structure; very friable; few very fine and fine roots; slightly acid; abrupt smooth boundary.
- C—32 to 47 inches; light olive brown and light yellowish brown (2.5Y 5/3 and 6/3) sand; single grain; loose; stratified with bands of very dark brown (10YR 2/2)

organic material that are 1/2 inch to 2 inches thick and make up about 40 percent of the horizon; slightly acid; abrupt smooth boundary.

O_a—47 to 74 inches; muck, black (7.5YR 2.5/1) broken face and rubbed; about 25 percent fiber, 7 percent rubbed; weak medium subangular blocky structure parting to weak fine subangular blocky; very friable; moderately acid; abrupt wavy boundary.

Cg—74 to 80 inches; dark grayish brown (2.5Y 4/2) sand; single grain; loose; moderately acid.

The organic material is primarily herbaceous material, but woody material makes up as much as 30 percent in some pedons. Thin layers of mineral soil material are within the organic material. The thickness of the Cg horizon does not exceed 8 inches. Depth to the Cg horizon ranges from 18 to 48 inches.

The O horizons have hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2 or are neutral in hue and have value of 2. The organic material is dominantly muck, but some pedons have thin layers of mucky peat.

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

Chinwhisker Series

The Chinwhisker series consists of moderately well drained soils on outwash plains and stream terraces. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 4 percent.

Taxonomic classification: Sandy, mixed, frigid Lamellic Haplorthods

Typical pedon of Chinwhisker sand, 0 to 4 percent slopes, 2,460 feet south and 460 feet east of the northwest corner of sec. 32, T. 28 N., R. 2 E., north part of Elmer Township, Oscoda County, Michigan; USGS Oak Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 34.37 seconds N. and long. 84 degrees 13 minutes 54.97 seconds W., NAD 27:

O_e—0 to 1 inch; partially decomposed forest litter; abrupt smooth boundary.

A—1 to 2 inches; black (7.5YR 2.5/1) sand, dark grayish brown (10YR 4/2) dry; 30 percent grayish brown (10YR 5/2) uncoated sand grains; weak fine granular structure; very friable; many very fine and fine, common medium, and few coarse roots; about 1 percent gravel; extremely acid; abrupt wavy boundary.

E—2 to 5 inches; grayish brown (10YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine to medium roots; about 1 percent gravel; extremely acid; abrupt wavy boundary.

Bs₁—5 to 10 inches; brown (7.5YR 4/4) sand; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine and fine and few medium roots; about 1 percent gravel; very strongly acid; clear wavy boundary.

Bs₂—10 to 21 inches; yellowish brown (10YR 5/6) sand; weak fine and medium subangular blocky structure; very friable; few very fine and fine, common medium, and few coarse roots; about 1 percent gravel; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix beginning at a depth of 20 inches; strongly acid; clear wavy boundary.

Bs₃—21 to 29 inches; yellowish brown (10YR 5/8) sand; weak fine and medium subangular blocky structure; very friable; few very fine, fine, and coarse roots; about 1 percent gravel; common fine prominent yellowish red (5YR 4/6) and common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.

E and Bt1—29 to 45 inches; light olive brown (2.5Y 5/4) sand (E), very pale brown (10YR 7/4) dry; single grain; loose; lamellae of strong brown (7.5YR 5/6) loamy sand (Bt); weak fine and medium subangular blocky structure; very friable; few very fine, fine, and coarse roots; lamellae are $\frac{1}{16}$ to $\frac{3}{4}$ inch thick; few faint strong brown (7.5YR 5/6) clay bridges between sand grains in the lamellae; about 1 percent gravel; common fine and medium prominent brownish yellow (10YR 6/8) and common fine and medium distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.

E and Bt2—45 to 80 inches; light yellowish brown (10YR 6/4) sand (E), very pale brown (10YR 7/3) dry; single grain; loose; lamellae of yellowish brown (10YR 5/6) loamy sand (Bt); weak fine and medium subangular blocky structure; very friable; lamellae are $\frac{1}{16}$ to 1 inch thick with a total accumulation of about 4 inches; common faint yellowish brown (10YR 5/6) clay bridges between sand grains in the lamellae; about 1 percent gravel; common fine and medium prominent brownish yellow (10YR 6/8) and common fine and medium distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; moderately acid.

The depth to the redoximorphic features ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2.

The Bs horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 8. It is sand or loamy sand.

The E' part of the E and Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. It is sand.

The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It occurs as lamellae $\frac{1}{16}$ inch to 2 inches in thickness with a total accumulation to a depth of 80 inches of 5 inches or less. It is loamy sand.

Colonville Series

The Colonville series consists of somewhat poorly drained soils on flood plains. These soils formed in loamy materials over stratified silty and sandy deposits. Permeability is moderate or moderately rapid. Slopes range from 0 to 3 percent.

Taxonomic classification: Coarse-loamy, mixed, active, calcareous, frigid
Fluvaquentic Endoaquolls

Typical pedon of Colonville very fine sandy loam, occasionally flooded, 1,000 feet south and 1,200 feet west of the northeast corner of sec. 12, T. 21 N., R. 5 E., Burleigh Township, Iosco County, Michigan; USGS Whittemore, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 13 minutes 51 seconds N. and long. 83 degrees 46 minutes 05 seconds W., NAD 27:

A1—0 to 6 inches; very dark gray (10YR 3/1) very fine sandy loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common fine to coarse roots; strongly effervescent; slightly alkaline; clear wavy boundary.

A2—6 to 11 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; common fine to coarse roots; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline; clear wavy boundary.

C1—11 to 16 inches; brown (10YR 4/3) very fine sandy loam; moderate medium granular structure; friable; many medium and fine roots; few medium distinct gray

(10YR 5/1) iron depletions in the matrix; common coarse distinct dark yellowish brown (10YR 4/6) and many medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear wavy boundary.

C2—16 to 80 inches; pale brown (10YR 6/3), stratified fine sand, silt loam, and very fine sandy loam; weak medium platy structure inherent from deposition; very friable; many medium roots; streaks of very dark grayish brown (10YR 3/2) organic material; common medium distinct dark gray (10YR 4/1) iron depletions in the matrix; common medium faint light yellowish brown (10YR 6/4) and common medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; moderately effervescent; slightly alkaline.

The thickness of the mollic epipedon ranges from 11 to 14 inches. The content of gravel is 0 to 1 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is very fine sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. It is stratified very fine sandy loam, sandy loam, fine sandy loam, silt loam, fine sand, and sand.

Coppler Series

The Coppler series consists of somewhat excessively drained soils on outwash plains, in glacial drainage channels, on kames, and on moraines. These soils formed in sandy and gravelly deposits. Permeability ranges from moderately rapid to very rapid. Slopes range from 0 to 35 percent.

Taxonomic classification: Loamy-skeletal, mixed, semiactive, frigid Arenic Hapludalfs

Typical pedon of Coppler sand, in an area of Coppler-Horsehead sands, 0 to 6 percent slopes, 2,475 feet north and 2,430 feet east of the southwest corner of sec. 8, T. 28 N., R. 3 E., west part of Clinton Township, Oscoda County, Michigan; USGS Comins, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 49 minutes 59.95 seconds N. and long. 84 degrees 06 minutes 09.41 seconds W., NAD 27:

Oe—0 to 3 inches; partially decomposed leaves, twigs, and grass; abrupt smooth boundary.

E—3 to 6 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 7/2) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine to coarse roots; about 3 percent gravel; extremely acid; abrupt wavy boundary.

Bw1—6 to 14 inches; strong brown (7.5YR 4/6) gravelly sand; weak very fine and fine subangular blocky structure; very friable; many very fine and fine and few medium and coarse roots; about 20 percent gravel; strongly acid; clear wavy boundary.

Bw2—14 to 20 inches; strong brown (7.5YR 5/6) gravelly sand; weak fine and medium subangular blocky structure parting to single grain; very friable; common very fine and fine roots; about 15 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.

2Bt—20 to 26 inches; strong brown (7.5YR 4/6) very gravelly sandy clay loam; moderate fine and medium subangular blocky structure; very friable; many very fine and fine roots; many faint strong brown (7.5YR 4/6) clay bridges between sand grains; about 59 percent gravel; neutral; clear wavy boundary.

3BC—26 to 31 inches; brownish yellow (10YR 6/6) very gravelly sand; single grain; loose; few very fine and fine roots; about 42 percent gravel and 2 percent cobbles; strongly effervescent; strongly alkaline; abrupt wavy boundary.

3C1—31 to 50 inches; light yellowish brown (10YR 6/4) extremely gravelly sand; single grain; loose; about 74 percent gravel and 1 percent cobbles; strongly effervescent; strongly alkaline; abrupt smooth boundary.

3C2—50 to 80 inches; light yellowish brown (10YR 6/4), stratified sand and very gravelly sand; single grain; loose; about 35 percent gravel and 5 percent cobbles; strongly effervescent; strongly alkaline.

The depth to the argillic horizon ranges from 20 to 34 inches. The depth to carbonates ranges from 26 to 34 inches.

The A horizon, if it occurs, has hue of 7.5YR or 10YR, value of 2 or 2.5, and chroma of 1 or 2. The content of gravel ranges from 2 to 5 percent. Reaction is very strongly acid or strongly acid.

The E horizon has hue of 7.5YR, value of 5 or 6, and chroma of 2 or 3. The content of gravel ranges from 3 to 7 percent. Reaction ranges from extremely acid to strongly acid.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sand or gravelly sand. The content of gravel ranges from 3 to 20 percent. The content of cobbles ranges from 0 to 5 percent. Reaction ranges from strongly acid to slightly acid.

The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 4 to 6. It is very gravelly sandy clay loam or very gravelly sandy loam. The content of gravel ranges from 35 to 60 percent. The content of cobbles ranges from 0 to 5 percent. Reaction is neutral or slightly alkaline.

The 3BC horizon has hue of 10YR and value and chroma of 6. The content of gravel ranges from 35 to 75 percent. The content of cobbles ranges from 1 to 5 percent. The texture is very gravelly sand or extremely gravelly sand. Reaction is moderately alkaline or strongly alkaline.

The 3C horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. It is very gravelly sand or extremely gravelly sand. Some pedons have thin strata of sand, coarse sand, or gravelly sand. The content of gravel ranges from 35 to 75 percent. The content of cobbles ranges from 1 to 5 percent. Reaction is moderately alkaline or strongly alkaline.

Croswell Series

The Croswell series consists of moderately well drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy, mixed, frigid Oxyaquic Haplorthods

Typical pedon of Croswell sand, 0 to 6 percent slopes, 60 feet east and 1,820 feet south of the northwest corner of sec. 31, T. 28 N., R. 2 E., north part of Elmer Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 42.41 seconds N. and long. 84 degrees 15 minutes 06.94 seconds W., NAD 27:

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; about 3 percent fine gravel; slightly acid; abrupt smooth boundary.

E—2 to 8 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; very weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots; about 3 percent fine gravel; strongly acid; abrupt wavy boundary.

Bs1—8 to 12 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure parting to weak fine granular; very friable; common fine and medium and few coarse roots; 10 percent dark reddish brown (5YR 3/4) and yellowish red (5YR

- 4/6) vertical columns of ortstein 18 to 20 inches apart and 2 to 3 inches wide; about 3 percent fine gravel; strongly acid; clear irregular boundary.
- Bs2—12 to 19 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure parting to weak fine granular; very friable; few fine and medium roots; 8 percent strong brown (7.5YR 4/6 and 5/8) vertical columns of ortstein 18 to 20 inches apart and $\frac{1}{2}$ to 1 inch wide; about 3 percent fine gravel; moderately acid; clear wavy boundary.
- BC—19 to 33 inches; light yellowish brown (10YR 6/4) sand; weak coarse subangular blocky structure; very friable; few fine and medium roots; about 5 percent fine and medium gravel; many fine prominent yellowish red (5YR 5/6 and 5/8) masses of iron accumulation in the matrix at a depth of about 22 inches; moderately acid; gradual wavy boundary.
- C1—33 to 54 inches; brown (10YR 5/3) sand; single grain; loose; about 3 percent fine and medium gravel; few coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; gradual wavy boundary.
- C2—54 to 80 inches; light brownish gray (10YR 6/2) sand; single grain; loose; about 3 percent fine and medium gravel; slightly acid.

The depth to the C horizon ranges from 20 to 45 inches. The content of gravel ranges from 0 to 10 percent throughout the profile. The depth to redoximorphic features ranges from 24 to 40 inches. The texture is sand throughout the profile.

The A horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 or 2.

The Bs1 horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 4 to 6. The Bs2 horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4 to 6. The Bs horizon is 0 to 20 percent weakly cemented ortstein fragments.

The BC horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 4 to 6.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 6. It has lenses of coarse sand in some pedons.

Cublake Series

The Cublake series consists of moderately well drained soils on outwash plains and lake plains. These soils formed in sandy materials over stratified loamy and silty deposits. Permeability is rapid in the sandy material and moderately slow in the loamy deposits. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy, mixed, frigid Oxyaquic Haplorthods

Typical pedon of Cublake sand, 0 to 6 percent slopes, 2,240 feet north and 100 feet east of the southwest corner of sec. 7, T. 24 N., R. 9 E., Oscoda Township, Iosco County, Michigan; USGS Foote Site Village, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 29 minutes 18 seconds N. and long. 83 degrees 23 minutes 57 seconds W., NAD 27:

- A—0 to 3 inches; black (N 2.5/) sand, very dark gray (10YR 3/1) dry; weak fine granular structure; very friable; many fine and very fine and few medium and coarse roots; extremely acid; abrupt smooth boundary.
- E—3 to 5 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak fine granular structure; very friable; common fine and very fine and few medium and coarse roots; very strongly acid; abrupt smooth boundary.
- Bs—5 to 10 inches; brown (7.5YR 4/3) sand; weak fine and medium subangular blocky structure; very friable; common fine and very fine and few medium and coarse roots; very strongly acid; clear wavy boundary.

- Bw1—10 to 13 inches; dark yellowish brown (10YR 4/6) sand; weak fine and medium subangular blocky structure; very friable; common fine and very fine and few medium and coarse roots; very strongly acid; clear wavy boundary.
- Bw2—13 to 24 inches; brownish yellow (10YR 6/6) sand; single grain; loose; common fine and very fine and few medium and coarse roots; extremely acid; clear wavy boundary.
- C1—24 to 31 inches; pale brown (10YR 6/3) sand; single grain; loose; few fine roots; common medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; extremely acid; clear wavy boundary.
- C2—31 to 45 inches; very pale brown (10YR 7/4) sand; single grain; loose; common fine and medium prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; very strongly acid; abrupt smooth boundary.
- 2C3—45 to 80 inches; brown (10YR 5/3), stratified very fine sandy loam and silt loam; weak thick platy structure parting to moderate fine angular blocky; friable; common coarse faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent yellowish brown (10YR 5/8) and common medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; moderately acid.

The content of gravel ranges from 0 to 5 percent throughout the profile. The depth to redoximorphic concentrations ranges from 24 to 40 inches.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 or 1. It is sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 1 to 3. It is sand.

The Bs horizon has hue of 7.5YR and value and chroma of 3 or 4. It is sand.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sand.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 6. It is sand.

The 2C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 or 4. It is stratified very fine sandy loam and silt loam.

Dawson Series

The Dawson series consists of very poorly drained soils in depressions on outwash plains. These soils formed in organic materials over sandy deposits. Permeability is moderately slow to moderately rapid in the organic material and rapid in the underlying sandy material. Slopes range from 0 to 2 percent.

Taxonomic classification: Sandy or sandy-skeletal, mixed, dysic, frigid Terric Haplosaprists

Typical pedon of Dawson peat, in an area of Dawson-Loxley peats, 2,508 feet north and 1,716 feet west of the southeast corner of sec. 35, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle: lat. 44 degrees 46 minutes 32.29 seconds N. and long. 84 degrees 16 minutes 45.58 seconds W., NAD 27:

- Oi—0 to 4 inches: peat, reddish brown (2.5YR 5/4) broken face and rubbed; 100 percent fiber, about 90 percent rubbed; very friable; many fine and medium and common coarse roots; extremely acid; abrupt wavy boundary.
- Oe—4 to 9 inches; mucky peat, very dark brown (10YR 2/2) broken face, black (10YR 2/1) rubbed; about 40 percent fiber, 25 percent rubbed; very friable; common fine and medium and few coarse roots; extremely acid; abrupt smooth boundary.

- Oa1—9 to 15 inches; muck, very dark brown (7.5YR 2.5/2) broken face, black (7.5YR 2.5/1) rubbed; about 15 percent fiber, 1 percent rubbed; moderate fine subangular blocky structure parting to moderate fine granular; very friable; few thin layers of black (N 2.5/) charcoal fragments; ultra acid; clear smooth boundary.
- Oa2—15 to 32 inches; muck, very dark gray (10YR 3/1) broken face, very dark gray (10YR 3/1) rubbed; about 5 percent fiber, 2 percent rubbed; weak fine granular structure; very friable; few thin layers of black (N 2.5/) charcoal fragments; extremely acid; abrupt smooth boundary.
- C1—32 to 41 inches; dark brown (7.5YR 3/2) sand; weak medium subangular blocky structure; very friable; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; extremely acid; clear wavy boundary.
- C2—41 to 80 inches; brown (10YR 5/3) sand; single grain; loose; extremely acid.

The thickness of the organic material ranges from 16 to 51 inches.

The Oi horizon is predominantly peat. The unrubbed fiber content ranges from 85 to 95 percent.

The Oa horizon has hue of 2.5YR or 5YR, value of 2 or 3, and chroma of 1 or 2. It is predominantly muck. The unrubbed fiber content ranges from 30 to 75 percent.

The C horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. It is sand. The content of gravel ranges from 0 to 3 percent.

Deerheart Series

The Deerheart series consists of poorly drained soils on lake plains (fig. 16). These soils formed in silty and loamy materials over stratified silty and loamy deposits. Permeability is slow. Slopes range from 0 to 2 percent.

Taxonomic classification: Fine-loamy, mixed, semiactive, nonacid, frigid Aeric Endoaquepts

Typical pedon of Deerheart silt loam, in an area of Bowers-Deerheart complex, 0 to 3 percent slopes, 750 feet north and 800 feet east of the southwest corner of sec. 15, T. 25 N., R. 2 W., South Branch Township, Crawford County, Michigan; USGS Roscommon North, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 33 minutes 32.78 seconds N. and long. 84 degrees 32 minutes 45.51 seconds W., NAD 27:

- Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium subangular blocky structure; friable; many fine and common medium roots; about 1 percent fine gravel; many fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.
- Bg—6 to 27 inches; gray (10YR 5/1) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common fine and few medium roots; few distinct dark grayish brown (10YR 4/2) clay films in root channels; about 1 percent fine gravel; common fine distinct gray (5Y 5/1) iron depletions in the matrix; many fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
- BC—27 to 43 inches; light olive brown (2.5Y 5/4) silty clay loam with thin strata of silt and silt loam; moderate medium and coarse subangular blocky structure; firm; common prominent greenish gray (5GY 5/1) gley coatings on faces of peds and along fracture planes; about 10 percent light gray (10YR 7/1) carbonate accumulations along faces of peds; about 1 percent fine gravel; common coarse distinct light brownish gray (10YR 6/2) iron depletions in the matrix; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.



Figure 16.—A profile of Deerheart loam. The water table is within a depth of 1 foot for much of the year. Depth is marked in feet.

C—43 to 80 inches; brown (10YR 5/3) silty clay loam stratified with light olive brown (2.5Y 5/4) very fine sandy loam, silt, and silt loam; massive; firm; about 1 percent fine and medium gravel; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; many coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 20 to 35 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly silt loam, but the range includes loam and silty clay loam. Pedons in undisturbed areas have a thin O horizon overlying an A horizon.

The Bg horizon has hue of 10YR to 5G, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam or clay loam.

The BC horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 2 to 4. It is dominantly silty clay loam or clay loam with thin strata of clay, silt, silt loam, or very fine sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 1 to 4. It is dominantly silty clay loam or clay loam with strata of loamy very fine sand, very fine sandy loam, silt, silt loam, and clay.

Deford Series

The Deford series consists of poorly drained soils on outwash plains and lake plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 2 percent.

Taxonomic classification: Mixed, frigid, Typic Psammaquents

Typical pedon of Deford muck, in an area of Deford-Au Gres-Croswell complex, 0 to 6 percent slopes, 2,375 feet west and 2,100 feet north of the southeast corner of sec. 30, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 42 minutes 07.55 seconds N. and long. 84 degrees 14 minutes 28.48 seconds W., NAD 27:

- Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.
- Oa—1 to 4 inches; muck, black (10YR 2/1) broken face and rubbed; about 15 percent fiber, less than 1 percent rubbed; weak medium granular structure; very friable; many very fine, fine, medium, and coarse roots; strongly acid; abrupt smooth boundary.
- Bw1—4 to 15 inches; light yellowish brown (2.5Y 6/3) sand; weak medium and coarse subangular blocky structure; very friable; few very fine, fine, medium, and coarse roots; about 3 percent gravel; many fine distinct light olive brown (2.5Y 5/6), many fine prominent yellowish brown (10YR 5/6 and 5/8), and common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
- Bw2—15 to 22 inches; light olive brown (2.5Y 5/3) sand; weak medium subangular blocky structure; very friable; few very fine and fine roots; about 3 percent gravel; many fine distinct light olive brown (2.5Y 5/6), many fine prominent yellowish brown (10YR 5/6 and 5/8), and common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
- C1—22 to 29 inches; light olive brown (2.5Y 5/4) sand; single grain; loose; about 10 percent gravel; few fine prominent yellowish brown (10YR 5/8) and few fine distinct yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
- C2—29 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; about 10 percent gravel; slightly acid.

The content of gravel ranges from 0 to 10 percent throughout the mineral part of the profile.

The Oa horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly muck. Some pedons have an A horizon of mucky sand below the O horizon.

The Bw horizon has hue of 2.5Y, value of 5 or 6, and chroma of 3. It is sand.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is sand.

Durkeelake Series

The Durkeelake series consists of moderately well drained soils on outwash plains and lake plains. These soils formed in sandy material over loamy and silty deposits. Permeability is rapid in the upper sandy material and moderate or moderately slow in the lower loamy material. Slopes range from 0 to 12 percent.

Taxonomic classification: Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs

Typical pedon of Durkeelake sand, 0 to 6 percent slopes, 800 feet south and 2,500 feet west of the northeast corner of sec. 8, T. 27 N., R. 1 E., south part of Greenwood Township, Oscoda County, Michigan; USGS Red Oak, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 45 minutes 05.01 seconds N. and long. 84 degrees 20 minutes 35.28 seconds W., NAD 27:

- Oa—0 to 3 inches; well decomposed forest litter; 25 percent uncoated sand grains; abrupt smooth boundary.
- E—3 to 9 inches; pinkish gray (7.5YR 6/2) sand, light gray (10YR 7/2) dry; weak fine subangular blocky structure; very friable; common very fine to coarse roots; about 3 percent gravel; strongly acid; abrupt wavy boundary.
- Bw1—9 to 13 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; common very fine and fine and few medium and coarse roots; about 5 percent gravel and 1 percent cobbles; moderately acid; clear wavy boundary.
- Bw2—13 to 25 inches; strong brown (7.5YR 5/6 and 5/8) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine roots; about 12 percent gravel and 1 percent cobbles; moderately acid; abrupt wavy boundary.
- 2B/E—25 to 31 inches; about 54 percent brown (7.5YR 4/4) silty clay loam (Bt); surrounded by light brownish gray (10YR 6/2) loamy fine sand, light gray (10YR 7/2) dry (E); moderate coarse subangular blocky structure; friable; common very fine and fine and few medium roots; few prominent brown (7.5YR 4/4) clay films on faces of peds; few black (7.5YR 2.5/1) root channels; about 2 percent gravel; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.
- 2BC—31 to 33 inches; yellowish brown (10YR 5/4) silt loam; weak coarse subangular blocky structure; friable; few very fine, fine, and coarse roots; very few prominent brown (7.5YR 4/4) clay films on faces of peds; few black (7.5YR 2.5/1) root channels; about 2 percent gravel; few fine prominent light greenish gray (10GY 7/1) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; neutral; clear wavy boundary.
- 2C—33 to 80 inches; stratified, light olive brown (2.5Y 5/4) silt loam and silty clay loam and yellowish brown (10YR 5/4) very fine sandy loam; massive; firm; some thin bands of yellowish brown (10YR 5/6) fine sand; few fine pink (7.5YR 7/3) carbonate coatings; about 1 percent gravel; common fine prominent light greenish gray (10GY 7/1) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; violently effervescent; moderately alkaline.

The thickness of the sandy material ranges from 20 to 50 inches. The depth to the base of the argillic horizon ranges from 30 to more than 65 inches. The depth to redoximorphic features ranges from 24 to 34 inches. The content of gravel ranges from 0 to 12 percent throughout the profile. The content of cobbles ranges from 0 to 2 percent throughout the profile.

Some pedons have an A horizon. This horizon, if it occurs, has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is sand. Reaction is strongly acid or moderately acid.

The E horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 2. It is sand. Reaction is strongly acid or moderately acid.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. Hue of 7.5YR and value and chroma of 4 do not occur together. This horizon is sand. Reaction ranges from strongly acid to slightly acid.

The B part of the 2B/E horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. It is silty clay loam, clay loam, or sandy clay loam. The E part of the 2B/E horizon has hue of 10YR, value of 5 or 6, and chroma of 2. It is loamy fine sand or very fine sandy loam. Reaction ranges from strongly acid to slightly acid. Some pedons have a 2E/B horizon above the 2B/E horizon. Some pedons have a 2Bt horizon, which has colors, textures, and reaction similar to those of the B part of the 2B/E horizon.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 to 6. It is stratified silty clay loam, silt loam, very fine sandy loam, or loamy very fine sand. Reaction is slightly alkaline or moderately alkaline.

Endoaquods

Endoaquods are 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.

Taxonomic classification: Mixed, frigid Endoaquods

Reference pedon of Endoaquods, wet, nearly level, 800 feet west of the southeast corner of sec. 34, T. 27 N., R. 4 E., east part of Comins Township, Oscoda County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 55 seconds N. and long. 83 degrees 55 minutes 56 seconds W., WGS 84:

- Oi—0 to 1 inch; undecomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- A—1 to 2 inches; black (10YR 2/1) sand, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; very friable; few medium and coarse and many very fine and fine roots; strongly acid; abrupt irregular boundary.
- E—2 to 8 inches; dark grayish brown (10YR 4/2) sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; strongly acid; abrupt irregular boundary.
- Bs1—8 to 13 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; friable; common fine distinct yellowish red (5YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear smooth boundary.
- Bs2—13 to 19 inches; dark yellowish brown (10YR 3/6) sand; weak coarse subangular blocky structure; very friable; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly acid; gradual wavy boundary.
- C1—19 to 48 inches; yellowish brown (10YR 5/8) sand; single grain; loose; about 14 percent gravel; neutral; clear wavy boundary.
- C2—48 to 80 inches; olive brown (2.5Y 4/4) sand; single grain; loose; about 14 percent gravel; neutral.

The content of gravel ranges from 0 to 14 percent.

Some pedons have an organic surface layer that is dominantly muck or mucky peat. This layer is 4 to 7 inches thick. It has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The A horizon has hue of 10YR, value of 2, and chroma of 1. It is sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 or 2. It is sand, loamy sand, or fine sand.

The Bs horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 4 to 6. It is sand, loamy sand, or fine sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is sand, loamy sand, or fine sand.

Entic Haplorthods, sandy

Entic Haplorthods are excessively drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Sandy, mixed, frigid Entic Haplorthods

Reference pedon of Entic Haplorthods, sandy, in an area of Entic Haplorthods, sandy-Alfic Haplorthods, sandy, complex, rolling, 10 feet south and 500 feet west of the northeast corner of sec. 22, T. 26 N., R. 5 E., Mitchell Township, Alcona County, Michigan; USGS Curran, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 38 minutes 18 seconds N. and long. 83 degrees 48 minutes 31 seconds W., WGS 84:

- Oe—0 to 1 inch; partially decomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- A—1 to 3 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; many very fine and fine roots; strongly acid; clear wavy boundary.
- E—3 to 7 inches; brown (7.5YR 5/3) sand, pinkish gray (7.5YR 6/2) dry; weak fine granular structure; very friable; many very fine, common fine, and few medium roots; strongly acid; clear wavy boundary.
- Bs1—7 to 11 inches; brown (7.5YR 4/4) sand; weak medium granular structure; very friable; many fine and few medium and coarse roots; strongly acid; clear smooth boundary.
- Bs2—11 to 23 inches; strong brown (7.5YR 4/6) sand; weak medium granular structure; very friable; common fine and medium and few coarse roots; strongly acid; clear smooth boundary.
- BC—23 to 30 inches; brownish yellow (10YR 6/6) sand; weak fine subangular blocky structure; strongly acid; gradual smooth boundary.
- C1—30 to 66 inches; very pale brown (10YR 7/4) sand; single grain; loose; few medium roots; moderately acid; gradual wavy boundary.
- C2—66 to 180 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; moderately acid.

The depth to the C horizon ranges from 20 to 50 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand and loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4. It has textures similar to those of the A horizon.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is sand, loamy sand, or fine sand.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 6. It is sand or coarse sand.

A banded, loamy and fine-loamy substratum phase is recognized. A very deep water table phase also is recognized.

Fluvaquents

Fluvaquents are very poorly drained soils on flood plains. These soils formed in sandy deposits. Permeability is rapid or moderately rapid in the upper part and moderately slow in the lower part. Slopes range from 0 to 2 percent.

Taxonomic classification: Fluvaquents

Reference pedon of Fluvaquents, in an area of Endoaquods-Fluvaquents, occasionally flooded, complex, 1,700 feet south and 270 feet west of the northeast corner of sec. 12, T. 26 N., R. 4 E., Mentor Township, Oscoda County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 39 minutes 44.57 seconds N. and long. 83 degrees 53 minutes 24 seconds W., WGS 84:

- Oe—0 to 1 inch; partially decomposed herbaceous material; abrupt smooth boundary.
- Oa—1 to 6 inches; muck, black (N 2.5/) broken face and rubbed; about 8 percent fiber,

1 percent rubbed; weak very fine subangular blocky structure; very friable; many very fine to medium roots; neutral; abrupt smooth boundary.

A—6 to 19 inches; dark yellowish brown (10YR 4/4) loamy sand; weak medium subangular blocky structure; friable; many very fine and few fine roots; bands of black (10Y 2/1) mucky sand decreasing with depth; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.

C1—19 to 34 inches; dark yellowish brown (10YR 4/4) gravelly loamy sand; weak medium subangular blocky structure; friable; few fine roots; 20 percent gravel; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; diffuse wavy boundary.

C2—34 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; neutral.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 4. It is muck, mucky sand, mucky loamy sand, mucky loamy fine sand, sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam. The horizon is stratified in some pedons. The content of gravel ranges from 0 to 14 percent.

The C horizon has hue of 2.5YR to 5Y, value of 4 to 6, and chroma of 1 to 6. It is sand, gravelly sand, fine sand, loamy sand, or gravelly loamy sand. The content of gravel ranges from 0 to 20 percent.

Some pedons have a 2C horizon. This horizon, if it occurs, is sandy loam, gravelly sandy loam, fine sandy loam, loam, silt loam, clay loam, or silty clay loam. The content of gravel ranges from 0 to 20 percent.

Gerrish Series

The Gerrish series consists of somewhat excessively drained soils on outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 6 percent.

Taxonomic classification: Mixed, frigid Lamellic Udipsamments

Typical pedon of Gerrish sand, in an area of Gerrish-Grayling sands, 0 to 6 percent slopes, 2,710 feet west and 200 feet north of the southeast corner of sec. 31, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 10.27 seconds N. and long. 84 degrees 21 minutes 52.29 seconds W., NAD 27:

Oe—0 to 2 inches; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.

A—2 to 4 inches; dark brown (10YR 3/3) sand, brown (10YR 5/3) dry; weak fine granular structure; very friable; many very fine and fine and common medium roots; about 3 percent gravel; strongly acid; abrupt wavy boundary.

Bw1—4 to 10 inches; strong brown (7.5YR 4/6) sand; weak fine subangular blocky structure; very friable; common very fine, fine, and medium roots; about 3 percent gravel and 10 percent cobbles; moderately acid; clear wavy boundary.

Bw2—10 to 21 inches; strong brown (7.5YR 5/6) gravelly sand; weak fine subangular blocky structure; very friable; common very fine and fine and few medium roots; about 20 percent gravel and 5 percent cobbles; moderately acid; clear wavy boundary.

E and Bt—21 to 60 inches; light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/4) dry; weak medium and coarse subangular blocky structure; very friable (E); lamellae ($\frac{1}{4}$ to $\frac{1}{2}$ inch thick) of strong brown (7.5YR 5/6) loamy sand (Bt); the total accumulation of lamellae is less than 4 inches thick; many strong brown

(7.5YR 5/6) clay bridges between sand grains; weak medium and coarse subangular blocky structure; very friable; few very fine and fine roots; about 3 percent gravel and 1 percent cobbles; neutral; clear wavy boundary.

C—60 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 7 percent gravel and 1 percent cobbles; 4-inch stratum of gravelly sand (about 33 percent gravel and 7 percent cobbles); strongly effervescent; moderately alkaline.

The depth to the lamellae ranges from 20 to more than 40 inches. The content of gravel ranges from 0 to 20 percent in the A horizon and the upper part of the Bw horizon, from 15 to 35 percent in the lower part of the Bw horizon, and from 0 to 14 percent in the E and Bt horizon and the C horizon. The content of cobbles ranges from 0 to 15 percent in the Bw horizon and from 0 to 3 percent in the E and Bt horizon.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3. It is sand.

Some pedons have an E horizon. This horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. It is sand or gravelly sand.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is dominantly sand or gravelly sand, but the range includes very gravelly sand and cobbly sand.

The E part of the E and Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. The Bt part has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The Bt part is loamy sand or sandy loam.

The C horizon has hue of 10YR, value of 6, and chroma of 4. It is sand with stratified layers of gravel. Some pedons do not have a C horizon.

Glennie Series

The Glennie series consists of moderately well drained soils on ground moraines. These soils formed in loamy deposits. Permeability is moderately rapid in the upper part of the profile and very slow in the lower part. Slopes range from 0 to 12 percent.

Taxonomic classification: Coarse-loamy, mixed, semiactive, frigid Oxyaquic Fraglossudalfs

Typical pedon of Glennie loamy sand, 0 to 6 percent slopes, 1,850 feet south and 1,848 feet west of the northeast corner of sec. 13, T. 25 N., R. 6 E., Curtis Township, Alcona County, Michigan; USGS Glennie, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 33 minutes 47.75 seconds N. and long. 83 degrees 39 minutes 08.98 seconds W., NAD 27:

Oe—0 to 2 inches; partially decomposed forest litter; abrupt smooth boundary.

A—2 to 3 inches; black (10YR 2/1) loamy sand, very dark gray (10YR 3/1) dry; weak fine granular structure; friable; many fine roots; about 5 percent gravel; neutral; abrupt smooth boundary.

E—3 to 7 inches; grayish brown (10YR 5/2) loamy sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; friable; common fine and medium roots; about 5 percent gravel; slightly acid; abrupt broken boundary.

Bt1—7 to 11 inches; dark brown (7.5YR 3/4) sandy loam; moderate medium subangular blocky structure; friable; many fine roots; clay films and bridging of sand grains; about 5 percent gravel and 1 percent cobbles; neutral; abrupt broken boundary.

Bt2—11 to 20 inches; strong brown (7.5YR 4/6) loamy sand; weak medium subangular blocky structure; friable; common fine roots; clay coatings and bridging of sand grains; about 5 percent gravel; neutral; clear wavy boundary.

(E/B)x—20 to 40 inches; about 60 percent brown (10YR 5/3) loamy sand, very pale brown (10YR 7/3) dry (E); surrounding peds of reddish brown (5YR 5/3) loam (Bt);

massive; firm; brittle; few fine roots in cracks; about 5 percent gravel; neutral; clear irregular boundary.

(B/E)x—40 to 46 inches; about 70 percent reddish brown (5YR 4/4) sandy clay loam (Bt); few faint dark reddish brown (5YR 3/4) clay films; surrounded by brown (10YR 5/3) sandy loam, very pale brown (10YR 7/3) dry (E); weak thick platy structure; very firm; brittle; common fine roots in cracks; about 5 percent gravel; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear irregular boundary.

B't1—46 to 56 inches; dark reddish brown (5YR 3/4) clay; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation; weak medium prismatic structure parting to moderate medium angular blocky; very firm; common fine roots between peds; many faint dark reddish brown (5YR 3/4) clay films on vertical faces of peds; about 5 percent gravel; neutral; clear irregular boundary.

B't2—56 to 80 inches; reddish brown (5YR 4/4) sandy clay loam; weak medium angular blocky structure; very firm; common faint dark reddish brown (5YR 3/4) clay films on faces of peds; about 8 percent gravel; slight effervescence; slightly alkaline.

Depth to the fragipan is about 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 7 percent.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. Pedons in cultivated areas have an Ap horizon, which is 6 to 9 inches thick. This horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 5 or 6 and chroma of 0 to 3.

The Bt horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam or loamy sand.

The E part of the (E/B)x and (B/E)x horizons has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4. It is loamy sand or sandy loam. The Bt part of the (E/B)x and (B/E)x horizons has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is loam or sandy clay loam.

The B't horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is clay loam, sandy clay loam, or clay.

The Cd horizon, if it occurs, has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is sandy clay loam, clay loam, or loam.

Glossudalfs

Glossudalfs are well drained soils on moraines. These soils formed in loamy and sandy deposits. Permeability is moderate. Slopes range from 0 to 45 percent.

Taxonomic classification: Mixed, frigid Glossudalfs

Reference pedon of Glossudalfs, 2,640 feet north and 1,240 feet west of the southeast corner of sec. 8, T. 25 N., R. 6 E., Curtis Township, Alcona County, Michigan; USGS Glennie, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 34 minutes 30 seconds N. and long. 83 degrees 44 minutes 31 seconds W., WGS 84:

A—0 to 3 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; common very fine and fine and few medium roots; slightly acid; abrupt irregular boundary.

E/B—3 to 12 inches; about 70 percent brown (7.5YR 5/2) loamy sand (E), light brownish gray (10YR 6/2) dry; surrounded by brown (7.5YR 4/4) loamy sand (Bt);

weak medium subangular blocky structure; friable; common very fine, fine, and medium roots; slightly acid; clear wavy boundary.

B/E—12 to 29 inches; about 60 percent reddish brown (5YR 4/4) sandy clay loam (Bt); surrounded by brown (7.5YR 5/4) sandy loam (E), light brown (7.5YR 6/4) dry; moderate medium subangular blocky structure; friable; common very fine, fine, and medium roots; slightly acid; abrupt wavy boundary.

BC—29 to 43 inches; brown (7.5YR 4/4) loamy sand; weak medium granular structure; friable; few very fine, fine, and medium roots; slightly acid; clear wavy boundary.

C1—43 to 58 inches; reddish brown (5YR 4/4) loamy sand; weak fine granular structure; friable; few very fine, fine, and medium roots; slightly acid; clear wavy boundary.

C2—58 to 84 inches; stratified, reddish brown (5YR 4/4) loamy sand and yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable; few fine and medium roots; slightly alkaline.

The depth to the C horizon ranges from 20 to 50 inches. The content of gravel ranges from 0 to 14 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. It is dominantly sandy loam, but the range includes loamy sand.

Some pedons have a Bw horizon. This horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is sandy loam or loamy sand.

The E part of the B/E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. It is sandy loam or loamy sand. The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4. They are sandy clay loam, sandy loam, loam, or clay loam.

The C horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 4 to 6. It is loamy sand, sandy loam, loam, sandy clay loam, or clay loam. It is commonly stratified.

Graycalm Series

The Graycalm series consists of somewhat excessively drained soils on outwash plains and moraines (fig. 17). These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 70 percent.

Taxonomic classification: Mixed, frigid Lamellic Udipsamments

Typical pedon of Graycalm sand, in an area of Graycalm-Grayling sands, 0 to 6 percent slopes, 1,320 feet west and 25 feet north of the southeast corner of sec. 36, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 07.55 seconds N. and long. 84 degrees 15 minutes 27.99 seconds W., NAD 27:

Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.

A—1 to 2 inches; black (10YR 2/1) sand, black (10YR 2/1) dry; weak fine granular structure; very friable; many fine and common medium and coarse roots; extremely acid; abrupt smooth boundary.

E—2 to 3 inches; grayish brown (10YR 5/2) sand, gray (10YR 6/1) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; many fine and common medium and coarse roots; very strongly acid; abrupt broken boundary.

Bw1—3 to 7 inches; dark yellowish brown (10YR 4/4) sand; weak medium subangular blocky structure parting to weak fine granular; very friable; common fine and few



Figure 17.—A profile of Graycalm sand. This soil is similar to Grayling sand but has thin lamellae in the lower part of the subsoil below a depth of 2 feet. Depth is marked in feet.

medium and coarse roots; about 2 percent fine and medium gravel; moderately acid; clear wavy boundary.

Bw2—7 to 17 inches; dark yellowish brown (10YR 4/6) sand; weak medium and coarse subangular blocky structure; very friable; common fine and medium and few coarse roots; about 2 percent fine and medium gravel; moderately acid; gradual wavy boundary.

Bw3—17 to 24 inches; yellowish brown (10YR 5/4) sand; weak coarse subangular blocky structure parting to weak fine and medium subangular blocky; very friable; common fine and few medium roots; about 3 percent fine and medium gravel and 1 percent cobbles; moderately acid; clear wavy boundary.

E and Bt—24 to 80 inches; brown (10YR 5/3) sand (E); very weak medium subangular blocky structure; very friable; lamellae ($\frac{1}{8}$ to 1 inch thick) of brown (7.5YR 4/4) and strong brown (7.5YR 4/6) loamy sand (Bt); the total accumulation of the lamellae is less than 4 inches thick; clay bridging between sand grains; moderate very fine and medium subangular blocky structure; friable; few fine roots in the upper part of the horizon; about 1 percent fine and medium gravel; slightly acid.

The depth to the E and Bt horizon ranges from 25 to 42 inches. The content of gravel ranges from 0 to 14 percent throughout the profile. The content of cobbles ranges from 0 to 3 percent.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. It is sand.

The E horizon has hue of 7.5YR, value of 5 or 6, and chroma of 1 to 3. This horizon has a broken boundary. It is sand. Some pedons do not have an E horizon.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. It is sand.

The E part of the E and Bt horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 2 to 6. It is sand. The Bt part of the E and Bt horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sandy loam. It consists of lamellae $\frac{1}{16}$ inch to 3 inches thick. The total accumulation within a depth of 60 inches is less than 6 inches.

Grayling Series

The Grayling series consists of excessively drained soils on outwash plains and moraines (fig. 18). These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Mixed, frigid Typic Udipsamments

Typical pedon of Grayling sand, 0 to 6 percent slopes, 1,020 feet north and 2,740 feet east of the southwest corner of sec. 6, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Oak Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 45 minutes 22.85 seconds N. and long. 84 degrees 14 minutes 27.68 seconds W., NAD 27:

Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.

A—1 to 2 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak fine granular; very friable; many fine and medium and common coarse roots; about 3 percent fine gravel; very strongly acid; abrupt smooth boundary.

Bw1—2 to 7 inches; brown (10YR 4/3) sand; weak medium subangular blocky structure parting to weak fine granular; very friable; common fine and medium and few coarse roots; about 3 percent fine gravel; strongly acid; clear wavy boundary.

Bw2—7 to 15 inches; dark yellowish brown (10YR 4/6) sand; weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots; about 5 percent fine and medium gravel; strongly acid; clear wavy boundary.

BC—15 to 23 inches; yellowish brown (10YR 5/6) sand; weak medium subangular blocky structure parting to weak fine granular; very friable; few medium and coarse roots; about 5 percent fine and medium gravel; moderately acid; gradual wavy boundary.

C—23 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; slightly acid.

The depth to the C horizon ranges from 15 to 32 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is sand.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. It is sand.

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



Figure 18.—A profile of Grayling sand. This soil has a relatively thin solum and generally does not have an E horizon. Depth is marked in feet.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is sand or coarse sand. Some pedons have thin layers of gravelly sand. A banded substratum phase is recognized; the bands occur below a depth of 80 inches.

Haplosaprists, dysic

Haplosaprists are very poorly drained soils on lake plains, outwash plains, and moraines. These soils formed in organic deposits. Permeability ranges from moderately rapid to moderately slow. Slopes range from 0 to 2 percent.

Taxonomic classification: Mixed, dysic, frigid Haplosaprists

Reference pedon of Haplosaprists, dysic, 550 feet north and 1,350 feet east of the southeast corner of sec. 16, T. 25 N., R. 4 W., Mentor Township, Oscoda County, Michigan; USGS Goodar, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 32 minutes 53.03 seconds N. and long. 83 degrees 57 minutes 18.16 seconds W., WGS 84:

- Oi1—0 to 2 inches; mossy peat, light olive brown (2.5YR 5/6) broken face and rubbed; 100 percent fibers; many very fine and fine roots; extremely acid; abrupt smooth boundary.
- Oi2—2 to 8 inches; mossy peat, dark yellowish brown (10YR 4/6) broken face and very dark brown (7.5YR 2.5/3) rubbed; about 90 percent fibers, 60 percent rubbed; strong thin platy structure; very friable; many very fine and fine roots; extremely acid; abrupt smooth boundary.
- Oa1—8 to 12 inches; muck, reddish black (10R 2.5/1) broken face and black (10YR 2/1) rubbed; about 60 percent fibers, 20 percent rubbed; strong very thick platy structure; very friable; many very fine and fine roots; contains 5 to 10 percent partially decomposed woody materials; extremely acid; diffuse smooth boundary.
- Oa2—12 to 36 inches; muck, reddish black (10R 2.5/1) broken face and black (10YR 2/1) rubbed; about 50 percent fibers, 5 percent rubbed; strong very thick platy structure; very friable; many very fine and fine roots to a depth of 20 inches; contains 5 to 10 percent partially decomposed woody materials; very strongly acid; diffuse smooth boundary.
- Oa3—36 to 80 inches; muck, reddish black (10R 2.5/1) broken face and black (10YR 2/1) rubbed; about 30 percent fibers, less than 5 percent rubbed; strong very thick platy structure; very friable; contains 5 percent partially decomposed woody materials; very strongly acid; diffuse smooth boundary.

The thickness of the organic materials ranges from 16 to more than 80 inches. The texture of the surface layer is typically peat. The subsurface layers are dominantly muck.

The organic layers have hue of 10R to 10YR, value of 2 to 4, and chroma of 1 to 4. The mineral layers have hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 3. Textures range from sand to sandy clay loam.

Haplosaprists, euic

Haplosaprists are very poorly drained soils on lake plains, outwash plains, and moraines. These soils formed in organic deposits. Permeability ranges from moderately rapid to moderately slow. Slopes range from 0 to 2 percent.

Taxonomic classification: Mixed, euic, frigid Haplosaprists

Reference pedon of Haplosaprists, euic, 140 feet north and 2,340 feet east of the southwest corner of sec. 21, T. 26 N., R. 1 W., South Branch Township, Crawford County, Michigan; USGS Luzerne Northwest, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 06 seconds N. and long. 84 degrees 23 minutes 02 seconds W., WGS 84:

- Oe1—0 to 7 inches; mucky peat, dark reddish brown (5YR 3/3) broken face and rubbed; about 75 percent fibers, 25 percent rubbed; weak thick platy structure; very friable; extremely acid; gradual smooth boundary.
- Oe2—7 to 13 inches; mucky peat, dark reddish brown (5YR 3/3 and 3/2) broken face and rubbed; about 75 percent fibers, 25 percent rubbed; weak thick platy structure; very friable; extremely acid; gradual smooth boundary.
- Oa—13 to 25 inches; muck, dark reddish brown (5YR 2.5/2) broken face and rubbed; about 25 percent fibers, 10 percent rubbed; massive; friable; extremely acid; abrupt smooth boundary.
- Cg1—25 to 30 inches; dark grayish brown (10YR 4/2) sand; single grain; loose; strongly acid; clear smooth boundary.
- Cg2—30 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; strongly acid.

The thickness of the organic materials ranges from 16 to more than 50 inches.

The surface layer is typically muck or mucky peat. The subsurface layers are dominantly muck. The organic layers have hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 4.

The mineral substratum has hue of 5YR to 5Y, value of 5 or 6, and chroma of 1 to 3. Textures range from sand to sandy clay loam.

Histosols

Histosols are very poorly drained soils in depressions on kame moraines, lake plains, and outwash plains. These soils formed in organic deposits. Permeability ranges from moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Taxonomic classification: Histosols

Typical pedon of Histosols, in an area of Histosols and Aquents, ponded, 2,560 feet south and 10 feet east of the northwest corner of sec. 29, T. 26 N., R. 6 W., Garfield Township, Kalkaska County, Michigan; USGS Sharon, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 37 minutes 10 seconds N. and long. 85 degrees 04 minutes 53 seconds W., NAD 27:

Oa1—0 to 14 inches; muck, black (5YR 2.5/1) broken face and rubbed; about 15 percent fiber, less than 5 percent rubbed; weak coarse granular structure; friable; many fine and common medium roots; about 10 percent woody fragments; neutral; abrupt wavy boundary.

Oa2—14 to 80 inches; muck, black (N 2.5/) broken face and rubbed; about 3 percent fiber, less than 1 percent rubbed; weak thick platy structure; few fine roots; friable; neutral.

The thickness of the sapric material ranges from 16 to more than 51 inches. The content of woody fragments ranges from 0 to 15 percent.

The Oa horizon has hue of 5YR, value of 2.5 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2.5 or 3. Some pedons have an Oe horizon. This horizon is muck.

Horsehead Series

The Horsehead series consists of somewhat excessively drained soils on outwash plains, in glacial drainage channels, and on kames and moraines (fig. 19). These soils formed in gravelly and sandy deposits. Permeability is rapid or very rapid. Slopes range from 0 to 70 percent.

Taxonomic classification: Sandy-skeletal, mixed, frigid Arenic Hapludalfs

Typical pedon of Horsehead sand, in an area of Coppler-Horsehead sands, 0 to 6 percent slopes, 1,660 feet south and 1,975 feet west of the northeast corner of sec. 6, T. 28 N., R. 3 E., west part of Clinton Township, Oscoda County, Michigan; USGS Comins, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 51 minutes 01.34 seconds N. and long. 84 degrees 07 minutes 11.60 seconds W., NAD 27:

A—0 to 3 inches; black (10YR 2/1) sand, very dark gray (10YR 3/1) dry; weak fine granular structure; very friable; many very fine and fine and few medium and coarse roots; about 7 percent gravel; strongly acid; abrupt wavy boundary.

Bw1—3 to 11 inches; strong brown (7.5YR 4/6) gravelly sand; weak fine subangular blocky structure parting to weak fine granular; very friable; many very fine and fine and few medium and coarse roots; about 13 percent gravel and 2 percent cobbles; moderately acid; gradual wavy boundary.



Figure 19.—A profile of Horsehead sand. The upper part of the subsoil is weakly developed. The C horizon is below a depth of about 32 inches and consists of stratified very gravelly sand and sand. Depth is marked in inches.

- Bw2—11 to 23 inches; brown (7.5YR 5/4) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine roots; about 12 percent gravel and 2 percent cobbles; moderately acid; clear wavy boundary.
- 2Bt—23 to 36 inches; brown (7.5YR 4/4) very gravelly loamy sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine and few medium roots; common faint brown (7.5YR 4/4) clay bridges between sand grains; about 33 percent gravel and 2 percent cobbles; neutral; clear wavy boundary.
- 2C1—36 to 47 inches; light yellowish brown (10YR 6/4) very gravelly sand; single grain; loose; few very fine and fine roots; about 55 percent gravel and 5 percent cobbles; strongly effervescent; strongly alkaline; abrupt wavy boundary.
- 2C2—47 to 80 inches; light yellowish brown (10YR 6/4), stratified sand, very gravelly coarse sand, and very gravelly sand; single grain; loose; 50 percent gravel in layers, 27 percent gravel in the horizon; 3 percent cobbles; strongly effervescent; strongly alkaline.

The depth to carbonates typically is 23 to 39 inches but ranges from 20 to 45 inches. The content of gravel ranges from 0 to 55 percent throughout the profile, and the content of cobbles ranges from 0 to 20 percent. The content of stones ranges from 0 to 5 percent throughout the profile. In some pedons the content of gravel in the profile and in the substratum ranges up to 65 percent by volume. The content of rock fragments in thin subhorizons and lenses can range to as much as 90 percent by volume. The average content of rock fragments in the particle-size control section is 45 percent by volume.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is dominantly sand, but the range includes loamy sand.

Some pedons have an E horizon above the Bw horizon. This horizon, if it occurs, is 1 to 3 inches thick. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is sand or gravelly sand.

The Bw horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is dominantly sand or gravelly sand, but the range includes loamy sand and very gravelly sand.

The 2Bt horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 4 to 6. It is dominantly gravelly loamy sand or very gravelly loamy sand, but the range includes extremely gravelly loamy sand.

The 2C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6. It is stratified extremely gravelly sand, very gravelly coarse sand, very gravelly sand, gravelly sand, or sand.

losco Series

The losco series consists of somewhat poorly drained soils on ground moraines and lake plains. These soils formed in sandy material over loamy deposits. Permeability is rapid in the upper sandy layers and moderate or moderately slow in the underlying loamy layers. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy over loamy, mixed, active, frigid Argic Endoaquods

Typical pedon of losco sand, 0 to 6 percent slopes, 1,350 feet south and 1,000 feet west of the northeast corner of sec. 18, T. 31 N., R. 1 E., Vienna Township, Montmorency County, Michigan; USGS Hetherton, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 04 minutes 50 seconds N. and long. 84 degrees 21 minutes 09 seconds W., NAD 27:

A—0 to 3 inches; black (N 2.5/) sand, very dark gray (10YR 3/1) dry; moderate medium granular structure; friable; many very fine, fine, medium, and coarse roots; 30 percent uncoated sand grains; about 1 percent gravel; strongly acid; abrupt wavy boundary.

E—3 to 12 inches; pinkish gray (7.5YR 6/2) sand, light gray (10YR 7/2) dry; single grain; loose; common very fine and fine and few medium and coarse roots; about 1 percent gravel; strongly acid; abrupt smooth boundary.

Bhs—12 to 15 inches; dark reddish brown (5YR 3/2) sand; moderate medium subangular blocky structure; firm; few fragments of weakly cemented ortstein; about 1 percent gravel; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.

Bs—15 to 18 inches; strong brown (7.5YR 4/6) sand; moderate medium subangular blocky structure; firm; about 1 percent gravel; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly acid; abrupt wavy boundary.

- E'—18 to 20 inches; pale brown (10YR 6/3) loamy sand, light gray (10YR 7/2) dry; massive; firm; few fine and medium roots; about 2 percent gravel; neutral; abrupt irregular boundary.
- 2B/E—20 to 30 inches; about 75 percent reddish brown (5YR 4/4) sandy clay loam (Bt); surrounded by yellowish brown (10YR 5/4) loamy sand (E); moderate medium and coarse subangular blocky structure; firm; few fine and medium roots; about 2 percent gravel; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
- 2Bt—30 to 42 inches; reddish brown (5YR 4/4) sandy clay loam; moderate medium and coarse subangular blocky structure; firm; few fine and medium roots; about 2 percent gravel; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
- 2C—42 to 80 inches; brown (7.5YR 5/4) loam; massive; firm; few fine and medium roots; about 5 percent gravel; many medium distinct gray (7.5YR 6/1) iron depletions and many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline.

The depth to carbonates ranges from 34 to 48 inches. The content of gravel ranges from 0 to 14 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. It is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is sand.

The Bhs horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 2 or 3. It is sand. The Bs horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 4 to 6. It is sand.

The E' horizon and the E part of the B/E horizon have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. They are loamy sand or sand.

The 2Bt horizon and the Bt part of the B/E horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. They are sandy clay loam, clay loam, loam, or silty clay loam.

The 2C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 2 to 4. It is loam, sandy loam, clay loam, or silty clay loam.

Islandlake Series

The Islandlake series consists of somewhat excessively drained soils on kames, moraines, and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 35 percent.

Taxonomic classification: Sandy, mixed, frigid Lamellic Haplorthods

Typical pedon of Islandlake sand, 6 to 18 percent slopes, 2,300 feet north and 2,625 feet east of the southwest corner of sec. 24, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 43 minutes 00.40 second N. and long. 84 degrees 08 minutes 27.10 seconds W., NAD 27:

- Oe—0 to 2 inches; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.
- E—2 to 7 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 6/2) dry; weak fine and medium subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 2 percent gravel; strongly acid; abrupt wavy boundary.
- Bhs—7 to 10 inches; very dark brown (7.5YR 2.5/3) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine and few

medium and coarse roots; about 2 percent gravel; strongly acid; abrupt wavy boundary.

Bs1—10 to 18 inches; dark reddish brown (5YR 3/4) sand; weak fine and medium subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; columns (about 5 inches wide) of weakly cemented to noncemented dark brown (7.5YR 3/3) material from the Bhs horizon extend through this horizon; about 5 percent gravel and 1 percent cobbles; moderately acid; clear wavy boundary.

Bs2—18 to 27 inches; brown (7.5YR 5/4) sand; weak fine and medium subangular blocky structure; very friable; few very fine and fine roots; columns (about 5 inches wide) of weakly cemented to noncemented dark brown (7.5YR 3/3) Bhs material extend through the base of this horizon; about 12 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.

E and Bt—27 to 80 inches; light yellowish brown (10YR 6/4) sand (E), very pale brown (10YR 7/4) dry; weak medium and coarse subangular blocky structure; very friable; lamellae of strong brown (7.5YR 4/6) loamy sand (Bt); weak medium and coarse subangular blocky structure; very friable; few very fine, fine, medium, and coarse roots; lamellae are $\frac{1}{8}$ to 1 inch thick; common faint strong brown (7.5YR 4/6) clay bridges between sand grains in the lamellae; about 2 percent gravel and 1 percent cobbles; slightly acid.

The depth to the lamellae ranges from 25 to 43 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

Some pedons have an A horizon. This horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand or loamy sand.

The E horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 1 or 2. It is sand.

The Bhs horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 2 or 3. It is sand. The Bs horizon has hue of 7.5YR or 10YR, value of 4, and chroma of 4 to 6. It is sand.

The E part of the E and Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 or 4. It is sand. The Bt part of the E and Bt horizon has hue of 7.5YR, value of 4, and chroma of 4 to 6. It occurs as lamellae of loamy sand $\frac{1}{8}$ to 1 inch thick. The total accumulation is less than 6 inches thick.

Kawkawlin Series

The Kawkawlin series consists of somewhat poorly drained soils on till plains. These soils formed in loamy and clayey deposits. Permeability is slow. Slopes range from 1 to 4 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Aquic Glossudalfs

Typical pedon of Kawkawlin loam, 1 to 4 percent slopes, 340 feet south and 675 feet east of the northwest corner of sec. 15, T. 28 N., R. 8 E., Caledonia Township, Alcona County, Michigan; USGS Spruce, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 49 minutes 43.23 seconds N. and long. 83 degrees 27 minutes 45.12 seconds W., NAD 27:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; moderate medium subangular blocky structure; friable; about 5 percent gravel; neutral; abrupt smooth boundary.

B/E—10 to 13 inches; about 80 percent brown (7.5YR 4/4) clay loam (Bt); surrounded by brown (10YR 5/3) loam, very pale brown (10YR 7/3) dry (E); moderate medium subangular blocky structure; friable; common fine roots; few faint brown (7.5YR

- 4/4) clay films on faces of peds; common very dark grayish brown (10YR 3/2) wormcasts; about 5 percent gravel; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; abrupt broken boundary.
- Bt—13 to 16 inches; strong brown (7.5YR 4/6) clay loam; strong fine angular blocky structure; firm; many fine roots between peds; many distinct brown (7.5YR 5/2 and 4/4) clay films on faces of peds; many medium cylindrical wormcasts; about 5 percent gravel; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; many fine faint strong brown (7.5YR 5/6) iron accumulations in the matrix; neutral; clear smooth boundary.
- BC—16 to 30 inches; strong brown (7.5YR 4/6) clay loam; moderate medium angular blocky structure; friable; few fine roots between peds; about 5 percent gravel; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; many fine faint strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; abrupt smooth boundary.
- C—30 to 60 inches; reddish brown (5YR 5/3) clay loam; weak medium prismatic structure; very firm; about 5 percent gravel and 1 percent cobbles; common coarse prominent light greenish gray (5GY 7/1) iron depletions in the matrix; common coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 20 to 35 inches. The content of gravel ranges from 0 to 5 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The Ap horizon has hue of 10YR, value of 3, and chroma of 2.

The E part of the B/E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is loam. The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4, and chroma of 4 to 6. They are clay loam or clay.

The C horizon has hue of 5YR, value of 5 or 6, and chroma of 3. It is clay loam.

Kellogg Series

The Kellogg series consists of moderately well drained soils on lake plains. These soils formed in sandy material over clayey deposits. Permeability is rapid in the sandy material and slow or very slow in the underlying clayey material. Slopes range from 0 to 12 percent.

Taxonomic classification: Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods

Typical pedon of Kellogg sand, 0 to 6 percent slopes, 560 feet north and 50 feet west of the southeast corner of sec. 25, T. 27 N., R. 1 E., south part of Greenwood Township, Oscoda County, Michigan; USGS Red Oak, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 41 minutes 52.27 seconds N. and long. 84 degrees 15 minutes 06.2 seconds W., NAD 27:

- Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) sand, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure parting to weak fine granular; very friable; common very fine and medium and few coarse roots; about 1 percent gravel; moderately acid; abrupt wavy boundary.
- E—8 to 13 inches; pinkish gray (7.5YR 6/2) sand, pinkish white (7.5YR 8/2) dry; weak fine and medium subangular blocky structure; very friable; few very fine and medium and common fine roots; about 1 percent gravel; moderately acid; clear broken boundary.

- Bs1—13 to 17 inches; brown (7.5YR 4/4) sand; weak fine and medium subangular blocky structure; very friable; common very fine and fine and few medium and coarse roots; about 1 percent gravel; moderately acid; gradual wavy boundary.
- Bs2—17 to 26 inches; sand, 60 percent strong brown (7.5YR 4/6) and 40 percent strong brown (7.5YR 5/6); weak fine and medium subangular blocky structure; very friable; common very fine and fine and few medium roots; about 2 percent gravel; slightly acid; abrupt wavy boundary.
- 2B/E—26 to 28 inches; about 52 percent brown (7.5YR 5/3) clay loam and sandy loam (Bt); moderate medium and coarse subangular blocky structure; firm; surrounded by brown (10YR 5/3) loamy sand, very pale brown (10YR 7/3) dry (E); weak fine subangular blocky structure; very friable; few very fine and fine roots; few distinct brown (7.5YR 5/3) clay films on faces of peds; few very dark grayish brown (10YR 3/2) root channels; about 2 percent gravel and 1 percent cobbles; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
- 2Bt—28 to 34 inches; brown (7.5YR 4/3) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine and fine and few medium roots; few prominent brown (7.5YR 5/3) and common distinct brown (10YR 5/3) clay films on faces of peds; few very dark grayish brown (10YR 3/2) root channels; about 2 percent gravel; common medium and coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; clear irregular boundary.
- 2BC—34 to 46 inches; brown (10YR 5/3) silty clay loam; moderate coarse angular blocky structure; very firm; few very fine and fine roots; few prominent brown (7.5YR 5/3) clay films on vertical faces of peds; common distinct brown (10YR 5/3) silt coatings on vertical faces of peds; very few prominent white (N 8/) carbonate coatings on faces of peds; a vein of loamy sand and sandy loam 13 inches long and 3 inches thick occurs at the base of this horizon; few very dark grayish brown (10YR 3/2) root channels; about 2 percent gravel; medium prominent light greenish gray (10Y 7/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; diffuse wavy boundary.
- 2C—46 to 80 inches; brown (7.5YR 5/3) silty clay loam; massive; firm; few very fine and fine roots in fracture planes; few prominent light greenish gray (10Y 7/1) silt coatings on fracture planes; very few prominent white (N 8/) carbonate coatings on fracture planes; few fine prominent light greenish gray (10Y 7/1) iron depletions in the matrix; many fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to the 2Bt horizon ranges from 20 to 40 inches. The depth to carbonates ranges from 24 to 50 inches. The content of gravel ranges from 0 to 10 percent in the sandy material and from 0 to 3 percent in the underlying clay material. The content of cobbles ranges from 0 to 3 percent in the sandy material and is 0 in the underlying clay material.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is dominantly sand, but the range includes loamy sand.

The Bs1 horizon has hue of 7.5YR and value and chroma of 3 or 4. The Bs2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 5 or 6. The content of ortstein in the Bs horizons ranges from 0 to 20 percent. The Bs horizons are sand or loamy sand.

The Bt part of the 2B/E horizon and the Bt horizon have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 5. They are clay loam, clay, silty clay, or silty clay loam. The E part of the 2B/E horizon has colors and textures similar to those of the E horizon. Some pedons have an E' or E/B horizon above the 2Bt horizon.

The 2C horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is clay, silty clay, or silty clay loam.

Kinross Series

The Kinross series consists of poorly drained soils on outwash plains and lake plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 2 percent.

Taxonomic classification: Sandy, mixed, frigid Typic Endoaquods

Typical pedon of Kinross muck, in an area of Kinross-Au Gres complex, 100 feet south and 2,030 feet west of the northeast corner of sec. 5, T. 26 N., R. 4 W., Grayling Township, Crawford County, Michigan; USGS Lake Margrethe, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 41 minutes 05.2 seconds N. and long. 84 degrees 49 minutes 00.7 second W., NAD 27:

- Oa—0 to 3 inches; muck, black (10YR 2/1) broken face and rubbed; about 80 percent fiber, 15 percent rubbed; weak medium granular structure; very friable; many fine to coarse roots; extremely acid; abrupt smooth boundary.
- E—3 to 10 inches; grayish brown (10YR 5/2) sand, light gray (10YR 7/2) dry; very weak very fine subangular blocky structure; very friable; common fine and medium roots; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; strongly acid; abrupt irregular boundary.
- Bhs—10 to 14 inches; dark reddish brown (5YR 3/2) sand; moderate medium subangular blocky structure; friable; common fine and medium roots; ortstein makes up about 40 percent of the horizon and occurs as horizontal layers and vertical columns; about 20 percent columns of material from the E horizon; very strongly acid; clear wavy boundary.
- Bs—14 to 22 inches; yellowish brown (10YR 5/6) sand; weak fine subangular blocky structure; very friable; common fine roots; about 20 percent columns of material from the E and Bhs horizons; common medium distinct pale brown (10YR 6/3) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.
- C—22 to 60 inches; yellowish brown (10YR 5/4) sand; single grain; loose; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; moderately acid.

The depth to the C horizon ranges from 16 to 28 inches. All of the mineral horizons are sand.

The Oa horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bhs horizon has hue of 5YR or 7.5YR and value and chroma of 2 or 3. The Bs horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The content of ortstein ranges from 10 to 45 percent in the Bhs and Bs horizons.

Some pedons have a BC horizon. This horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 6.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

Klacking Series

The Klacking series consists of well drained soils on moraines, kames, and outwash plains (fig. 20). These soils formed in sandy and loamy deposits. Permeability is rapid or moderately rapid. Slopes range from 0 to 50 percent.

Taxonomic classification: Loamy, mixed, semiactive, frigid Arenic Glossudalfs

Typical pedon of Klacking sand, 0 to 6 percent slopes, 950 feet east and 400 feet south of the northwest corner of sec. 5, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Oak Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 02.76 seconds N. and long. 84 degrees 13 minutes 08.69 seconds W., NAD 27:

- Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.
- A—1 to 2 inches; black (10YR 2/1) sand, gray (10YR 5/1) dry; about 30 percent gray (7.5YR 6/1) uncoated sand grains; weak fine granular structure; very friable; many fine and medium and common coarse roots; about 2 percent fine gravel; very strongly acid; abrupt smooth boundary.
- E—2 to 3 inches; grayish brown (10YR 5/2) sand, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; very friable; many fine and medium and common coarse roots; about 2 percent fine gravel; very strongly acid; clear wavy boundary.
- Bw1—3 to 11 inches; dark yellowish brown (10YR 4/6) sand; weak medium subangular blocky structure; very friable; common fine, medium, and coarse roots; about 2 percent fine gravel; strongly acid; clear wavy boundary.
- Bw2—11 to 21 inches; yellowish brown (10YR 5/6) sand; weak medium subangular blocky structure; very friable; few fine and common medium roots; about 2 percent fine gravel; moderately acid; clear wavy boundary.
- E and Bt—21 to 30 inches; light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/3) dry (E); weak medium subangular blocky structure; very friable; strong brown (7.5YR 4/6) loamy sand (Bt); moderate medium subangular blocky structure; very friable; few fine and common medium roots; about 5 percent fine and medium gravel; moderately acid; clear wavy boundary.
- B/E—30 to 41 inches; about 85 percent strong brown (7.5YR 4/6) sandy loam (Bt); surrounded by light yellowish brown (10YR 6/4) loamy sand (E); moderate medium and coarse subangular blocky structure; friable in the Bt part and very friable in the E part; few fine and common medium roots; strong brown (7.5YR 4/6) clay bridging between sand grains; about 10 percent gravel and 1 percent cobbles; moderately acid; clear wavy boundary.
- C—41 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 5 percent fine and medium gravel and 1 percent cobbles; strongly effervescent; moderately alkaline.

The depth to the C horizon ranges from 48 to more than 80 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3.

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

The E part of the E and Bt and B/E horizons has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is sand or loamy sand. The Bt part of the E and Bt and B/E horizons has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The Bt part



Figure 20.—A profile of Klacking sand. The upper part of the subsoil is weakly developed. Between the depths of 30 and 48 inches is an area of clay enrichment underlain by sandy material. Depth is marked in feet.

of the E and Bt horizon consists of lamellae of loamy sand or sandy loam $\frac{1}{8}$ inch to 2 inches thick. The Bt part of the B/E horizon and the lamellae in the E and Bt horizon have a total accumulation of more than 6 inches. The Bt part of the B/E horizon is sandy loam.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is sand.

Lamellic Haplorthods, sandy

Lamellic Haplorthods are well drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Sandy, mixed, frigid Lamellic Haplorthods

Reference pedon of Lamellic Haplorthods, sandy, 200 feet north and 1,500 feet east of the southwest corner of sec. 21, T. 26 N., R. 2 E., northeast part of Big Creek Township, Oscoda County, Michigan; USGS Island Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 37 minutes 27.4 seconds N. and long. 84 degrees 12 minutes 20 seconds W., WGS 84:

- Oe—0 to 2 inches; partially decomposed hardwood leaf litter; abrupt smooth boundary.
- A—2 to 3 inches; dark gray (10YR 4/1) sand, grayish brown (10YR 5/2) dry; single grain; loose; many very fine to very coarse roots; extremely acid; abrupt smooth boundary.
- E—3 to 8 inches; grayish brown (10YR 5/2) sand, very pale brown (10YR 7/3) dry; single grain; loose; many very fine to coarse roots; very strongly acid; clear smooth boundary.
- Bs1—8 to 14 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; friable; many fine to coarse roots; strongly acid; diffuse smooth boundary.
- Bs2—14 to 27 inches; dark yellowish brown (10YR 4/6) sand; weak medium subangular blocky structure; very friable; few fine and medium roots; strongly acid; clear smooth boundary.
- BC—27 to 36 inches; brownish yellow (10YR 6/6) sand; single grain; few fine and medium roots; moderately acid; 5 percent gravel and less than 1 percent cobbles; loose; abrupt smooth boundary.
- C—36 to 62 inches; very pale brown (10YR 7/4) sand; single grain; loose; moderately acid; clear smooth boundary.
- E and Bt—62 to 180 inches; very pale brown (10YR 7/4) sand, very pale brown (10YR 7/4) dry; single grain; loose; lamellae of strong brown (7.5YR 4/6) loamy sand; weak fine subangular blocky structure; very friable; moderately acid.

The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon, if it occurs, has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. It is dominantly sand, but the range includes fine sand.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is sand or fine sand.

The BC horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6.

The C horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 6.

The E part of the E and Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sandy loam. The combined thickness of the lamellae is less than 6 inches.

Lamellic Oxyaquic Haplorthods, sandy

Lamellic Oxyaquic Haplorthods are moderately well drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy, mixed, frigid Lamellic Oxyaquic Haplorthods

Reference pedon of Lamellic Oxyaquic Haplorthods, sandy, 410 feet north and 1,110 feet west of the southeast corner of sec. 16, T. 26 N., R. 4 E., Mentor Township, Oscoda County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 38 minutes 22.76 seconds N. and long. 83 degrees 57 minutes 08.46 seconds W., WGS 84:

- Oe—0 to 1 inch; partially decomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- A—1 to 5 inches; black (10YR 2/1) sand, very dark gray (10YR 3/1) dry; weak fine subangular blocky structure; very friable; many very fine to coarse roots; extremely acid; abrupt smooth boundary.

- E—5 to 7 inches; dark grayish brown (10YR 4/2) sand, brown (10YR 5/3) dry; weak very fine subangular blocky structure; very friable; common fine to medium roots; extremely acid; abrupt broken boundary.
- Bs1—7 to 10 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; very friable; many fine to coarse roots; very strongly acid; gradual smooth boundary.
- Bs2—10 to 16 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; many fine to coarse roots; strongly acid; gradual smooth boundary.
- Bs3—16 to 27 inches; dark yellowish brown (10YR 5/6) sand; weak medium subangular blocky structure; friable; common fine to coarse roots; moderately acid; clear smooth boundary.
- BC—27 to 55 inches; brownish yellow (10YR 6/6) sand; moderate medium subangular blocky structure; friable; few medium and coarse roots; common fine and medium prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.
- E and Bt1—55 to 63 inches; strong brown (7.5YR 4/6) sand, very pale brown (10YR 7/3) dry (E); single grain; loose; lamellae of strong brown (7.5YR 5/8) loamy sand (Bt); moderate medium subangular blocky structure; friable; common fine and medium distinct yellowish red (5YR 5/8) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary.
- E and Bt2—63 to 84 inches; brown (10YR 5/3) sand, very pale brown (10YR 7/3) dry (E); single grain; loose; lamellae of strong brown (7.5YR 5/8) loamy sand (Bt); moderate medium subangular blocky structure; friable; common fine and medium prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; moderately acid.

The depth to redoximorphic features is more than 18 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. It is dominantly sand, but the range includes fine sand.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is sand or fine sand.

The BC horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6.

The E part of the E and Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 6. It is sand or coarse sand. The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sandy loam. The total accumulation of bands is less than 6 inches.

Lamellic Udipsamments

Lamellic Udipsamments are moderately well drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy drift. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Mixed, frigid Lamellic Udipsamments

Reference pedon of Lamellic Udipsamments, 1,330 feet north and 1,580 feet east of the southwest corner of sec. 23, T. 26 N., R. 4 E., Mentor Township, Oscoda County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 37 minutes 43.57 seconds N. and long. 83 degrees 55 minutes 20.76 seconds W., WGS 84:

- Oe—0 to 1 inch; partially decomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- Ap—1 to 12 inches; black (10YR 2/1) sand; weak medium subangular blocky structure; very friable; many very fine to coarse and common very coarse roots; very strongly acid; abrupt smooth boundary.
- Bw—12 to 27 inches; dark yellowish brown (10YR 4/6) sand, yellowish brown (10YR 5/6) dry; weak coarse subangular blocky structure; very friable; common fine to very coarse roots; very strongly acid; abrupt smooth boundary.
- BC—27 to 58 inches; brownish yellow (10YR 6/6) sand; weak coarse subangular blocky structure; very friable; common fine to medium roots; strongly acid; diffuse smooth boundary.
- E and Bt—58 to 180 inches; light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/4) dry; loose; lamellae of dark yellowish brown (10YR 4/6) loamy sand (Bt); single grain; loose; moderately acid.

The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4. It is dominantly sand, but the range includes fine sand.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is sand or fine sand.

The E part of the E and Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. The Bt part of the E and Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 to 6. It is loamy sand or sandy loam. The combined thickness of the lamellae is less than 6 inches.

Leafriver Series

The Leafriver series consists of very poorly drained soils on outwash plains and moraines. These soils formed in thin deposits of organic material over sandy deposits. Permeability is moderate or moderately rapid in the organic material and rapid in the sandy material. Slopes are 0 to 1 percent.

Taxonomic classification: Sandy, mixed, frigid Histic Humaquepts

Typical pedon of Leafriver muck, in an area of Tawas-Leafriver mucks, about 200 feet north and 900 feet west of the southeast corner of sec. 19, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 47 minutes 53.33 seconds N. and long. 84 degrees 21 minutes 26.54 seconds W., NAD 27:

- Oa—0 to 12 inches; muck, black (10YR 2/1) broken face and rubbed; about 50 percent fiber, 15 percent rubbed; weak fine and medium granular structure; very friable; many very fine and fine, common medium, and few coarse roots; primarily woody fibers; about 10 percent wood fragments; slightly acid; abrupt wavy boundary.
- C1—12 to 20 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; 2-inch-thick band of very dark gray (2.5Y 3/1) loam at a depth of 16 inches; about 3 percent gravel; common fine and medium distinct brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
- C2—20 to 40 inches; yellowish brown (10YR 5/4) sand; single grain; loose; about 5 percent gravel; common fine and medium prominent brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
- C3—40 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 2 percent gravel; few medium and coarse prominent brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; slightly alkaline.

The thickness of the organic material ranges from 8 to 14 inches. The content of gravel ranges from 0 to 5 percent in the mineral material.

The Oa horizon has hue of 5YR to 10YR or is neutral in hue. It has value of 2 and chroma of 0 to 2.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. It is sand.

Loxley Series

The Loxley series consists of very poorly drained soils in depressions on outwash plains. These soils formed in organic deposits. Permeability ranges from moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Taxonomic classification: Dysic, frigid Typic Haplosaprists

Typical pedon of Loxley peat, in an area of Dawson-Loxley peats, 2,130 feet north and 2,160 feet west of the southeast corner of sec. 36, T. 28 N., R. 1 E., north part Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 27.2 seconds N. and long. 84 degrees 15 minutes 35.84 seconds W., NAD 27:

Oi—0 to 6 inches; peat, very dark brown (10YR 2/2) broken face, very dark brown (10YR 2/2) rubbed; about 80 percent fibers, 70 percent rubbed; weak fine granular structure; very friable; many fine and medium and few coarse roots; extremely acid; clear smooth boundary.

Oa1—6 to 16 inches; muck, dark brown (7.5YR 3/3) broken face, very dark brown (7.5YR 2.5/2) rubbed; about 60 percent fibers, 5 percent rubbed; weak medium subangular blocky structure; very friable; few fine roots; about 5 percent dark reddish brown (5YR 3/4) woody fragments; extremely acid; clear smooth boundary.

Oa2—16 to 43 inches; muck, very dark brown (10YR 2/2) broken face, very dark brown (10YR 2/2) rubbed; about 40 percent fibers, 2 percent rubbed; weak fine subangular blocky structure; very friable; about 2 percent black (N 2.5/) charcoal in thin bands; extremely acid; clear smooth boundary.

Oa3—43 to 51 inches; muck, black (7.5YR 2.5/1) broken face, black (7.5YR 2.5/1) rubbed; about 20 percent fibers, 1 percent rubbed; very friable; about 2 percent black (N 2.5/) charcoal in thin bands; extremely acid; clear smooth boundary.

Oa4—51 to 80 inches; muck, very dark brown (7.5YR 2.5/2) broken face, black (7.5YR 2.5/1) rubbed; about 10 percent fibers, 1 percent rubbed; very friable; extremely acid.

The thickness of the organic material ranges from 51 to more than 80 inches.

The Oi horizon is peat. It contains 2 to 25 percent moderately decomposed woody fragments. The unrubbed fiber content ranges from 55 to 80 percent.

The Oa horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. It is predominantly muck. It contains 0 to 2 percent highly decomposed woody fragments. The unrubbed fiber content ranges from 10 to 60 percent.

Lupton Series

The Lupton series consists of very poorly drained soils in depressions on moraines, outwash plains, and lake plains. These soils formed in organic deposits. Permeability ranges from moderately slow to moderately rapid. Slopes range from 0 to 2 percent.

Taxonomic classification: Euic, frigid Typic Haplosaprists

Typical pedon of Lupton muck, in an area of Tawas-Lupton mucks, 2,050 feet north and 80 feet west of the southeast corner of sec. 36, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 26.64 seconds N. and long. 84 degrees 15 minutes 08.39 seconds W., NAD 27:

- Oa1—0 to 4 inches; muck, black (10YR 2/1) broken face and rubbed; about 65 percent fiber, 15 percent rubbed; moderate thick platy structure parting to weak very fine subangular blocky; very friable; many very fine and fine and common medium and coarse roots; 5 percent yellowish brown (10YR 5/4) woody fragments; slightly acid; clear smooth boundary.
- Oa2—4 to 13 inches; muck, black (10YR 2/1) broken face and rubbed; about 50 percent fiber, 5 percent rubbed; weak medium subangular blocky structure parting to moderate fine and medium granular; very friable; common fine and medium roots; 5 percent yellowish brown (10YR 5/4) woody fragments; slightly acid; clear smooth boundary.
- Oa3—13 to 23 inches; muck, black (10YR 2/1) broken face and rubbed; about 10 percent fibers, 1 percent rubbed; weak fine granular structure; very friable; about 10 percent brown (7.5YR 4/3) woody fragments; slightly acid; clear smooth boundary.
- Oa4—23 to 55 inches; muck, black (10YR 2/1) broken face and rubbed; about 10 percent fibers, 2 percent rubbed; weak very fine and fine subangular blocky structure; very friable; about 15 percent reddish brown (5YR 4/4) woody fragments; slightly acid; gradual smooth boundary.
- Oa5—55 to 80 inches; muck, dark brown (7.5YR 3/2) broken face and rubbed; about 40 percent fibers, 10 percent rubbed; massive; very friable; about 1 percent strong brown (7.5YR 4/6) woody fragments; slightly acid.

The thickness of the organic material ranges from 51 to more than 80 inches.

The Oa horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is predominantly muck. It contains 15 to 30 percent highly decomposed woody fragments. The unrubbed fiber content ranges from 10 to 65 percent, and the rubbed fiber content ranges from 1 to 15 percent.

Mancelona Series

The Mancelona series consists of somewhat excessively drained soils on outwash plains and moraines. These soils formed in sandy and gravelly deposits. Permeability is rapid in the upper part, moderately rapid in the next part, and very rapid in the lower part. Slopes range from 0 to 35 percent.

Taxonomic classification: Sandy, mixed, frigid Alfic Haplorthods

Typical pedon of Mancelona sand, 0 to 6 percent slopes, 2,100 feet west and 50 feet north of the southeast corner of sec. 34, T. 32 N., R. 2 E., Montmorency Township, Montmorency County, Michigan; USGS Atlanta, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 06 minutes 47 seconds N. and long. 84 degrees 10 minutes 21 seconds W., NAD 27:

- A—0 to 3 inches; black (N 2.5/) sand, very dark gray (10YR 3/1) dry; weak fine and medium granular structure; very friable; common very fine and fine roots; about 1 percent gravel; very strongly acid; abrupt smooth boundary.
- E—3 to 6 inches; pinkish gray (7.5YR 6/2) sand, very pale brown (10YR 8/2) dry; weak fine granular structure; very friable; many very fine to coarse roots; about 1 percent gravel; very strongly acid; abrupt wavy boundary.

- Bs1—6 to 16 inches; brown (7.5YR 4/4) sand; weak medium subangular blocky structure; very friable; common very fine and fine and many medium and coarse roots; about 1 percent cobbles and 3 percent gravel; moderately acid; clear wavy boundary.
- Bs2—16 to 20 inches; yellowish brown (10YR 5/6) sand; weak fine subangular blocky structure; very friable; common fine and many medium and coarse roots; about 2 percent cobbles and 3 percent gravel; moderately acid; clear wavy boundary.
- E'—20 to 29 inches; light yellowish brown (10YR 6/4) sand; weak medium subangular blocky structure; very friable; few medium and coarse roots; about 2 percent cobbles and 5 percent gravel; moderately acid; abrupt wavy boundary.
- 2Bt—29 to 35 inches; reddish brown (5YR 4/4) gravelly sandy loam; weak medium subangular blocky structure parting to weak very fine subangular blocky; very friable; many fine, medium, and coarse roots; about 1 percent stones, 5 percent cobbles, and 25 percent gravel; prominent reddish brown (5YR 4/4) clay bridges between sand grains and coatings on the surfaces of rock fragments; neutral; clear wavy boundary.
- 3C—35 to 80 inches; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; about 2 percent stones, 10 percent cobbles, and 40 percent gravel; slightly effervescent; slightly alkaline.

The depth to carbonates ranges from 26 to 40 inches. The content of gravel ranges from 0 to 25 percent in the upper part of the profile and from 20 to 50 percent in the substratum. The content of cobbles ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly sand, but the range includes loamy sand.

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

The Bs horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. It is sand, loamy sand, gravelly sand, or gravelly loamy sand.

The E' horizon has hue of 7.5YR or 10YR, value of 6, and chroma of 4. It is sand, loamy sand, gravelly sand, or gravelly loamy sand. Some pedons do not have an E' horizon.

The 2Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6. It is loamy sand, sandy loam, or sandy clay loam or the gravelly analogs of these textures.

The 3C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is commonly stratified gravelly sand, gravelly coarse sand, very gravelly sand, coarse sand, or sand.

McGinn Series

The McGinn series consists of well drained soils on ground moraines. These soils formed in sandy and loamy deposits. Permeability is rapid in the upper sandy part and moderately rapid or moderate in the loamy material. Slopes range from 0 to 50 percent.

Taxonomic classification: Coarse-loamy, mixed, semiactive, frigid Haplic Glossudalfs

Typical pedon of McGinn loamy sand, 6 to 12 percent slopes, 150 feet south and 1,980 feet west of the northeast corner of sec. 23, T. 28 N., R. 6 E., Caledonia Township, Alcona County, Michigan; USGS Hubbard Lake Southwest, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 48 minutes 53.5 seconds N. and long. 83 degrees 40 minutes 19.78 seconds W., NAD 27:

- Oe—0 to 1 inch; partially decomposed forest litter; abrupt smooth boundary.
- A—1 to 2 inches; black (N 2.5/) loamy sand, very dark gray (N 3/) dry; weak medium granular structure; friable; many fine roots; about 3 percent gravel and 1 percent cobbles; very strongly acid; abrupt broken boundary.
- E—2 to 4 inches; light brownish gray (10YR 6/2) loamy sand; weak fine subangular blocky structure; friable; common fine roots; about 3 percent gravel and 1 percent cobbles; very strongly acid; abrupt broken boundary.
- Bw1—4 to 6 inches; strong brown (7.5YR 4/6) loamy sand; weak medium subangular blocky structure; friable; many fine and few medium roots; about 3 percent gravel and 1 percent cobbles; strongly acid; clear wavy boundary.
- Bw2—6 to 16 inches; dark yellowish brown (10YR 4/4) loamy sand; moderate coarse subangular blocky structure; friable; about 10 percent of the matrix is slightly brittle; common medium roots; about 3 percent gravel and 1 percent cobbles; strongly acid; abrupt wavy boundary.
- E'—16 to 18 inches; grayish brown (10YR 5/2) loamy sand; weak thick platy structure; slightly brittle; about 3 percent gravel and 1 percent cobbles; moderately acid; abrupt broken boundary.
- E/B—18 to 21 inches; about 75 percent grayish brown (10YR 5/2) loamy sand (E); weak thick platy structure; friable; surrounding peds of reddish brown (5YR 4/4) sandy loam (Bt); weak medium subangular blocky structure; slightly brittle; few medium roots; few faint reddish brown (5YR 4/4) clay films on faces of peds; about 3 percent gravel and 1 percent cobbles; moderately acid; abrupt irregular boundary.
- B/E—21 to 25 inches; about 80 percent reddish brown (5YR 4/4) sandy loam (Bt); surrounded and coated by grayish brown (10YR 5/2) loamy sand (E); moderate medium subangular blocky structure; friable; many distinct dark reddish brown (5YR 3/4) clay films on faces of peds; about 3 percent gravel and 1 percent cobbles; slightly acid; abrupt irregular boundary.
- Bt—25 to 35 inches; reddish brown (5YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; common fine roots; many distinct dark reddish brown (5YR 3/4) clay films on faces of peds; about 3 percent gravel and 1 percent cobbles; slightly acid; clear wavy boundary.
- C—35 to 80 inches; light reddish brown (5YR 6/3) sandy loam; massive with weakly expressed thick platy structure inherent from deposition; friable; few fine roots in vertical fractures; few prominent white (10YR 8/2) carbonate coatings in vertical fractures; about 5 percent gravel and 1 percent cobbles; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 24 to 40 inches. The thickness of the sandy upper part of the profile ranges from 14 to 20 inches. The content of gravel ranges from 2 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 5 percent.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Ap horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. Hue of 7.5YR and value and chroma of 4 do not occur together. Reaction is strongly acid.

The E' horizon and the E part of the E/B and B/E horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2. The 2Bt horizon and the B part of the E/B and B/E horizons have hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4. They are sandy loam or loam.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4.

Melita Series

The Melita series consists of somewhat excessively drained soils on moraines and outwash plains. These soils formed in sandy material over loamy deposits. Permeability is rapid in the upper sandy materials and moderately slow in the underlying loamy material. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy, mixed, frigid Alfic Haplorthods

Typical pedon of Melita sand, 0 to 6 percent slopes, 1,900 feet west and 2,450 feet south of the northeast corner of sec. 24, T. 30 N., R. 2 E., Briley Township, Montmorency County, Michigan; USGS Crooked Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 58 minutes 44 seconds N. and long. 84 degrees 08 minutes 24 seconds W., NAD 27:

- A—0 to 4 inches; very dark gray (10YR 3/1) sand, very dark grayish brown (10YR 3/2) dry; 25 percent light gray (10YR 7/1) uncoated sand grains; moderate medium granular structure; very friable; common fine and very fine roots; about 2 percent gravel; strongly acid; abrupt smooth boundary.
- E—4 to 8 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak medium granular structure; very friable; common fine and very fine roots; about 2 percent gravel; strongly acid; clear wavy boundary.
- Bs—8 to 16 inches; brown (7.5YR 4/4) sand; weak fine subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 2 percent gravel; strongly acid; clear wavy boundary.
- Bw1—16 to 26 inches; strong brown (7.5YR 5/6) sand; weak fine subangular blocky structure; very friable; common fine and few medium and coarse roots; about 2 percent gravel; strongly acid; clear wavy boundary.
- Bw2—26 to 43 inches; very pale brown (10YR 7/4) sand; weak medium subangular blocky structure; very friable; very few lamellae ($\frac{1}{8}$ inch thick) of strong brown (7.5YR 5/6) loamy sand; few medium and coarse roots; about 1 percent gravel; slightly acid; abrupt smooth boundary.
- 2Bt—43 to 47 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common distinct reddish brown (5YR 4/3) clay films on faces of pedis; few medium roots; neutral; abrupt wavy boundary.
- 2C—47 to 80 inches; 55 percent light reddish brown (5YR 6/3) and 45 percent light gray (5YR 7/1) silty clay loam; massive; very firm; violently effervescent; moderately alkaline.

The depth to carbonates ranges from 45 to 60 inches. The content of gravel ranges from 0 to 5 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. Some pedons have an Ap horizon. This horizon is dominantly sand, but the range includes loamy sand.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bs horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is dominantly sand, but the range includes loamy sand. Ortstein is in this horizon in some pedons.

The Bw horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 6. It is dominantly sand, but the range includes loamy sand.

The 2Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 3 to 6. It is clay loam, loam, or silty clay loam.

The 2C horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 1 to 6. It is clay loam, loam, or silty clay loam.

Menominee Series

The Menominee series consists of well drained soils on till plains and moraines. These soils formed in sandy material over loamy deposits. Permeability is rapid in the upper sandy part and moderate or moderately slow in the loamy material. Slopes range from 12 to 70 percent.

Taxonomic classification: Sandy over loamy, mixed, active, frigid Alfic Haplorthods

Typical pedon of Menominee sand, 12 to 18 percent slopes, 300 feet north and 2,200 feet east of the southwest corner of sec. 30, T. 24 N., R. 5 E., Plainfield Township, Iosco County, Michigan; USGS South Branch, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 26 minutes 14 seconds N. and long. 83 degrees 52 minutes 34 seconds W., NAD 27:

- A—0 to 4 inches; very dark grayish brown (10YR 3/2) sand, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many fine and medium and few coarse roots; extremely acid; clear smooth boundary.
- E—4 to 7 inches; grayish brown (10YR 5/2) sand, white (10YR 8/2) dry; weak medium subangular blocky structure; very friable; many fine and medium and few coarse roots; extremely acid; clear smooth boundary.
- Bs1—7 to 18 inches; brown (7.5YR 4/4) sand; weak medium subangular blocky structure; very friable; many fine and medium and few coarse roots; extremely acid; clear wavy boundary.
- Bs2—18 to 23 inches; dark yellowish brown (10YR 4/6) sand; weak medium subangular blocky structure; very friable; many medium and few coarse roots; very strongly acid; clear wavy boundary.
- 2B/E—23 to 39 inches; 70 percent brown (7.5YR 5/4) clay loam (Bt) surrounded by light brownish gray (10YR 6/2) sandy loam (E), light gray (10YR 7/1) dry; strong medium angular blocky structure; firm; few fine roots; common distinct brown (7.5YR 5/4) clay films; strongly acid; clear wavy boundary.
- 2Bt—39 to 59 inches; reddish brown (5YR 4/4) clay loam; weak coarse subangular blocky structure; firm; few fine roots; common distinct reddish brown (5YR 4/4) clay films on faces of peds; neutral; clear wavy boundary.
- 2C—59 to 80 inches; brown (7.5YR 5/4) loam; massive; firm; common white (10YR 8/2) carbonate coatings in cracks; slightly effervescent; moderately alkaline.

The thickness of the sand ranges from 20 to 40 inches.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. Pedons in cultivated areas have an Ap horizon, which has hue of 10YR or 7.5YR and value and chroma of 2 or 3.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 or 3. It is sand, fine sand, loamy sand, or loamy fine sand.

The Bs1 horizon has hue of 7.5YR and value and chroma of 3 or 4. It is sand or fine sand. The Bs2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 6. It is sand or fine sand.

Some pedons have an E' horizon. This horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 4.

The E part of the 2B/E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 or 3. The B part of the 2B/E horizon and the 2Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. They are clay loam or silty clay loam.

Some pedons have a 2BC horizon. This horizon has the same colors and textures as the 2Bt horizon. The content of clay ranges from 18 to 35 percent.

The 2C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6. It is clay loam, loam, or silty clay loam.

Millersburg Series

The Millersburg series consists of well drained soils on ground moraines, end moraines, and disintegration moraines. These soils formed in sandy and loamy deposits. Permeability is moderately rapid or rapid in the upper sandy part and moderate in the loamy material. Slopes range from 0 to 35 percent.

Taxonomic classification: Coarse-loamy, mixed, active, frigid Haplic Glossudalfs

Typical pedon of Millersburg loamy sand, 6 to 18 percent slopes, 475 feet south and 1,600 feet west of the northeast corner of sec. 5, T. 28 N., R. 3 E., west part of Clinton Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 51 minutes 14.16 seconds N. and long. 84 degrees 05 minutes 50.79 seconds W., NAD 27:

- Oe—0 to 1 inch; partially decomposed leaves, twigs, and grass; abrupt wavy boundary.
- A—1 to 2 inches; black (10YR 2/1) loamy sand, dark gray (7.5YR 4/1) dry; weak fine subangular blocky structure parting to weak fine granular; very friable; many very fine and fine roots; about 2 percent gravel; neutral; abrupt wavy boundary.
- E—2 to 4 inches; brown (7.5YR 5/2) sand, pinkish gray (7.5YR 7/2) dry; weak fine and medium subangular blocky structure; very friable; common very fine, fine, and medium and few coarse roots; about 2 percent gravel; moderately acid; abrupt wavy boundary.
- Bw1—4 to 8 inches; strong brown (7.5YR 4/6) loamy sand; weak medium and coarse subangular blocky structure; very friable; common very fine, fine, and medium and few coarse roots; about 2 percent gravel; strongly acid; clear wavy boundary.
- Bw2—8 to 12 inches; dark yellowish brown (10YR 4/6) loamy sand; weak medium and coarse subangular blocky structure; very friable; few very fine and fine, common medium, and few coarse roots; about 2 percent gravel; strongly acid; abrupt wavy boundary.
- E'—12 to 14 inches; brown (7.5YR 5/2) loamy sand, light gray (10YR 7/2) dry; weak medium and coarse subangular blocky structure; friable, slightly brittle; few very fine and fine roots; about 2 percent gravel; strongly acid; abrupt wavy boundary.
- B/E—14 to 27 inches; about 51 percent yellowish red (5YR 4/6) sandy loam (Bt); surrounded by brown (7.5YR 5/2) sand, light gray (10YR 7/2) dry (E); weak medium and coarse subangular blocky structure (Bt); friable in the Bt part and very friable in the E part; weak medium subangular blocky structure (E); few very fine, fine, and medium roots; few distinct reddish brown (5YR 5/4) clay films on faces of peds; about 3 percent gravel and 5 percent cobbles; strongly acid; clear wavy boundary.
- Bt—27 to 34 inches; reddish brown (5YR 4/4) sandy loam; weak medium and coarse subangular blocky structure; friable; common distinct reddish brown (5YR 4/4) clay films on faces of peds; few pockets of sandy clay loam; about 12 percent gravel; neutral; clear wavy boundary.
- BC—34 to 76 inches; yellowish red (5YR 4/6) sandy loam and strong brown (7.5YR 4/6) loamy sand; weak medium and coarse subangular blocky structure; friable; common very fine and fine and few medium roots; few distinct reddish brown (5YR 4/4) clay films on faces of peds; common faint clay bridging between sand grains; a few pockets of brown (7.5YR 5/2) sand; about 13 percent gravel and 1 percent cobbles; slightly effervescent; neutral; clear wavy boundary.
- C—76 to 80 inches; brown (7.5YR 5/3) loamy sand; massive; friable; about 7 percent gravel; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 30 to 60 inches. The content of cobbles ranges from 0 to 5 percent throughout the profile, and the content of gravel ranges from 0 to 14 percent.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It is dominantly loamy sand, but the range includes sand. Reaction ranges from extremely acid to moderately acid.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. It is loamy sand or sand. Reaction ranges from extremely acid to moderately acid.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loamy sand or sand. Reaction ranges from very strongly acid to neutral.

The E' horizon and the E part of the B/E horizon have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 or 3. They are sand or loamy sand.

The Bt part of the E/B horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. They are dominantly sandy loam, but the range includes sandy clay loam. Reaction ranges from slightly acid to slightly alkaline in the Bt horizon.

The BC horizon has hue of 5YR, value of 4 to 6, and chroma of 3 to 6. It is sandy loam.

The C horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 3 or 4. It is predominantly loamy sand, but the range includes sandy loam. The horizon has lenses of sand or gravel in some pedons.

Mongo Series

The Mongo series consists of well drained soils on lake plains. These soils formed in loamy and clayey deposits. Permeability is very slow. Slopes range from 12 to 45 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Haplic Glossudalfs

Typical pedon of Mongo silt loam, 12 to 18 percent slopes, 2,500 feet east and 780 feet north of the southwest corner of sec. 33, T. 27 N., R. 2 E., Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 41 minutes 00.22 second N. and long. 84 degrees 12 minutes 10.04 seconds W., NAD 27:

- A—0 to 7 inches; black (2.5Y 2.5/1) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many very fine, fine, medium, and coarse roots; about 1 percent gravel; neutral; abrupt smooth boundary.
- B/E—7 to 16 inches; about 70 percent brown (7.5YR 4/3) clay (Bt); surrounded by grayish brown (10YR 5/2) silty clay, light gray (10YR 7/2) dry (E); moderate medium subangular blocky structure; firm; many very fine, fine, medium, and coarse roots; few distinct reddish brown (5YR 4/4) clay films on faces of peds; about 1 percent gravel; slightly acid; clear wavy boundary.
- Bt—16 to 23 inches; dark brown (7.5YR 3/4) clay; moderate medium subangular blocky structure; firm; common very fine, fine, and medium roots; common distinct reddish brown (5YR 4/4) and dark brown (7.5YR 3/4) clay films on faces of peds; about 1 percent gravel; neutral; clear wavy boundary.
- BC—23 to 44 inches; brown (7.5YR 4/3 and 10YR 5/3) clay and silty clay; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine and medium roots; common distinct brown (7.5YR 4/3) clay films on faces of peds in the upper part of the horizon; common prominent light gray (10YR 7/2) irregular carbonate coatings along fracture planes; about 1 percent gravel; strongly effervescent; slightly alkaline; clear wavy boundary.

C—44 to 80 inches; brown (10YR 5/3) clay; weak medium platy structure; firm; few fine and medium roots; many prominent light gray (10YR 7/1 and 7/2) and few prominent light greenish gray (5GY 8/1 and 10GY 8/1) carbonate coatings along fracture planes; few strata of silty clay and silt; about 1 percent gravel; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix below a depth of 50 inches; violently effervescent; moderately alkaline.

The depth to the C horizon and the depth to carbonates range from 40 to 60 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 2.5Y to 7.5YR, value of 2 to 4, and chroma of 1 to 3.

The E part of the B/E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 4. Some pedons have an E horizon. This horizon is silty clay.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 or 4. They are clay, silty clay loam, or silty clay. The content of clay ranges from 35 to 60 percent. The content of sand coarser than very fine sand ranges from 0 to 15 percent.

The BC and C horizons have hue of 5YR to 10YR, value of 3 to 6, and chroma of 3 or 4. They are clay, silty clay, or silty clay loam. Some pedons have thin strata of silty material $\frac{1}{8}$ to $\frac{1}{2}$ inch thick.

Morganlake Series

The Morganlake series consists of moderately well drained soils on moraines and till plains. These soils formed in sandy material over loamy deposits. Permeability is rapid in the upper sandy material and moderate or moderately slow in the lower loamy material. Slopes range from 0 to 12 percent.

Taxonomic classification: Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods

Typical pedon of Morganlake loamy sand, in an area of Morganlake-Ossineke, sandy substratum-Blue Lake complex, 0 to 6 percent slopes, 2,270 feet west and 2,390 feet north of the southeast corner of sec. 35, T. 28 N., R. 3 E., west part of Clinton Township, Oscoda County, Michigan; USGS Comins, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 32.91 seconds N. and long. 84 degrees 02 minutes 21.11 seconds W., NAD 27:

A—0 to 2 inches; black (7.5YR 2.5/1) loamy sand, very dark gray (10YR 3/1) dry; 30 percent uncoated sand grains; weak medium granular structure; very friable; common medium, many fine, and few coarse roots; about 3 percent medium gravel; strongly acid; abrupt wavy boundary.

E—2 to 5 inches; grayish brown (10YR 5/2) sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots; about 3 percent medium gravel; strongly acid; abrupt wavy boundary.

Bs—5 to 11 inches; brown (7.5YR 4/3) sand; weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots; about 3 percent medium gravel; moderately acid; clear wavy boundary.

E'—11 to 21 inches; brown (10YR 5/3) sand, very pale brown (10YR 8/3) dry; weak medium subangular blocky structure; very friable; few fine, medium, and coarse roots; about 3 percent fine and medium gravel; neutral; abrupt wavy boundary.

2B/E—21 to 23 inches; about 85 percent brown (7.5YR 4/4) sandy clay loam (Bt); strong coarse subangular blocky structure; firm; surrounded by brown (10YR 5/3) sand (E); weak fine subangular blocky structure; very friable; few medium and coarse roots; common faint brown (7.5YR 4/3) clay films on faces of pedis; few distinct very dark brown (7.5YR 2.5/2) organic coatings in root channels; about 7

- percent gravel and 1 percent cobbles; few medium distinct yellowish red (5YR 4/6) masses of iron accumulation in the matrix; neutral; abrupt irregular boundary.
- 2Bt—23 to 28 inches; brown (7.5YR 4/4) sandy clay loam; strong coarse subangular blocky structure; firm; common faint brown (7.5YR 4/3) clay films on faces of pedis; few distinct very dark brown (7.5YR 2.5/2) organic coatings in root channels; about 7 percent gravel and 1 percent cobbles; few medium distinct yellowish red (5YR 4/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
- 2BC—28 to 33 inches; brown (7.5YR 5/4) sandy loam; strong coarse subangular blocky structure; firm; few medium roots; few faint brown (7.5YR 4/3) clay films on faces of pedis; few distinct very dark brown (7.5YR 2.5/2) organic coatings in root channels; about 10 percent gravel and 1 percent cobbles; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; diffuse wavy boundary.
- 2C—33 to 80 inches; brown (7.5YR 5/4) loam; massive; few medium roots in the upper part; common prominent white (10YR 8/1) horizontal streaks of carbonate coatings; few prominent light gray (10YR 7/1) carbonate coatings in fractures; about 10 percent gravel and 1 percent cobbles; common prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to the loamy material ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 5 percent.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly loamy sand, but the range includes sand.

The E horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 or 3. It is dominantly sand, but the range includes loamy sand.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 to 6, and chroma of 4 to 6. It is dominantly sand, but the range includes loamy sand. This horizon contains ortstein in some pedons.

The E part of the 2B/E horizon and the E' horizon have hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 or 3. The texture is dominantly sand, but the range includes loamy sand. The Bt part of the 2B/E horizon and the 2Bt horizon have hue of 5YR, value of 3 to 6, and chroma of 4 to 6. They are clay loam, sandy clay loam, or silty clay loam.

The BC and 2C horizons have hue of 5YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4. They are clay loam, sandy clay loam, sandy loam, loam, silt loam, or silty clay loam. Some pedons have strata of sand and fine sand $\frac{1}{2}$ inch to 2 inches thick.

Negwegon Series

The Negwegon series consists of moderately well drained soils on lake plains. These soils formed in silty and clayey deposits. Permeability is very slow. Slopes range from 2 to 12 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Oxyaquic Glossudalfs

Typical pedon of Negwegon silt loam, 2 to 6 percent slopes, 1,475 feet north and 2,775 feet west of the southeast corner of sec. 31, T. 27 N., R. 4 E., east part of Comins Township, Oscoda County, Michigan; USGS Fairview, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 41 minutes 07.51 seconds N. and long. 84 degrees 00 minutes 00.52 second W., NAD 27:

- Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure parting to moderate

- fine and medium granular; friable; many very fine, common fine, and few medium and coarse roots; less than 1 percent gravel; slightly acid; abrupt wavy boundary.
- B/E—10 to 15 inches; about 85 percent brown (7.5YR 5/3) silty clay loam (Bt); surrounded by light brown (7.5YR 6/3) silt loam (E), pinkish gray (7.5YR 7/2) dry; moderate medium and coarse subangular blocky structure parting to moderate fine subangular blocky; firm; common very fine and few medium and coarse roots; few prominent brown (5YR 5/3) clay films on faces of peds; less than 1 percent gravel; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.
- Bt1—15 to 23 inches; reddish brown (5YR 4/3) silty clay; moderate fine and medium subangular blocky structure parting to moderate very fine subangular blocky; friable; common very fine and few fine and medium roots; common prominent reddish brown (5YR 4/3) clay films on faces of peds; less than 1 percent gravel; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.
- Bt2—23 to 34 inches; brown (7.5YR 4/3) silty clay; moderate medium prismatic structure parting to moderate medium and coarse angular blocky; firm; few very fine, fine, medium, and coarse roots; many prominent reddish brown (5YR 4/3) clay films on faces of peds; less than 1 percent gravel; few fine prominent greenish gray (5GY 7/1) iron depletions in the matrix; common fine distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
- C—34 to 80 inches; brown (7.5YR 5/4) silty clay loam; massive; firm; less than 1 percent gravel; few prominent pink (7.5YR 7/3) carbonate coatings; few fine prominent greenish gray (10GY 6/1) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 4/6 and 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 30 to 36 inches. The content of gravel ranges from 0 to 2 percent throughout the profile.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 2. It is silt loam. It is silty clay loam in pedons in eroded areas.

The E part of the B/E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is silt loam.

The Bt part of the B/E horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. They are silty clay loam, clay, or silty clay.

Some pedons have a BC horizon. This horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

The C horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 3 or 4. It is silty clay loam or silty clay. In some pedons this horizon is stratified with silt loam.

Nester Series

The Nester series consists of moderately well drained soils on ground moraines and disintegration moraines. These soils formed in loamy and clayey deposits. Permeability is slow. Slopes range from 0 to 12 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Oxyaquic Glossudalfs

Typical pedon of Nester loam, in an area of Morganlake-Nester complex, 6 to 12 percent slopes, 2,000 feet west and 1,850 feet south of the northeast corner of sec. 29, T. 27 N., R. 2 E., Elmer Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 42 minutes 19.66 seconds N. and long. 84 degrees 13 minutes 14.77 seconds W., NAD 27:

- A—0 to 3 inches; black (10YR 2/1) loam, gray (10YR 5/1) dry; weak medium granular structure; very friable; many very fine, fine, medium, and coarse roots; about 3 percent gravel; moderately acid; abrupt smooth boundary.
- E—3 to 6 inches; light brownish gray (10YR 6/2) loam, light gray (10YR 7/2) dry; weak medium subangular blocky structure; friable; common fine, medium, and coarse roots; about 3 percent gravel; strongly acid; clear wavy boundary.
- E/B—6 to 16 inches; about 70 percent light brownish gray (10YR 6/2) clay loam, light gray (10YR 7/2) dry (E); surrounding peds of reddish brown (5YR 5/3) clay loam (Bt); moderate medium subangular blocky structure; firm; common fine, medium, and coarse roots; few faint reddish brown (5YR 4/4) clay films on faces of peds; about 4 percent gravel; strongly acid; clear wavy boundary.
- Bt—16 to 34 inches; reddish brown (5YR 4/3) clay; moderate medium subangular blocky structure; firm; common fine, medium, and coarse roots; common faint reddish brown (5YR 4/4) clay films on faces of peds; about 4 percent gravel starting at a depth of 23 inches; few fine faint brown (7.5YR 4/4) and few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
- BC—34 to 41 inches; brown (7.5YR 5/3) clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine and fine roots; common distinct reddish brown (5YR 4/4) clay films on vertical faces of peds and along root channels; few prominent light gray (10YR 7/2) carbonate coatings on faces of some peds and fracture planes; about 5 percent gravel; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix in the upper part of the horizon; strongly effervescent; slightly alkaline; clear wavy boundary.
- C—41 to 80 inches; brown (10YR 5/3) clay loam; massive; very firm; few very fine and fine roots; common prominent light gray (10YR 7/2 and 2.5Y 7/2) carbonate coatings along fracture planes; few lenses of brown (7.5YR 4/4) and reddish brown (5YR 5/4) loamy sand, sandy loam, and loam; about 9 percent gravel; few fine prominent strong brown (7.5YR 4/6 and 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 20 to 50 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 3 percent.

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

The E horizon and the E part of the E/B horizon have hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 or 3. They are sandy loam, loam, or clay loam.

The Bt part of the E/B horizon and the Bt horizon have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. They are clay loam, silty clay loam, or clay.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 or 4. It is clay loam or silty clay loam.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4. It is clay loam or silty clay loam.

Ossineke Series

The Ossineke series consists of moderately well drained soils on ground moraines and disintegration moraines (fig. 21). These soils formed in loamy deposits. Permeability is moderately slow or slow. Slopes range from 0 to 12 percent.

Taxonomic classification: Fine-loamy, mixed, semiactive, frigid Oxyaquic Glossudalfs

Typical pedon of Ossineke fine sandy loam, 0 to 6 percent slopes, 2,300 feet north and 200 feet west of the southeast corner of sec. 35, T. 28 N., R. 3 E., west part of



Figure 21.—A profile of Ossineke fine sandy loam. This slowly permeable soil formed in loamy material on moraines and is considered prime farmland. Depth is marked in inches.

Clinton Township, Oscoda County, Michigan; USGS Comins, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 30.84 seconds N. and long. 84 degrees 01 minute 53.07 seconds W., NAD 27:

Ap—0 to 9 inches; very dark brown (10YR 2/2) fine sandy loam, gray (10YR 5/1) dry; less than 20 percent remnants of pinkish gray (7.5YR 6/2) material from the E horizon and strong brown (7.5YR 5/6) remnants of material from the Bw horizon; moderate very fine subangular blocky structure parting to moderate fine granular; friable; many very fine and fine and few medium roots; about 4 percent gravel; neutral; abrupt smooth boundary.

B/E—9 to 16 inches; about 60 percent brown (7.5YR 5/4) clay loam (Bt); surrounding light brownish gray (10YR 6/2) loamy fine sand, light gray (10YR 7/2) dry (E); moderate fine and medium subangular blocky structure (Bt); firm (Bt); moderate fine subangular blocky structure (E); friable; common very dark brown (10YR 2/2) root channels; few prominent brown (7.5YR 5/4) clay films on faces of peds; about 2 percent gravel; neutral; clear wavy boundary.

- Bt1—16 to 20 inches; dark yellowish brown (7.5YR 4/6) clay loam; moderate medium and coarse subangular blocky structure; firm; common very fine roots; common prominent brown (7.5YR 4/4) clay films on faces of peds; common very dark brown (10YR 2/2) root channels; less than 10 percent light yellowish brown (2.5Y 6/3) material from the E horizon; about 2 percent gravel; common fine and medium distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
- Bt2—20 to 29 inches; yellowish brown (7.5YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common very fine roots; common prominent brown (7.5YR 4/3) clay films on faces of peds; common very dark brown (10YR 2/2) root channels; about 2 percent gravel; common fine prominent light greenish gray (5GY 7/1) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very slightly effervescent; neutral; clear wavy boundary.
- C1—29 to 50 inches; light brown (7.5YR 6/4) loam; massive; firm; few very fine roots; few pinkish white (7.5YR 8/2) carbonate coatings along fracture planes; few lenses of strong brown (7.5YR 4/6) loamy sand $\frac{1}{4}$ to $\frac{1}{2}$ inch thick; few very dark brown (10YR 2/2) root channels; about 3 percent gravel; few fine and medium prominent light greenish gray (10Y 7/1) iron depletions in the matrix; common medium and coarse distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.
- C2—50 to 80 inches; brown (7.5YR 5/4) sandy loam with strata of reddish yellow (7.5YR 6/6) loamy sand and light brown (7.5YR 6/4) silt loam; massive; firm; common pinkish white (7.5YR 8/2) carbonate coatings along fracture planes; about 5 percent gravel and 3 percent cobbles; few fine and medium prominent light greenish gray (5GY 7/1) iron depletions in the matrix; common medium and coarse prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 20 to 40 inches. The content of gravel ranges from 2 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 4 percent. A sandy substratum phase is recognized.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam.

The Bt part of the B/E horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is loam, clay loam, or sandy clay loam. The E part of the B/E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4. It is loamy fine sand, sandy loam, or fine sandy loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is dominantly clay loam, but the range includes loam and sandy clay loam. In some pedons the lower part of the Bt horizon contains carbonates.

Some pedons have a BC horizon. This horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 2 to 4. It is clay loam, loam, fine sandy loam, sandy loam, or sandy clay loam.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. It is dominantly loam, but the range includes clay loam, fine sandy loam, sandy loam, and sandy clay loam.

The 2C horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 5. It is sand, loamy sand, gravelly sand, or gravelly loamy sand. The content of gravel ranges from 2 to 25 percent.

Oxyaquic Udipsamments

Oxyaquic Udipsamments are moderately well drained soils on outwash plains, lake plains, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 6 percent.

Taxonomic classification: Sandy, mixed, frigid Oxyaquic Udipsamments

Reference pedon of Oxyaquic Udipsamments, nearly level and undulating, 2,570 feet north and 740 feet west of the southeast corner of sec. 8, T. 26 N., R. 4 E., Mentor Township, Oscoda County, Michigan; USGS McKinley, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 39 minutes 37.63 seconds N. and long. 83 degrees 58 minutes 19.20 seconds W., WGS 84:

- Oe—0 to 1 inch; partially decomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- A—1 to 5 inches; very dark brown (10YR 2/2) sand; weak fine subangular blocky structure; very friable; many very fine to coarse roots; extremely acid; gradual smooth boundary.
- Bw1—5 to 15 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; many fine to very coarse roots; very strongly acid; gradual smooth boundary.
- Bw2—15 to 25 inches; yellowish brown (10YR 5/8) coarse sand; weak fine subangular blocky structure; very friable; common fine to very coarse roots; few fine distinct yellowish red (5YR 5/8) masses of iron accumulation in the matrix in the lower part of the horizon; very strongly acid; gradual smooth boundary.
- BC—25 to 34 inches; brownish yellow (10YR 6/8) sand; weak fine subangular blocky structure; very friable; few medium to very coarse roots; common fine and few coarse distinct yellowish red (5YR 5/8) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.
- C1—34 to 43 inches; light yellowish brown (10YR 6/4) sand; weak fine subangular blocky structure; very friable; few coarse prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary.
- C2—43 to 71 inches; brown (10YR 5/3) coarse sand; single grain; loose; few coarse prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.
- C3—71 to 80 inches; brown (10YR 5/3) sand; single grain; loose; few coarse prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; slightly acid.

The depth to redoximorphic features is more than 18 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is dominantly sand, but the range includes fine sand.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It is sand or fine sand.

The BC horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6. It is coarse sand or sand.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 8. It is coarse sand or sand.

Parmalee Series

The Parmalee series consists of moderately well drained soils on lake plains. These soils formed in loamy, clayey, and silty deposits. Permeability is slow. Slopes range from 0 to 12 percent.

Taxonomic classification: Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs

Typical pedon of Parmalee fine sandy loam, 0 to 6 percent slopes, 100 feet north and 2,700 feet west of the southeast corner of sec. 18, T. 26 N., R. 2 E., Big Creek Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 38 minutes 17.67 seconds N. and long. 84 degrees 14 minutes 30.03 seconds W., NAD 27:

- Ap—0 to 8 inches; black (10YR 2/1) fine sandy loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; many fine and medium and few coarse roots; neutral; abrupt smooth boundary.
- E/B—8 to 18 inches; about 80 percent brown (10YR 5/3) fine sandy loam, light gray (10YR 7/2) dry (E); surrounding brown (7.5YR 4/4) loam (Bt); moderate coarse subangular blocky structure; friable; few fine and medium roots; common black (10YR 2/1) organic coatings in root channels and krotovinas; few faint brown (7.5YR 4/3) clay films on faces of peds; 1 percent fine gravel; slightly alkaline; clear wavy boundary.
- Bt1—18 to 22 inches; brown (7.5YR 4/4) loam; strong coarse subangular blocky structure; firm; few fine and medium roots; common black (10YR 2/1) organic coatings in root channels and krotovinas; common faint brown (7.5YR 4/3) clay films on faces of peds; 1 percent fine gravel; slightly alkaline; clear wavy boundary.
- Bt2—22 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong coarse angular blocky structure; very firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; 2 percent fine gravel; many fine distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; slightly alkaline; clear wavy boundary.
- BC—33 to 51 inches; brown (10YR 5/3) silty clay loam; moderate coarse angular blocky structure; very firm; few fine roots; few faint grayish brown (10YR 5/2) clay films on faces of peds; few varves of very fine sandy loam and loamy very fine sand; 2 percent fine gravel; few fine prominent light bluish gray (5B 7/1) iron depletions in the matrix; many fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear wavy boundary.
- C—51 to 80 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; 1 percent fine gravel; common medium prominent light bluish gray (5B 7/1) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to the base of the argillic horizon ranges from 20 to 40 inches. The depth to carbonates ranges from 20 to 35 inches. The content of gravel ranges from 0 to 3 percent throughout the profile. The depth to redoximorphic concentrations ranges from 18 to 30 inches.

The Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or very fine sandy loam. Pedons in forested areas have an A horizon. This horizon is 3 to 6 inches thick. It has textures and colors similar to those of the Ap horizon.

The E part of the E/B horizon has hue of 10YR, value of 5, and chroma of 2 or 3. It is fine sandy loam or very fine sandy loam. Some pedons have a B/E horizon, which has colors and textures similar to those of the E/B horizon. The Bt part of the E/B horizon has colors and textures similar to those of the Bt horizon.

The Bt horizon has hue of 7.5YR or 10YR, value of 4, and chroma of 3 or 4. It is loam or silty clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 3 or 4. In some pedons it has strata with chroma of 2. It is silty clay loam or stratified silty clay loam and silt loam. Reaction is slightly alkaline or moderately alkaline.

Perecheney Series

The Perecheney series consists of moderately well drained soils on moraines and outwash plains. These soils formed in sandy and loamy deposits. Permeability is rapid in the sandy material and moderate or moderately slow in the loamy material. Slopes range from 0 to 12 percent.

Taxonomic classification: Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs

Typical pedon of Perecheney sand, in an area of Klacking-Perecheney sands, 0 to 6 percent slopes, 600 feet south and 700 feet west of the northeast corner of sec. 4, T. 27 N., R. 2 E., south part of Elmer Township, Oscoda County, Michigan; USGS Oak Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 01.26 seconds N. and long. 84 degrees 11 minutes 41.7 seconds W., NAD 27:

Oa—0 to 2 inches; well decomposed forest litter; abrupt smooth boundary.

E—2 to 7 inches; brown (7.5YR 5/3) sand, pinkish gray (7.5YR 6/2) dry; weak fine and medium granular structure; very friable; many very fine and fine and common medium and coarse roots; about 5 percent gravel; very strongly acid; abrupt wavy boundary.

Bw1—7 to 12 inches; dark yellowish brown (10YR 4/6) sand; weak fine and medium subangular blocky structure; very friable; common very fine, fine, medium, and coarse roots; about 7 percent gravel and 1 percent cobbles; very strongly acid; clear wavy boundary.

Bw2—12 to 21 inches; brownish yellow (10YR 6/6) sand; weak fine and medium subangular blocky structure; very friable; few very fine to medium roots; about 9 percent gravel and 1 percent cobbles; very strongly acid; clear wavy boundary.

E'—21 to 28 inches; about 90 percent light yellowish brown (10YR 6/4) loamy sand, light gray (10YR 7/2) dry; weak fine and medium subangular blocky structure; very friable; surrounding fragments of brown (7.5YR 4/4 and 5/3) (Bt); few very fine to medium roots; about 5 percent gravel; few fine distinct strong brown (7.5YR 4/6 and 5/6) iron accumulations in the matrix; strongly acid; clear wavy boundary.

2B/E—28 to 42 inches; about 68 percent brown (7.5YR 5/3 and 4/4) loam, sandy clay loam, and sandy loam; weak medium and coarse subangular blocky structure; friable; surrounding light yellowish brown (10YR 6/4) sand, very pale brown (10YR 7/3) dry (E); weak fine subangular blocky structure; very friable; few prominent brown (7.5YR 4/4) clay films on faces of peds; few very fine to coarse roots; about 7 percent gravel and 2 percent cobbles; few fine and medium distinct strong brown (7.5YR 4/6 and 5/6) iron accumulations in the matrix; slightly acid; clear irregular boundary.

2BC—42 to 44 inches; strong brown (7.5YR 4/6), brown (10YR 5/3), and brownish yellow (10YR 6/6) loamy sand, sandy loam, very fine sandy loam, and sand; weak fine and moderate medium subangular blocky structure; friable; few very fine and fine roots; few prominent brown (7.5YR 4/4) clay films on faces of peds; very few prominent very pale brown (10YR 7/3) carbonate coatings on faces of peds; about

10 percent gravel and 2 percent cobbles; common fine and medium distinct strong brown (7.5YR 5/8) and common fine and medium faint strong brown (7.5YR 5/6) and yellowish red (5YR 4/6) iron accumulations in the matrix; violently effervescent; moderately alkaline; clear wavy boundary.

3C—44 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; about 10 percent gravel and 2 percent cobbles; slightly effervescent; moderately alkaline.

The thickness of the sandy mantle ranges from 20 to 50 inches. The depth to the base of the argillic horizon ranges from 40 to more than 60 inches. The content of gravel ranges from 0 to 10 percent throughout the profile, and the content of cobbles ranges from 0 to 5 percent.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is sand.

The Bw horizon has hue of 7.5YR or 10YR and value and chroma of 3 to 6. It is sand, loamy sand, or loamy fine sand.

The E' horizon and the E part of the B/E horizon have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 4. They are sand, loamy sand, or loamy fine sand.

The Bt part of the 2B/E horizon and the 2Bt horizon have hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. They are sandy clay loam, loam, or clay loam.

The BC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. It is sand, loamy sand, sandy loam, or very fine sandy loam.

The 3C horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 2 to 5. It is sand or loamy sand.

Richter Series

The Richter series consists of somewhat poorly drained soils on lake plains and in glacial drainageways. These soils formed in sandy and loamy materials over stratified sandy and loamy deposits. Permeability is moderate. Slopes range from 0 to 3 percent.

Taxonomic classification: Coarse-loamy, mixed, semiactive, frigid Argic Endoaquods

Typical pedon of Richter loamy fine sand, 0 to 3 percent slopes, 30 feet south and 1,200 feet west of the northeast corner of sec. 10, T. 26 N., R. 8 E., Gustin Township, Alcona County, Michigan; USGS Lincoln, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 12.62 seconds N. and long. 83 degrees 26 minutes 56.49 seconds W., NAD 27:

A—0 to 8 inches; black (10YR 2/1) loamy fine sand, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; very friable; many fine and common medium roots; strongly acid; abrupt wavy boundary.

E—8 to 12 inches; light gray (10YR 7/2) loamy sand, white (10YR 8/2) dry; weak medium subangular blocky structure; very friable; common fine roots; moderately acid; clear broken boundary.

Bs—12 to 18 inches; brown (7.5YR 4/4) loamy sand; weak thick platy structure parting to weak fine subangular blocky; friable; common fine roots; common distinct brown (10YR 4/3) organic coatings; many coarse distinct strong brown (7.5YR 4/6) and many coarse faint dark reddish brown (5YR 3/3) masses of iron accumulation in the matrix; moderately acid; abrupt wavy boundary.

B/E—18 to 26 inches; about 80 percent brown (7.5YR 5/4) sandy loam (Bt); surrounded by pale brown (10YR 6/3) loamy sand, very pale brown (10YR 7/3) dry (E); moderate thick platy structure parting to moderate medium subangular blocky; friable; few fine roots; common medium distinct pinkish gray (7.5YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; moderately acid; clear wavy boundary.

- Bt—26 to 37 inches; brown (7.5YR 5/4) and reddish brown (5YR 5/4), stratified fine sandy loam and clay loam; weak thick platy structure parting to moderate fine angular blocky; friable; few fine roots; common faint reddish brown (5YR 5/3) clay films on faces of pedis; common fine prominent greenish gray (5GY 5/1) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.
- C—37 to 60 inches; pinkish gray (7.5YR 6/2) and reddish brown (5YR 5/3), stratified loamy sand and silt loam; massive; friable; about 5 percent gravel; few medium prominent greenish gray (5GY 6/1) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to carbonates ranges from 25 to 40 inches. The content of gravel ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The E horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 1 or 2. It is loamy sand or very fine sandy loam.

The Bs horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is loamy sand or sandy loam.

The E part of the B/E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. It is loamy sand, fine sandy loam, or very fine sandy loam.

The Bt part of the B/E horizon and the Bt horizon have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. The Bt part of the B/E horizon is sandy loam. The Bt horizon is stratified fine sandy loam to clay loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3. It is stratified loamy sand to silt loam.

Rubicon Series

The Rubicon series consists of excessively drained soils on moraines and outwash plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 18 percent.

Taxonomic classification: Sandy, mixed, frigid Entic Haplorthods

Typical pedon of Rubicon sand, 0 to 6 percent slopes, 1,200 feet south and 600 feet east of the northwest corner of sec. 8, T. 32 N., R. 1 E., Montmorency Township, Montmorency County, Michigan; USGS Silver Lake, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 10 minutes 50 seconds N. and long. 84 degrees 20 minutes 48 seconds W., NAD 27:

- A—0 to 4 inches; black (N 2.5/) sand, dark gray (N 4/) dry; 8 percent gray (N 6/) uncoated sand grains; weak medium granular structure; very friable; many fine and common medium and coarse roots; about 2 percent gravel and 1 percent cobbles; very strongly acid; abrupt wavy boundary.
- E—4 to 9 inches; brown (7.5YR 5/2) sand, pinkish white (7.5YR 8/2) dry; single grain; loose; common fine, medium, and coarse roots; about 2 percent gravel and 1 percent cobbles; very strongly acid; clear wavy boundary.
- Bs1—9 to 16 inches; dark brown (7.5YR 3/4) sand; weak medium subangular blocky structure; very friable; common fine and medium and few coarse roots; about 2 percent gravel and 1 percent cobbles; very strongly acid; gradual wavy boundary.
- Bs2—16 to 22 inches; strong brown (7.5YR 4/6) sand; weak medium subangular blocky structure; very friable; few fine and medium roots; about 2 percent gravel and 1 percent cobbles; strongly acid; gradual wavy boundary.
- BC—22 to 47 inches; yellowish brown (10YR 5/6) sand; single grain; loose; about 3 percent gravel and 1 percent cobbles; strongly acid; gradual wavy boundary.

C—47 to 80 inches; yellowish brown (10YR 5/4) sand; single grain; loose; about 6 percent gravel and 2 percent cobbles; strongly acid.

The depth to the C horizon ranges from 27 to 47 inches. The content of gravel ranges from 0 to 6 percent throughout the profile, and the content of cobbles ranges from 0 to 2 percent. The texture is sand throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 to 4 and chroma of 0 to 2. The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 1 to 3. The A and E horizons are dominantly sand, but the range includes loamy sand.

The Bs1 horizon has hue of 5YR or 7.5YR and value and chroma of 3 or 4. The content of ortstein ranges from 0 to 20 percent. The Bs2 horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 8.

The BC horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. The C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8.

Springport Series

The Springport series consists of poorly drained soils on lake plains. These soils formed in silty and clayey deposits. Permeability is slow or very slow. Slopes range from 0 to 2 percent.

Taxonomic classification: Fine, mixed, semiactive, frigid Typic Epiaquolls

Typical pedon of Springport silt loam, 1,700 feet north and 35 feet east of the southwest corner of sec. 15, T. 27 N., R. 3 W., west part of Comins Township, Oscoda County, Michigan; USGS Fairview, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 43 minutes 47.28 seconds N. and long. 84 degrees 04 minutes 15.7 seconds W., NAD 27:

- Ap1—0 to 4 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to strong fine and medium granular; friable; many very fine and fine and common medium roots; less than 1 percent gravel; neutral; abrupt wavy boundary.
- Ap2—4 to 9 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure parting to strong very fine subangular blocky; firm; common very fine and fine roots; 1 percent gravel; few fine and medium distinct gray (2.5Y 5/1) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; abrupt wavy boundary.
- Eg—9 to 11 inches; dark gray (10YR 4/1) silty clay, light gray (2.5Y 7/1) dry; weak very coarse prismatic structure parting to weak medium angular blocky; very firm; few very fine and fine roots; less than 1 percent gravel; common fine and medium prominent yellowish brown (10YR 5/6) and few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; slightly alkaline; abrupt broken boundary.
- Bg—11 to 16 inches; greenish gray (10Y 5/1) silty clay; weak very coarse prismatic structure parting to weak medium angular blocky; very firm; few very fine and fine roots; less than 1 percent gravel; many fine and medium prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; slightly alkaline; clear wavy boundary.
- Cg—16 to 48 inches; gray (5Y 6/1) silty clay loam; massive; firm; less than 1 percent gravel; common fine and medium prominent white (2.5Y 8/1) carbonate coatings; many medium and coarse prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; violently effervescent; moderately alkaline; gradual wavy boundary.

C—48 to 80 inches; brown (7.5YR 5/3 and 10YR 5/3), stratified silt loam and silty clay loam; weak very thin platy structure inherent from deposition; firm; few fine and medium prominent light gray (10YR 7/2) carbonate coatings to a depth of 55 inches; common medium and coarse prominent gray (N 6/) and greenish gray (10Y 6/1) iron depletions in the matrix; common medium and coarse distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; violently effervescent; moderately alkaline.

The depth to carbonates ranges from 15 to 25 inches. The content of gravel ranges from 0 to 1 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is dominantly silt loam, but the range includes silty clay loam.

The Eg horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay or silty clay loam.

The Bg horizon has hue of 7.5YR to 10Y, value of 4 or 5, and chroma of 1 or 2. It is silty clay or silty clay loam.

The C horizon has hue of 7.5YR to 5Y, value of 5 or 6, and chroma of 2 to 4. It is silty clay or silty clay loam. It is stratified silt loam and silty clay loam below a depth of 48 inches.

Tacoda Series

The Tacoda series consists of somewhat poorly drained soils on lake plains. These soils formed in sandy material over clayey deposits. Permeability is rapid in the upper sandy part and very slow in the lower part. Slopes range from 0 to 4 percent.

Taxonomic classification: Sandy, mixed, frigid Typic Epiaquods

Typical pedon of Tacoda sand, 0 to 3 percent slopes, 2,200 feet south and 400 feet west of the northeast corner of sec. 9, T. 21 N., R. 6 E., Sherman Township, Iosco County, Michigan; USGS National City, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 13 minutes 42 seconds N. and long. 83 degrees 42 minutes 17 seconds W., NAD 27:

A—0 to 3 inches; black (10YR 2/1) sand, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; extremely acid; abrupt smooth boundary.

E—3 to 15 inches; light gray (10YR 7/2) sand, white (10YR 8/2) dry; weak medium subangular blocky structure; very friable; common fine faint light brownish gray (10YR 6/2) iron depletions and common medium and fine distinct light yellowish brown (10YR 6/4) masses of iron accumulation in the matrix; extremely acid; abrupt smooth boundary.

Bs—15 to 23 inches; dark brown (7.5YR 3/4) sand; moderate medium subangular blocky structure; friable; few medium distinct yellowish red (5YR 4/6) masses of iron accumulation in the matrix; extremely acid; clear wavy boundary.

Bw—23 to 35 inches; very pale brown (10YR 7/4) and light yellowish brown (10YR 6/4) sand; single grain; loose; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; extremely acid; clear wavy boundary.

BC—35 to 45 inches; brown (10YR 4/3) sand; single grain; loose; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; about 8 percent gravel; neutral; abrupt smooth boundary.

2C1—45 to 60 inches; brown (7.5YR 4/2) silty clay; massive with widely spaced vertical fractures; firm; strongly effervescent; slightly alkaline; gradual wavy boundary.

2C2—60 to 80 inches; brown (7.5YR 5/2) silty clay; massive with widely spaced vertical fractures; firm; common medium faint brown (7.5YR 4/2) iron depletions in the matrix; strongly effervescent; slightly alkaline.

The depth to the clayey material and the depth to carbonates range from 40 to 60 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2. It is sand.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 2 or 3. It is sand.

The Bs horizon has hue of 7.5YR, value of 3 or 4, and chroma of 4. Some pedons have a Bs2 horizon, which has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 6. It contains 0 to 25 percent ortstein. It is sand.

The Bw horizon has hue of 10YR, value of 6 or 7, and chroma of 4. It is sand.

The BC horizon has hue of 10YR or 7.5YR, value of 4 to 7, and chroma of 3 to 6. It is sand.

The 2C horizon has hue of 7.5YR, value of 4 or 5, and chroma of 2. It is silty clay or clay.

Tawas Series

The Tawas series consists of very poorly drained soils in depressions on moraines, outwash plains, and lake plains. These soils formed in organic material over sandy deposits. Permeability ranges from moderately slow to moderately rapid in the organic material and is rapid in the underlying sandy material. Slopes range from 0 to 2 percent.

Taxonomic classification: Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists

Typical pedon of Tawas muck, in an area of Tawas-Lupton mucks, 850 feet south and 40 feet west of the northeast corner of sec. 36, T. 28 N., R. 1 E., north part of Greenwood Township, Oscoda County, Michigan; USGS Comstock Hills, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 46 minutes 51.25 seconds N. and long. 84 degrees 15 minutes 08.35 seconds W., NAD 27:

Oa1—0 to 7 inches; muck, black (10YR 2/1) broken face and rubbed; about 30 percent fiber, 5 percent rubbed; moderate medium granular structure; very friable; many fine and medium and few coarse roots; slightly acid; clear smooth boundary.

Oa2—7 to 15 inches; muck, black (7.5YR 2.5/1) broken face and rubbed; about 40 percent fiber, 5 percent rubbed; weak medium subangular blocky structure; very friable; 10 percent dark brown (10YR 3/3) woody fragments; neutral; clear smooth boundary.

Oa3—15 to 24 inches; muck, black (10YR 2/1) broken face and rubbed; about 25 percent fibers, 10 percent rubbed; weak medium subangular blocky structure; very friable; about 5 percent dark brown (7.5YR 3/3) woody fragments; neutral; abrupt smooth boundary.

Cg1—24 to 30 inches; dark gray (10YR 4/1) mucky sand; single grain; loose; neutral; clear smooth boundary.

Cg2—30 to 55 inches; dark grayish brown (2.5Y 4/2) sand; single grain; loose; about 12 percent gravel; neutral; clear smooth boundary.

Cg3—55 to 80 inches; grayish brown (10YR 5/2) gravelly sand; single grain; loose; 20 percent gravel; slightly effervescent; moderately alkaline.

The thickness of the organic material ranges from 16 to 50 inches.

The Oa horizons have hue of 5YR to 10YR or are neutral in hue. They have value of 2 or 3 and chroma of 0 or 1. The unrubbed fiber content ranges from 10 to 40 percent.

The C horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 1 to 3. It is sand or gravelly sand. The content of gravel ranges from 0 to 20 percent.

Thunderbay Series

The Thunderbay series consists of poorly drained soils on flood plains. These soils formed in silty material over stratified loamy, silty, and organic deposits underlain by sandy deposits. Permeability is moderate or moderately rapid in the loamy part and rapid in the sandy part. Slopes range from 0 to 2 percent.

Taxonomic classification: Coarse-loamy, mixed, semiactive, frigid Fluvaquentic Endoaquolls

Typical pedon of Thunderbay silt loam, in an area of Colonville-Thunderbay complex, 0 to 3 percent slopes, occasionally flooded, 1,850 feet south and 100 feet west of the northeast corner of sec. 3, T. 26 N., R. 1 E., northwest part of Big Creek Township, Oscoda County, Michigan; USGS Red Oak, Michigan, 7.5-minute quadrangle; lat. 44 degrees 40 minutes 32.78 seconds N. and long. 84 degrees 17 minutes 35.14 seconds W., NAD 27:

- A—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak moderate granular structure; very friable; many very fine, fine, medium, and coarse roots; many fine and medium prominent strong brown (7.5YR 4/6, 5/6, and 5/8) and common fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix in the lower part of the horizon; slightly alkaline; clear wavy boundary.
- Cg—10 to 18 inches; dark gray (2.5Y 4/1) silt loam; massive; friable; common very fine, fine, and medium roots; many fine and medium prominent strong brown (7.5YR 4/6, 5/6, and 5/8) and common fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; slightly alkaline; clear wavy boundary.
- Oa—18 to 26 inches; muck, black (10YR 2/1) broken face, black (10YR 2/1) rubbed; about 5 percent fiber, less than 1 percent rubbed; thin layers ($\frac{1}{4}$ to 1 inch thick) of gray (2.5Y 5/1) and dark gray (2.5Y 4/1) silt loam and very fine sandy loam; massive; very friable; few very fine, fine, and medium roots; slightly alkaline; clear wavy boundary.
- C_g—26 to 37 inches; dark gray (2.5Y 4/1) and gray (2.5Y 5/1), stratified silt, silt loam, and very fine sandy loam; thin ($\frac{1}{4}$ to $\frac{1}{2}$ inch thick) layers of black (10YR 2/1) muck; massive; very friable; few very fine, fine, and medium roots; many fine and medium prominent strong brown (7.5YR 4/6, 5/6, and 5/8) and many fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; slightly alkaline; abrupt wavy boundary.
- 2Cg1—37 to 53 inches; grayish brown (2.5Y 5/2) and dark grayish brown (2.5Y 4/2) sand; single grain; loose; 5 percent gravel; few fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline; gradual wavy boundary.
- 2Cg2—53 to 80 inches; grayish brown (2.5Y 5/2) gravelly sand; single grain; loose; 20 percent gravel; strongly effervescent; moderately alkaline.

The thickness of the mollic epipedon ranges from 10 to 21 inches. The depth to the sandy layers ranges from 20 to 50 inches. The content of gravel ranges from 0 to 2 percent in the loamy layers and from 0 to 20 percent in the sandy layers.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Prominent iron accumulations are in the lower part of the mollic epipedon.

The Cg horizon has hue of 5YR to 5GY, value of 3 to 5, and chroma of 1 or 2. The textures in the upper part of the C horizon are silt, silt loam, very fine sandy loam, and loam. The textures in the lower part of the C horizon are sand and gravelly sand.

Typic Endoaquods

Typic Endoaquods are very 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.

Taxonomic classification: Mixed, frigid Typic Endoaquods

Reference pedon of Typic Endoaquods, nearly level, 850 feet north and 160 feet west of the southeast corner of sec. 13, T. 25 N., R. 7 E., Mikado Township, Alcona County, Michigan; USGS Sprinkler Lake, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 33 minutes 25.53 seconds N. and long. 83 degrees 31 minutes 25.85 seconds W., WGS 84:

- Oi—0 to 1 inch; slightly decomposed plant material, very dark gray (7.5YR 3/1) broken and rubbed; about 90 percent fibers broken and 70 percent rubbed; many very fine to coarse roots; extremely acid; abrupt smooth boundary.
- Oe—1 to 5 inches; mucky peat, black (7.5YR 2.5/1) broken face and rubbed; about 80 percent fibers broken and 35 percent rubbed; black (10YR 2/1) dry; weak fine granular structure; friable; many very fine to coarse roots; about 5 percent charcoal; extremely acid; abrupt smooth boundary.
- E—5 to 11 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; single grain; loose; few very fine to coarse roots; extremely acid; abrupt irregular boundary.
- Bs1—11 to 15 inches; dark reddish brown (5YR 3/4) sand; strong coarse angular blocky structure; firm; many very fine to coarse roots; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; extremely acid; clear wavy boundary.
- Bs2—15 to 19 inches; strong brown (7.5YR 4/6) sand; moderate medium angular blocky structure; firm; common fine to medium roots; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; very strongly acid; clear wavy boundary.
- C1—19 to 37 inches; light yellowish brown (10YR 6/4) sand; weak medium subangular blocky structure; very friable; few fine to coarse roots; many fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.
- C2—37 to 80 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; strongly acid.

An organic layer, 4 to 7 inches thick, is typically at the surface. It is dominantly muck or mucky peat. It has hue of 5YR to 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 or 2. It is sand, loamy sand, or fine sand.

The Bs horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 4 to 6. It is sand, loamy sand, or fine sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is sand, loamy sand, or fine sand.

Typic Udipsamments

Typic Udipsamments are moderately well drained to excessively drained soils on outwash plains, stream terraces, and moraines. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 45 percent.

Taxonomic classification: Mixed, frigid Typic Udipsamments

Reference pedon of Typic Udipsamments, nearly level and undulating, 2,620 feet north and 20 feet east of the southwest corner of sec. 4, T. 26 N., R. 5 E., Mitchell Township, Alcona County, Michigan; USGS Curran, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 30 seconds N. and long. 83 degrees 50 minutes 49 seconds W., WGS 84:

- Oi—0 to 1 inch; undecomposed hardwood and coniferous leaf litter; abrupt smooth boundary.
- A—1 to 3 inches; very dark gray (10YR 3/1) sand, dark grayish brown (10YR 4/2) dry; weak medium granular structure; very friable; many very fine and fine roots; strongly acid; abrupt wavy boundary.
- E—3 to 5 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; weak medium subangular blocky structure; very friable; strongly acid; abrupt wavy boundary.
- Bw—5 to 23 inches; dark yellowish brown (10YR 4/4) sand; weak coarse subangular blocky structure; very friable; strongly acid; clear wavy boundary.
- BC—23 to 41 inches; yellowish brown (10YR 5/6) sand; single grain; loose; strongly acid; gradual wavy boundary.
- C—41 to 180 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; strongly acid.

The depth to the C horizon ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It is sand or loamy sand. Some pedons do not have an E horizon.

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

The C horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 4 to 6. It is sand or coarse sand.

Deep and very deep water table phases are recognized. A banded and loamy substratum phase also is recognized.

Udipsamments

Udipsamments are well drained, somewhat excessively drained, and excessively drained soils on outwash plains, moraines, deltas, and lake plains. These soils formed in sandy deposits. Permeability is rapid. Slopes range from 0 to 8 percent.

Taxonomic classification: Udipsamments

Typical pedon of Udipsamments, 1,950 feet west and 500 feet south of the northeast corner of sec. 16, T. 32 N., R. 2 E., Montmorency Township, Montmorency County, Michigan; USGS Lake Geneva, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 10 minutes 09 seconds N. and long. 84 degrees 11 minutes 36 seconds W., NAD 27:

- B—0 to 7 inches; dark yellowish brown (10YR 4/4) sand; weak fine subangular blocky structure; very friable; common very fine and fine and few medium and coarse roots; 5 percent gravel; extremely acid; clear wavy boundary.
- BC—7 to 13 inches; yellowish brown (10YR 5/6) sand; weak fine and medium subangular blocky structure; very friable; few very fine roots; 1 percent gravel; extremely acid; clear wavy boundary.
- C1—13 to 65 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; 1 percent gravel; extremely acid; clear wavy boundary.

C2—65 to 81 inches; pale brown (10YR 6/3) sand; single grain; loose; few strong brown (7.5YR 5/6) color bands $\frac{1}{16}$ inch thick; 1 percent gravel; very strongly acid.

Udorthents

Udorthents are well drained, somewhat excessively drained, and excessively drained soils on outwash plains, moraines, deltas, and lake plains. These soils formed in loamy deposits. Permeability ranges from rapid to slow. Slopes range from 0 to 8 percent.

Taxonomic classification: Udorthents

Typical pedon of Udorthents, 2,600 feet east and 1,600 feet north of the southwest corner of sec. 24, T. 31 N., R. 4 E., Hillman Township, Montmorency County, Michigan; USGS Hillman, Michigan, 7.5-minute topographic quadrangle; lat. 45 degrees 03 minutes 49 seconds N. and long. 83 degrees 53 minutes 20 seconds W., NAD 27:

- A—0 to 42 inches; dark grayish brown (10YR 4/2) sandy loam; moderate medium granular structure; very friable; 8 percent gravel; 5 percent cobbles; neutral; clear irregular boundary.
- B/E—42 to 48 inches; 70 percent reddish brown (5YR 4/4) clay loam (Bt); strong medium subangular blocky structure; friable; surrounded by pinkish gray (5YR 6/2) loamy sand (E); weak medium subangular blocky structure; friable; 8 percent gravel and 5 percent cobbles; neutral; clear wavy boundary.
- Bt—48 to 54 inches; reddish brown (5YR 4/4) clay loam; strong medium subangular blocky structure; firm; many prominent reddish brown (5YR 4/3) clay films on faces of peds; 8 percent gravel and 5 percent cobbles; slightly alkaline; clear wavy boundary.
- C—54 to 80 inches; brown (10YR 5/3) sandy loam; weak medium subangular blocky structure; very friable; 8 percent gravel and 5 percent cobbles; moderately alkaline.

The depth to the C material ranges from 0 to 60 inches. The textures are variable throughout and range from sandy loam to clay.

Wakeley Series

The Wakeley series consists of poorly drained soils on lake plains and outwash plains. These soils formed in sandy material over clayey deposits. Permeability is rapid in the sandy material and slow or very slow in the underlying clayey material. Slopes range from 0 to 2 percent.

Taxonomic classification: Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiaquents

Typical pedon of Wakeley muck, in an area of Wakeley-Allendale complex, 0 to 3 percent slopes, 2,620 feet north and 1,325 feet west of the southeast corner of sec. 3, T. 26 N., R. 2 E., north part of Big Creek Township, Oscoda County, Michigan; USGS Mio, Michigan, 7.5-minute topographic quadrangle; lat. 44 degrees 40 minutes 26.34 seconds N. and long. 84 degrees 10 minutes 35.53 seconds W., NAD 27:

- Oa—0 to 7 inches; muck, black (10YR 2/1) broken face and rubbed; 15 percent fiber, less than 1 percent rubbed; moderate medium granular structure; very friable; many fine, medium, and coarse roots; neutral; abrupt wavy boundary.
- C—7 to 22 inches; light olive brown (2.5Y 5/3) sand (uncoated sand grains); weak coarse subangular blocky structure; very friable; few fine and medium roots; about 6 percent gravel; many fine and medium prominent yellowish brown (10YR 5/8)

and strong brown (7.5YR 5/6 and 5/8), many fine and medium distinct light olive brown (2.5Y 5/6), and many fine and medium prominent olive yellow (2.5Y 6/8) masses of iron accumulation in the matrix; neutral; abrupt wavy boundary.

2Cg1—22 to 29 inches; dark gray (2.5YR 4/1) clay; massive; firm; about 1 percent gravel; few fine prominent light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

2Cg2—29 to 80 inches; gray (2.5YR 5/1) silty clay; massive; firm; common fine and medium prominent bluish gray (10B 5/1) and greenish gray (5G 6/1) iron depletions in the matrix; common fine prominent light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) and common medium and coarse prominent light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

The depth to the clayey materials ranges from 20 to 40 inches. The content of gravel ranges from 0 to 10 percent in the sandy material and from 0 to 5 percent in the clayey material.

The Oa horizon has hue of 10YR or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 2.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is sand.

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

Formation of the Soils

This section describes the major factors and processes of soil formation and relates them to the soils in the survey area.

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 others. 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 Oscoda 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 Oscoda 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 glacial till have sharp corners, indicating that they have not been worn by water. The glacial till in Oscoda County generally is calcareous sandy loam and loam. Ossineke soils formed in glacial till. Typically, they 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. Grayling 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 suspended them. Annalake soils are examples of sandy soils that formed in parent material deposited in sandbars on a shallow lake bottom. Springport soils are examples of fine textured soils that formed in parent material deposited on a deep lake bottom.

Alluvial material has been deposited by floodwater of present streams in recent time. The texture of this material depends on the speed of the water that deposited the material. Ausable soils are 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. Tawas soils are examples of soils that formed in organic material.

Plant and Animal Life

Green plants have been the principal organism influencing the soils in Oscoda 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 material 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 vegetation in Oscoda 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 Grayling and Graycalm soils, were covered with northern pin oak and jack pine. The very poorly drained soils were covered with cedar, black spruce, and aspen. Tawas and Leafriver 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 on 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 Oscoda County is cool and humid. Presumably, it is similar to the climate under which the soils formed. The soils in Oscoda 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 Huron. The minor differences in the soils in Oscoda County are partially the result of climatic differences.

Relief

Relief, or topography, has had a marked influence on the formation of the soils in Oscoda County through its influence on natural drainage, erosion, plant cover, and soil temperature. Slopes in the survey area range from 0 to 45 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. Blue Lake soils are examples of well drained, well aerated soils; Springport 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 Oscoda County range from young to mature. The glacial deposits in which many of the soils formed have been exposed to the 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. Ausable soils, which formed in alluvial materials, are young soils. Blue Lake 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 process 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 Oscoda 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 have 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 Oscoda County, the content of organic matter in the surface layer ranges from high to low. For example, Springport soils have a high content of organic matter in the surface layer; Grayling 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 Oscoda County are moderately or strongly leached. Coppler soils are leached of carbonates to a depth of 26 to 34 inches. Blue Lake soils are leached to a depth of more than 80 inches. This difference in the depth of leaching is a result of time, relief, and parent material.

The reduction and transfer of iron, a process called gleying, is evident in the 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. Springport 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. Ossineke 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. Blue Lake and Islandlake soils are examples of soils in which translocated iron, aluminum, and humus have affected the B horizon.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

- Ablation till.** Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.
- Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.
- Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.
- Alluvium.** Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.
- Alpha,alpha-dipyridyl.** A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.
- Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.
- Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.
- Aspect.** The direction toward which a slope faces. Also called slope aspect.
- Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.
- Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:
- | | |
|-----------------|--------------|
| Very low | 0 to 3 |
| Low | 3 to 6 |
| Moderate | 6 to 9 |
| High | 9 to 12 |
| Very high | more than 12 |
- Backslope.** The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.
- Basal till.** Compact till deposited beneath the glacial ice.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

- Blowout.** A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.
- Blowout (map symbol).** A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. The areas are typically less than 3 acres.
- Board foot.** A unit of measurement represented by a board 1 foot wide, 1 foot long, and 1 inch thick.
- Bog.** Waterlogged, spongy ground, consisting primarily of mosses, containing acidic, decaying vegetation (such as sphagnum, sedges, and heaths) that develops into peat.
- Borrow pit (map symbol).** An open excavation from which soil and underlying material have been removed, usually for construction purposes. The areas are typically less than 3 acres.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that 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.
- Catsteps.** See Terracettes.
- Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** See Redoximorphic features.
- 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.
- Clay spot (map symbol).** An area in which the surface layer is silty clay or clay. Typically 1 to 2 acres.

- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Closed depression (map symbol).** A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and is without a natural outlet for surface drainage. Typically 1 to 3 acres.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.
- COLE (coefficient of linear extensibility).** See Linear extensibility.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Concretions.** See Redoximorphic features.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.
- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Cord.** A unit of measurement of stacked wood. A standard cord occupies 128 cubic feet with dimensions of 4 feet by 4 feet by 8 feet.
- Corrosion (geomorphology).** A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.
- Corrosion (soil survey interpretations).** 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.
- Crown.** The upper part of a tree or shrub, including the living branches and their foliage.
- Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
- Cut or fill area (map symbol).** A small area where the original soil profile has been altered by the addition or removal of more than about 1 foot of soil material. The area is typically less than 3 acres.
- 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.
- Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.
- Depression.** Any relatively sunken part of the earth's surface; especially a low-lying area surrounded by higher ground. A closed depression has no natural outlet for surface drainage. An open depression has a natural outlet for surface drainage.
- 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.
- Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.
- Disintegration moraine.** A drift topography characterized by chaotic mounds and pits, generally randomly oriented, developed in supraglacial drift by collapse and flow as the underlying stagnant ice melted. Slopes may be steep and unstable. Abrupt changes between materials of differing lithology are common.
- 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.
- Drainageway.** A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.
- Drift.** A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified

material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Dry spot (map symbol). A small area of moderately well drained to excessively drained soil within a poorly drained or very poorly drained area of mineral soil, or a somewhat poorly drained to excessively drained soil within a map unit consisting mainly of organic soil. Each symbol represents one area or several closely grouped areas totaling less than 4 acres.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

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 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.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion.

Escarpment, bedrock (map symbol). A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Exposed material is hard or soft bedrock.

- Escarpment, nonbedrock (map symbol).** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Exposed material is nonsoil or very shallow soil.
- Esker.** A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.
- 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.
- 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.
- Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.
- Flood plain.** The nearly level plain that borders a stream and is subject to flooding unless protected artificially.
- Flood-plain landforms.** A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.
- Flood-plain splay.** A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.
- Flood-plain step.** An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.
- Fluvial.** Of or pertaining to rivers or streams; produced by stream or river action.
- Footslope.** The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

- Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Glacial outwash.** Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.
- Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.
- Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded 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.
- Gravel pit (map symbol).** An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 1 to 3 acres.
- Gravelly soil material.** Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Gravelly spot (map symbol).** An area where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter. The area is typically 1 to 3 acres.
- Green manure crop (agronomy).** A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. 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.
- Gully (map symbol).** A small channel with steep sides, cut by running water, through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Head slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A generic term for an elevated area 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. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

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.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasesers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Island (map symbol). A small area of mineral soil within a body of water and above the normal water level. The island is a relatively permanent feature. The areas are typically less than 3 acres.

Kame. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lamellae. Thin layers in the soil where illuviated clay particles have accumulated. These layers generally form in sandy soils and are commonly irregular or discontinuous.

Landfill (map symbol). An area of accumulated waste products of human habitation. Can be above or below natural ground level. The area is typically less than 3 acres.

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Levee (map symbol). An embankment built to confine or control water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $1/3$ - or $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marsh or swamp (map symbol). A water-saturated, very poorly drained area, intermittently or permanently covered by water. Marsh areas are dominantly covered by sedges, cattails, or rushes. Swamps are dominantly covered by trees or shrubs. Not used in map units where poorly drained or very poorly drained soils are the named components. Typically 1 to 3 acres.

Masses. See Redoximorphic features.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mine or quarry (map symbol). An open excavation from which soil and underlying material are removed, exposing the bedrock. Also used to denote surface openings to underground mines. The areas are typically less than 3 acres.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol). Small manmade areas of water that are used for industrial, sanitary, or mining applications and that contain water most of the year. Typically 1 to 2 acres.

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. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

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.)

Nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan, fragipan, claypan, plowpan, and traffic pan.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Perennial water (map symbol). A small, natural or constructed lake, pond, or pit that contains water most of the year. The areas are typically 1 to 2 acres.

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:

Impermeable	less than 0.0015 inch
Very slow	0.0015 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.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

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.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

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.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

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 as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
 - A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
 - B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
 - C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
 - A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
 - B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletons).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

- Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.
- Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.
- Rock outcrop (map symbol).** An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock. The areas are typically less than 3 acres.
- Root zone.** The part of the soil that can be penetrated by plant roots.
- Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.
- Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
- Sandstone.** Sedimentary rock containing dominantly sand-sized particles.
- Sandy spot (map symbol).** An area where the surface layer contains more than 75 percent sand and where the named soils of the surrounding map unit have less than about 25 percent sand. The area is typically 1 to 3 acres.
- 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.
- Saturated hydraulic conductivity (Ksat).** See Permeability.
- Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
- Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.
- Sedimentary rock.** A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.
- Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)
- Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
- Severely eroded spot (map symbol).** An area where, on the average, 75 percent or more of the original surface layer has been lost as a result of accelerated erosion. Typically 1 to 3 acres.
- Shale.** Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.
- Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
- Short steep slope (map symbol).** A narrow area of soil that is at least two slope classes steeper than the surrounding map unit.
- Shoulder.** The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.
- 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.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

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. For map units 13 through 144C and 307B through 513A, the slope classes are defined as follows:

Nearly level	0 to 3 percent
Nearly level and undulating	0 to 6 percent
Gently rolling	6 to 12 percent
Rolling	6 to 18 percent
Hilly	12 to 18 percent
Steep	18 to 45 percent
Very steep	45 percent and higher

For map units 200 through 282, the slope classes are defined as follows:

Nearly level	0 to 3 percent
Nearly level and undulating	0 to 6 percent
Rolling	6 to 18 percent
Hilly	18 to 30 percent
Steep	30 to 45 percent

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in 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.

Spoil area (map symbol). Piles of earthy materials, either smoothed or uneven, resulting from human activity. The areas are typically 1 to 2 acres.

Stone line. In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

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.

Stony spot (map symbol). An area where 0.01 to 3.0 percent of the surface is covered with rock fragments more than 10 inches in diameter. Typically 1 to 3 acres.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

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).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swale. A slight depression in the midst of generally level land. A shallow depression in an undulating ground moraine caused by uneven glacial deposition.

Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation). 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 (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes. Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

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. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Very stony spot (map symbol). An area in which more than 3.0 percent of the surface is covered by rock fragments more than 10 inches in diameter within an area that does not have rock fragments on the surface. The area is typically less than 3 acres.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol). An area of somewhat poorly drained to very poorly drained soil at least two drainage classes wetter than the named soils in the surrounding map unit. The area is typically 1 to 3 acres.

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 1971-2000 at Mio Hydro Plant, 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----	27.5	8.6	18.0	49	-23	1	1.61	0.98	2.18	4	13.2
February---	31.0	9.1	20.0	54	-26	3	1.14	.59	1.62	4	7.6
March-----	41.0	18.3	29.6	70	-15	32	1.74	.78	2.66	5	8.2
April-----	54.2	30.4	42.3	81	10	151	2.09	1.26	2.86	5	2.4
May-----	68.2	40.8	54.5	90	24	448	2.37	1.44	3.27	6	.3
June-----	76.7	50.2	63.5	94	32	704	2.62	1.39	3.80	5	.0
July-----	81.6	55.2	68.4	96	39	878	2.96	1.74	4.10	5	.0
August-----	78.8	53.3	66.1	93	36	806	3.49	1.77	5.03	7	.0
September--	70.1	45.5	57.8	88	28	528	2.88	1.78	3.98	6	.0
October----	58.0	35.8	46.9	79	19	238	2.25	1.21	3.06	5	.2
November---	43.7	27.4	35.6	68	4	51	1.91	1.03	2.74	5	3.5
December---	32.2	16.1	24.2	55	-15	6	1.65	.82	2.47	5	9.9
Yearly:											
Average---	55.3	32.6	43.9	---	---	---	---	---	---	---	---
Extreme---	103	-38	---	97	-27	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,846	26.71	23.00	29.85	62	45.3

* 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 Mio Hydro Plant,
 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 5	May 21	June 10
2 years in 10 later than--	May 1	May 17	June 5
5 years in 10 later than--	Apr. 24	May 10	May 26
First freezing temperature in fall:			
1 year in 10 earlier than--	Sept. 29	Sept. 20	Sept. 10
2 years in 10 earlier than--	Oct. 6	Sept. 25	Sept. 14
5 years in 10 earlier than--	Oct. 20	Oct. 5	Sept. 21

Table 3.--Growing Season
 (Recorded in the period 1971-2000 at Mio Hydro
 Plant, Michigan)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F Days	Higher than 28 °F Days	Higher than 32 °F Days
9 years in 10	154	130	101
8 years in 10	162	136	107
5 years in 10	178	147	117
2 years in 10	194	159	128
1 year in 10	203	165	133

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
13	Tawas-Lupton mucks-----	5,999	1.6
14	Dawson-Loxley peats-----	856	0.2
15A	Croswell-Au Gres sands, 0 to 3 percent slopes-----	1,414	0.4
16B	Graycalm sand, 0 to 6 percent slopes-----	11,077	3.0
16C	Graycalm sand, 6 to 12 percent slopes-----	6	*
16D	Graycalm sand, 12 to 18 percent slopes-----	11	*
17A	Croswell sand, 0 to 3 percent slopes-----	153	*
17B	Croswell sand, 0 to 6 percent slopes-----	5,200	1.4
18A	Au Gres sand, 0 to 3 percent slopes-----	545	0.1
19	Leafriver muck-----	235	*
20B	Graycalm-Grayling sands, 0 to 6 percent slopes-----	32,002	8.7
20D	Graycalm-Grayling sands, 6 to 18 percent slopes-----	10,605	2.9
20F	Graycalm-Grayling sands, 18 to 45 percent slopes-----	2,802	0.8
21D	Graycalm-Klacking complex, 6 to 18 percent slopes-----	7	*
23	Ausable-Bowstring mucks, frequently flooded-----	314	*
24A	Kinross-Au Gres complex, 0 to 3 percent slopes-----	114	*
26B	Cublake sand, 0 to 6 percent slopes-----	1	*
27A	Tacoda sand, 0 to 3 percent slopes-----	1	*
31B	Klacking loamy sand, 0 to 6 percent slopes-----	54	*
31C	Klacking loamy sand, 6 to 12 percent slopes-----	16	*
31D	Klacking loamy sand, 12 to 18 percent slopes-----	15	*
32B	Kellogg sand, 0 to 6 percent slopes-----	2,322	0.6
32C	Kellogg sand, 6 to 12 percent slopes-----	268	*
36B	Annalake loamy very fine sand, 0 to 6 percent slopes-----	3	*
37A	Richter loamy fine sand, 0 to 3 percent slopes-----	1	*
41C	McGinn loamy sand, 6 to 12 percent slopes-----	8	*
44B	Ossineke fine sandy loam, 0 to 6 percent slopes-----	1,333	0.4
44C	Ossineke fine sandy loam, 6 to 12 percent slopes-----	704	0.2
47D	Graycalm sand, 6 to 18 percent slopes-----	6,059	1.7
47F	Graycalm sand, 18 to 45 percent slopes-----	1,680	0.5
50B	Au Gres-Kinross-Croswell complex, 0 to 6 percent slopes-----	4	*
51	Tawas-Leafriver mucks-----	2,993	0.8
53B	Negwegon silt loam, 2 to 6 percent slopes-----	903	0.2
53C	Negwegon silt loam, 6 to 12 percent slopes-----	288	*
54A	Algonquin silt loam, 0 to 3 percent slopes-----	2,259	0.6
56B	Nester loam, 0 to 6 percent slopes-----	115	*
56C	Nester loam, 6 to 12 percent slopes-----	64	*
57B	Kawkawlin loam, 1 to 4 percent slopes-----	59	*
58A	Wakeley-Allendale complex, 0 to 3 percent slopes-----	6,076	1.7
67A	Bowers-Deerheart complex, 0 to 3 percent slopes-----	474	0.1
70	Lupton muck-----	11	*
71	Tawas muck-----	55	*
75B	Rubicon sand, 0 to 6 percent slopes-----	35	*
75D	Rubicon sand, 6 to 18 percent slopes-----	7	*
78	Pits, borrow-----	188	*
81B	Grayling sand, 0 to 6 percent slopes-----	15,589	4.3
81D	Grayling sand, 6 to 18 percent slopes-----	906	0.2
81E	Grayling sand, 18 to 35 percent slopes-----	539	0.1
81F	Grayling sand, 18 to 45 percent slopes-----	51	*
82B	Udorthents, loamy, nearly level and undulating-----	110	*
83B	Udipsamments, nearly level and undulating-----	1,396	0.4
86	Histosols and Aquepts, ponded-----	1,719	0.5
87	Ausable muck, frequently flooded-----	185	*
90B	Chinwhisker sand, 0 to 4 percent slopes-----	685	0.2
93B	Tacoda-Wakeley complex, 0 to 4 percent slopes-----	10	*
94F	Klacking-McGinn loamy sands, 8 to 50 percent slopes, dissected-----	15	*
96D2	Mongo silty clay loam, 12 to 18 percent slopes, eroded-----	6	*
98C	Graycalm sand, pitted outwash, 0 to 12 percent slopes-----	65	*
110D	Mongo silt loam, 12 to 18 percent slopes-----	582	0.2
110F	Mongo silt loam, 25 to 45 percent slopes-----	563	0.2
111B	Kellogg loamy sand, 0 to 6 percent slopes-----	46	*
111C	Kellogg loamy sand, 6 to 12 percent slopes-----	11	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
116B	Mancelona sand, 0 to 6 percent slopes-----	5	*
116C	Mancelona sand, 6 to 12 percent slopes-----	22	*
116D	Mancelona sand, 12 to 18 percent slopes-----	2	*
116E	Mancelona sand, 18 to 35 percent slopes-----	8	*
123D	Klacking sand, 6 to 18 percent slopes-----	424	0.1
125B	Melita sand, 0 to 6 percent slopes-----	15	*
144B	Perecheney sand, 0 to 6 percent slopes-----	369	0.1
144C	Perecheney sand, 6 to 12 percent slopes-----	127	*
200	Borrow source-----	71	*
210B	Grayling sand, nearly level and undulating-----	10,216	2.8
210C	Grayling sand, rolling-----	5,845	1.6
210D	Grayling sand, hilly-----	3,954	1.1
210E	Grayling sand, steep-----	5,876	1.6
211B	Grayling, banded substratum-Graycalm sands, nearly level and undulating-----	22,663	6.2
211C	Grayling, banded substratum-Graycalm sands, rolling-----	14,676	4.0
211D	Grayling, banded substratum-Graycalm sands, hilly-----	6,004	1.6
211E	Grayling, banded substratum-Graycalm sands, steep-----	4,942	1.4
212B	Grayling sand, very deep water table, nearly level and undulating-----	4,200	1.1
213B	Graycalm sand, nearly level and undulating-----	3,538	1.0
213C	Graycalm sand, rolling-----	2,097	0.6
213D	Graycalm sand, hilly-----	644	0.2
214B	Oxyaquic Udipsamments, nearly level and undulating-----	749	0.2
215B	Typic Udipsamments, loamy substratum, nearly level and undulating-----	579	0.2
215C	Typic Udipsamments, loamy substratum, rolling-----	411	0.1
215D	Typic Udipsamments, loamy substratum, hilly-----	102	*
220B	Typic Udipsamments, nearly level and undulating-----	180	*
220C	Typic Udipsamments, rolling-----	175	*
220D	Typic Udipsamments, hilly-----	128	*
220E	Typic Udipsamments, steep-----	106	*
221B	Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, nearly level and undulating-----	4,690	1.3
221C	Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, rolling-----	6,811	1.9
221D	Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, hilly-----	6,220	1.7
221E	Typic Udipsamments, banded substratum-Lamellic Udipsamments complex, steep-----	8,034	2.2
222B	Typic Udipsamments, very deep water table, nearly level and undulating-----	1,653	0.5
223B	Graycalm-Grayling sands, nearly level and undulating-----	1,760	0.5
223C	Graycalm-Grayling sands, rolling-----	1,553	0.4
223D	Graycalm-Grayling sands, hilly-----	1,624	0.4
223E	Graycalm-Grayling sands, steep-----	608	0.2
224B	Croswell sand, nearly level and undulating-----	899	0.2
225B	Entic Haplorthods, sandy, loamy substratum, nearly level and undulating-----	1,795	0.5
225C	Entic Haplorthods, sandy, loamy substratum, rolling-----	1,439	0.4
225D	Entic Haplorthods, sandy, loamy substratum, hilly-----	589	0.2
225E	Entic Haplorthods, sandy, loamy substratum, steep-----	480	0.1
230C	Entic Haplorthods-Alfic Haplorthods complex, sandy, rolling-----	15	*
230D	Entic Haplorthods-Alfic Haplorthods complex, sandy, hilly-----	77	*
230E	Entic Haplorthods-Alfic Haplorthods complex, sandy, steep-----	18	*
231B	Lamellic Haplorthods-Alfic Haplorthods complex, sandy, nearly level and undulating-----	391	0.1
231C	Lamellic Haplorthods-Alfic Haplorthods complex, sandy, rolling-----	340	*
231D	Lamellic Haplorthods-Alfic Haplorthods complex, sandy, hilly-----	313	*
231E	Lamellic Haplorthods-Alfic Haplorthods complex, sandy, steep-----	39	*
232B	Entic Haplorthods-Alfic Haplorthods complex, sandy, very deep water table, nearly level and undulating-----	146	*
232D	Entic Haplorthods-Alfic Haplorthods complex, sandy, very deep water table, hilly-----	18	*
233B	Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, nearly level and undulating-----	786	0.2
233C	Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, rolling-----	1,277	0.3
233D	Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, hilly-----	1,263	0.3

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
233E	Alfic Haplorthods-Entic Haplorthods, fine-loamy banded substratum, complex, sandy, steep	426	0.1
234B	Lamellic Oxyaquic Haplorthods, sandy, nearly level and undulating-----	192	*
235B	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, nearly level and undulating-----	904	0.2
235C	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, rolling-----	669	0.2
235D	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, hilly-----	992	0.3
235E	Alfic Haplorthods, sandy over loamy-Alfic Haplorthods, sandy, complex, steep-----	248	*
236B	Arenic Hapludalfs, nearly level and undulating-----	540	0.1
236C	Arenic Hapludalfs, rolling-----	689	0.2
236D	Arenic Hapludalfs, hilly-----	853	0.2
236E	Arenic Hapludalfs, steep-----	104	*
237B	Glossudalfs, loamy, nearly level and undulating-----	1,192	0.3
237C	Glossudalfs, loamy, rolling-----	2,026	0.6
237D	Glossudalfs, loamy, hilly-----	1,444	0.4
237E	Glossudalfs, loamy, steep-----	235	*
247B	Glennie-Ossineke complex, nearly level and undulating-----	140	*
247C	Glennie-Ossineke complex, rolling-----	720	0.2
250D	Glossudalfs-Haplosaprists, euic, complex, nearly level to hilly-----	643	0.2
252A	Haplosaprists, euic-Au Gres complex, nearly level-----	219	*
254A	Haplosaprists, euic-Fluvaquents-Aquic Udipsammets complex, nearly level, occasionally flooded-----	228	*
262A	Au Gres sand, nearly level-----	2,477	0.7
264A	Allendale loamy sand, nearly level-----	26	*
265B	Glossudalfs-Allendale complex, nearly level and undulating-----	201	*
272	Endoaquods-Fluvaquents, occasionally flooded, complex-----	1,535	0.4
273	Leafriver-Wakeley complex-----	671	0.2
274	Typic Endoaquods, wet-----	48	*
280	Aquents and Histosols, ponded-----	809	0.2
281	Haplosaprists, dysic-----	406	0.1
282	Haplosaprists, euic-----	4,221	1.2
307B	Klacking sand, 0 to 6 percent slopes-----	2,951	0.8
307E	Klacking sand, 18 to 35 percent slopes-----	86	*
338B	Islandlake sand, 0 to 6 percent slopes-----	1,655	0.5
338E	Islandlake sand, 18 to 35 percent slopes-----	273	*
352B	Deford-Au Gres-Croswell complex, 0 to 6 percent slopes-----	7,434	2.0
360	Wakeley muck-----	1,407	0.4
362B	Millersburg loamy sand, 0 to 6 percent slopes-----	965	0.3
362D	Millersburg loamy sand, 6 to 18 percent slopes-----	924	0.3
362E	Millersburg loamy sand, 18 to 35 percent slopes-----	95	*
368A	Au Gres-Deford complex, 0 to 3 percent slopes-----	2,125	0.6
369	Deford muck-----	777	0.2
371	Springport silt loam-----	444	0.1
380	Access denied-----	2,926	0.8
384B	Iosco sand, 0 to 6 percent slopes-----	39	*
388B	Millersburg-Klacking-Graycalm complex, 0 to 6 percent slopes-----	5,005	1.4
388D	Millersburg-Klacking-Graycalm complex, 6 to 18 percent slopes-----	4,537	1.2
388E	Millersburg-Klacking-Graycalm complex, 18 to 35 percent slopes-----	772	0.2
390B	Horsehead-Graycalm sands, 0 to 6 percent slopes-----	2,727	0.7
390D	Horsehead-Graycalm sands, 6 to 18 percent slopes-----	1,300	0.4
390E	Horsehead-Graycalm sands, 18 to 35 percent slopes-----	686	0.2
390F	Horsehead-Graycalm sands, 35 to 70 percent slopes-----	285	*
391B	Horsehead sand, 0 to 6 percent slopes-----	15	*
393B	Morganlake loamy sand, 0 to 6 percent slopes-----	1,165	0.3
393C	Morganlake loamy sand, 6 to 12 percent slopes-----	290	*
399D	Menominee-Bamfield, sandy substratum-Blue Lake complex, 12 to 18 percent slopes-----	195	*
400F	Menominee-Bamfield, sandy substratum-Blue Lake complex, 18 to 70 percent slopes, dissected-----	128	*
424B	Morganlake-Ossineke, sandy substratum-Blue Lake complex, 0 to 6 percent slopes-----	692	0.2
424C	Morganlake-Ossineke, sandy substratum-Blue Lake complex, 6 to 12 percent slopes-----	829	0.2
426B	Coppler loamy sand, 0 to 6 percent slopes-----	11	*
441B	Morganlake-Nester complex, 0 to 6 percent slopes-----	885	0.2
441C	Morganlake-Nester complex, 6 to 12 percent slopes-----	363	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
452D	Bamfield fine sandy loam, sandy substratum, 12 to 18 percent slopes-----	227	*
475B	Graycalm-Klacking sands, 0 to 6 percent slopes-----	11,880	3.2
475D	Graycalm-Klacking sands, 6 to 18 percent slopes-----	12,624	3.5
475E	Graycalm-Klacking sands, 18 to 35 percent slopes-----	1,640	0.4
476B	Klacking-Perecheney sands, 0 to 6 percent slopes-----	2,625	0.7
476D	Klacking-Perecheney sands, 6 to 18 percent slopes-----	378	0.1
488A	Allendale sand, 0 to 3 percent slopes-----	1,025	0.3
496B	Gerrish-Grayling sands, 0 to 6 percent slopes-----	1,734	0.5
503D	Bamfield, sandy substratum-Millersburg-Horsehead complex, 6 to 18 percent slopes-----	1,732	0.5
503E	Bamfield, sandy substratum-Millersburg-Horsehead complex, 18 to 35 percent slopes-----	512	0.1
504B	Coppler-Horsehead sands, 0 to 6 percent slopes-----	2,015	0.6
504D	Coppler-Horsehead sands, 6 to 18 percent slopes-----	463	0.1
504E	Coppler-Horsehead sands, 18 to 35 percent slopes-----	132	*
505B	Ossineke-Millersburg-Horsehead complex, 0 to 6 percent slopes-----	764	0.2
505C	Ossineke-Millersburg-Horsehead complex, 6 to 12 percent slopes-----	462	0.1
506B	Durkeelake sand, 0 to 6 percent slopes-----	609	0.2
506C	Durkeelake sand, 6 to 12 percent slopes-----	243	*
507D	Islandlake sand, 6 to 18 percent slopes-----	1,148	0.3
508B	Islandlake-Blue Lake sands, 0 to 6 percent slopes-----	811	0.2
508D	Islandlake-Blue Lake sands, 6 to 18 percent slopes-----	1,035	0.3
508E	Islandlake-Blue Lake sands, 18 to 35 percent slopes-----	166	*
509A	Colonville-Thunderbay complex, 0 to 3 percent slopes, occasionally flooded-----	146	*
510	Deerheart silt loam-----	185	*
511B	Parmalee fine sandy loam, 0 to 6 percent slopes-----	234	*
511C	Parmalee fine sandy loam, 6 to 12 percent slopes-----	66	*
512A	Algonquin-Springport silt loams, 0 to 3 percent slopes-----	2,851	0.8
513A	Bowers loam, 0 to 3 percent slopes-----	102	*
W	Water-----	4,398	1.2
	Total-----	365,831	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields Per Acre of Crops and Pasture

(Only the soils that are commonly used for crops and pasture are listed. Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Barley	Corn	Corn silage	Oats	Rye	Sun-flowers	Winter wheat	Alfalfa hay	Grass-legume hay	Improved permanent pasture	Unimproved permanent pasture
		Bu	Bu	Tons	Bu	Bu	Lbs	Bu	Tons	Tons	AUM*	AUM*
16B----- Graycalm	4s	---	---	---	---	---	---	---	2.5	2.0	0.5	0.2
17B----- Crowwell	4s	---	65.0	12.0	---	---	---	---	3.0	2.8	0.5	0.2
20B----- Graycalm----- Grayling-----	4s 6s	---	---	---	---	---	---	---	2.5	2.0	0.5	0.2
20D----- Graycalm----- Grayling-----	6s 7s	---	---	---	---	---	---	---	2.5	2.5	0.5	0.2
32B----- Kellogg	3s	60.0	70.0	12.0	60.0	---	---	40.0	3.5	3.0	1.2	0.8
32C----- Kellogg	3s	60.0	70.0	12.0	60.0	---	---	40.0	3.5	3.0	1.2	0.8
44B----- Ossineke	3e	60.0	80.0	13.0	60.0	---	---	40.0	4.0	3.5	1.0	0.5
44C----- Ossineke	3e	60.0	80.0	13.0	60.0	---	---	40.0	4.0	3.5	1.0	0.5
47D----- Graycalm	6s	---	---	---	---	---	---	---	2.5	2.0	0.5	0.2
53B----- Negwegon	3e	60.0	90.0	15.0	60.0	---	---	45.0	4.0	3.5	1.2	0.8
53C----- Negwegon	3e	60.0	90.0	15.0	60.0	---	---	45.0	4.0	3.5	1.2	0.8
54A----- Algonquin	3w	60.0	90.0	14.0	60.0	---	---	45.0	4.0	3.5	1.2	0.8

See footnote at end of table.

Table 5.--Land Capability and Yields Per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capa- bility	Barley	Corn	Corn silage	Oats	Rye	Sun- flowers	Winter wheat	Alfalfa hay	Grass-legume hay	Improved permanent pasture	Unimproved permanent pasture
		Bu	Bu	Tons	Bu	Bu	Lbs	Bu	Tons	Tons	AUM*	AUM*
56B----- Nester	2e	---	---	---	---	---	---	---	3.5	3.0	1.0	0.5
56C----- Nester	3e	---	---	---	---	---	---	---	3.5	3.0	1.0	0.5
58A----- Wakeley----- Allendale-----	5w 3w	---	---	---	---	---	---	---	---	---	1.2	0.8
90B----- Chinwhisker	4s	---	65.0	12.0	---	---	---	---	3.0	2.8	0.5	0.2
96D2----- Mongo	4e	---	---	---	---	---	---	---	2.8	---	---	---
110D----- Mongo	4e	50.0	---	---	50.0	---	---	---	3.5	3.0	1.2	0.8
307B----- Klacking	3s	---	---	---	---	---	---	---	3.5	3.0	1.0	0.5
338B----- Islandlake	4s	40.0	65.0	12.0	---	---	---	---	2.5	2.0	0.5	0.2
360----- Wakeley	5w	---	---	---	---	---	---	---	---	---	1.0	0.5
362B----- Millersburg	3s	50.0	---	12.0	50.0	---	---	---	3.0	2.5	1.0	0.5
362D----- Millersburg	4e	40.0	---	10.0	40.0	---	---	---	2.5	2.0	1.0	0.5
371----- Springport	5w	---	---	---	---	---	---	---	---	---	0.5	0.2
393B----- Morganlake	3s	60.0	---	---	60.0	---	---	---	3.5	3.0	1.0	0.5
393C----- Morganlake	3e	60.0	---	---	60.0	---	---	---	3.5	3.0	1.0	0.5

See footnote at end of table.

Table 5.--Land Capability and Yields Per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capa- bility	Barley	Corn	Corn silage	Oats	Rye	Sun- flowers	Winter wheat	Alfalfa hay	Grass-legume hay	Improved permanent pasture	Unimproved permanent pasture
		Bu	Bu	Tons	Bu	Bu	Lbs	Bu	Tons	Tons	AUM*	AUM*
424B----- Morganlake---- Ossineke, sandy substratum--- Blue Lake-----	3s 3e 3s	60.0	---	---	60.0	---	---	---	3.7	3.2	1.0	0.5
424C----- Morganlake---- Ossineke, sandy substratum--- Blue Lake-----	3e 3e 3s	60.0	---	---	60.0	---	---	---	3.7	3.2	1.0	0.5
441B----- Morganlake---- Nester-----	3s 2e	60.0	75.0	12.0	60.0	---	---	---	3.5	3.0	1.0	0.5
475B----- Graycalm----- Klacking-----	4s 3s	40.0	70.0	11.0	40.0	30.0	14.0	---	3.5	3.0	1.0	0.5
475D----- Graycalm----- Klacking-----	6s 4e	35.0	60.0	10.0	35.0	30.0	---	---	3.5	3.0	1.0	0.5
476B----- Klacking----- Perecheney----	3s 4s	45.0	75.0	12.0	40.0	---	---	---	3.5	3.0	1.0	0.5
488A----- Allendale	3w	50.0	85.0	14.0	60.0	---	---	40.0	4.0	3.5	1.2	0.8
504B----- Coppler----- Horsehead-----	3s 6s	25.0	65.0	10.0	40.0	25.0	12.0	---	3.0	2.5	0.7	0.4
504D----- Coppler----- Horsehead-----	4e 7s	25.0	60.0	9.0	35.0	25.0	12.0	---	3.0	2.5	0.7	0.4

See footnote at end of table.

Table 5.--Land Capability and Yields Per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capa- bility	Barley	Corn	Corn silage	Oats	Rye	Sun- flowers	Winter wheat	Alfalfa hay	Grass-legume hay	Improved permanent pasture	Unimproved permanent pasture
		Bu	Bu	Tons	Bu	Bu	Lbs	Bu	Tons	Tons	AUM*	AUM*
507D----- Islandlake	6s	35.0	55.0	10.0	---	---	---	---	2.5	2.5	0.5	0.2
508B----- Islandlake---- Blue Lake-----	4s 3s	---	50.0	9.0	---	30.0	14.0	---	3.5	3.0	1.0	0.5
512A----- Algonquin----- Springport----	3w 5w	60.0	90.0	15.0	60.0	---	---	45.0	4.0	3.5	1.2	0.8
513A----- Bowers	2w	60.0	90.0	15.0	60.0	---	---	45.0	4.0	3.5	1.2	0.8

* Animal unit month: The amount of forage or feed needed to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
36B	Annalake loamy very fine sand, 0 to 6 percent slopes
37A	Richter loamy fine sand, 0 to 3 percent slopes (where drained)
44B	Ossineke fine sandy loam, 0 to 6 percent slopes
53B	Negwegon silt loam, 2 to 6 percent slopes
54A	Algonquin silt loam, 0 to 3 percent slopes (where drained)
56B	Nester loam, 0 to 6 percent slopes
57B	Kawkawlin loam, 1 to 4 percent slopes (where drained)
67A	Bowers-Deerheart complex, 0 to 3 percent slopes (where drained)
371	Springport silt loam (where drained)
384B	Iosco sand, 0 to 6 percent slopes (where drained)
510	Deerheart silt loam (where drained)
511B	Parmalee fine sandy loam, 0 to 6 percent slopes
512A	Algonquin-Springport silt loams, 0 to 3 percent slopes (where drained)
513A	Bowers loam, 0 to 3 percent slopes (where drained)

Table 7.--Forestland Management and Productivity

(Only the soils suitable for production of commercial trees 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	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
13: Tawas-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Northern whitecedar Tamarack----- Black spruce----- Balsam fir----- American elm----- Paper birch----- Red maple-----	--- --- 20 40 --- --- ---	--- --- 29 71 --- --- ---	---
Lupton-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Northern whitecedar Tamarack----- Black spruce----- Balsam fir----- American elm----- Paper birch----- Red maple-----	--- --- 20 40 --- --- ---	--- --- 29 71 --- --- ---	---
14: Dawson-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack----- Eastern white pine-- Jack pine----- Red pine-----	15 --- --- --- ---	23 --- --- --- ---	---
Loxley-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black spruce----- Tamarack----- Eastern white pine-- Jack pine----- Red pine-----	15 --- --- --- ---	23 --- --- --- ---	---
15A: Croswell-----	Slight-----	Well suited	Slight----- Wetness	Low-----	Red pine----- Northern red oak--- Quaking aspen----- Jack pine----- Eastern white pine-- Red maple----- Balsam fir-----	55 --- 68 53 --- --- ---	88 --- 78 73 --- --- ---	Eastern white pine, red pine, white spruce.
Au Gres-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple----- Eastern white pine-- Paper birch----- Jack pine----- Red pine-----	70 --- 65 --- --- 51 ---	81 --- 40 --- --- 69 ---	Norway spruce, eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
16B: Graycalm-----	Slight-----	Well suited	Slight-----	Low-----	Bigtooth aspen----- Northern red oak---- Red maple----- Red pine----- Paper birch----- White oak----- Eastern white pine-- Jack pine----- Quaking aspen-----	70 62 --- --- --- --- --- --- 60	81 54 --- --- --- --- --- --- 64	Eastern white pine, red pine.
17B: Croswell-----	Slight-----	Well suited	Slight-----	Low-----	Red pine----- Northern red oak---- Quaking aspen----- Jack pine----- Eastern white pine-- Red maple----- Balsam fir-----	55 --- 68 53 --- --- ---	88 --- 78 73 --- --- ---	Eastern white pine, red pine, white spruce.
18A: Au Gres-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple----- Eastern white pine-- Paper birch----- Jack pine----- Red pine-----	70 --- 65 --- --- 51 61	81 --- 40 --- --- 69 104	Eastern white pine, jack pine, red pine.
19: Leafriver-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Northern whitecedar Paper birch----- Black ash----- Balsam fir----- Balsam poplar----- Red maple----- Eastern white pine--	--- --- --- --- 45 --- ---	--- --- --- --- 29 --- ---	---
20B: Graycalm-----	Slight-----	Well suited	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
20B: Grayling-----	Slight-----	Well suited	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Jack pine, red pine.
20D: Graycalm-----	Moderate: Slope	Well suited	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Eastern white pine, red pine.
Grayling-----	Moderate: Slope	Well suited	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Jack pine, red pine.
20F: Graycalm-----	Severe: Slope	Poorly suited: Slope	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Jack pine, red pine.
Grayling-----	Severe: Slope	Poorly suited: Slope	Slight-----	Low-----	Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine-- Paper birch----- Black cherry-----	--- 56 70 --- --- 62 --- --- ---	--- 78 81 --- --- 54 --- --- ---	Jack pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
23: Ausable-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Tamarack----- Balsam poplar----- Quaking aspen----- Jack pine----- Northern whitecedar Paper birch-----	--- --- --- --- 15 ---	--- --- --- --- 25 ---	---
Bowstring-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Tamarack----- Balsam poplar----- Quaking aspen----- Jack pine----- Northern whitecedar Paper birch-----	--- --- --- --- 15 ---	--- --- --- --- 25 ---	---
24A: Kinross-----	Slight-----	Well suited	Severe: Wetness	High: Wetness	Black spruce----- Balsam fir----- Quaking aspen----- Red maple-----	15 --- --- ---	23 --- --- ---	Quaking aspen.
Au Gres-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple----- Eastern white pine-- Paper birch----- Jack pine----- Red pine-----	70 --- 65 --- --- 51 61	81 --- 40 --- --- 69 104	Eastern white pine, jack pine, red pine.
32B: Kellogg-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- Northern red oak---- Paper birch----- American basswood-- White ash----- Black cherry----- Eastern hophornbeam- Eastern hemlock----	67 56 --- --- --- 74 --- ---	41 44 --- --- --- 46 --- ---	Eastern white pine, red pine.
32C: Kellogg-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- Northern red oak---- Paper birch----- American basswood-- White ash----- Black cherry----- Eastern hophornbeam- Eastern hemlock----	67 56 --- --- --- 74 --- ---	41 44 --- --- --- 46 --- ---	Eastern white pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
44B: Ossineke-----	Slight-----	Well suited	Moderate: Wetness Rooting depth	Low-----	Sugar maple----- Northern red oak---- American basswood--- Paper birch----- American beech----- White ash----- Eastern hemlock-----	63 65 --- --- --- --- ---	39 59 --- --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
44C: Ossineke-----	Slight-----	Well suited	Moderate: Wetness Rooting depth	Low-----	Sugar maple----- Northern red oak---- American basswood--- Paper birch----- American beech----- White ash----- Eastern hemlock-----	63 65 --- --- --- --- ---	39 59 --- --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
47D: Graycalm-----	Moderate: Slope	Well suited	Slight-----	Low-----	Bigtooth aspen----- Northern red oak---- Red maple----- Red pine----- Paper birch----- White oak----- Eastern white pine-- Jack pine----- Quaking aspen-----	70 62 --- 61 --- --- --- 56 60	81 54 --- 104 --- --- --- 78 64	Eastern white pine, red pine.
47F: Graycalm-----	Severe: Slope	Poorly suited: Slope	Slight-----	Low-----	Bigtooth aspen----- Northern red oak---- Red maple----- Red pine----- Paper birch----- White oak----- Eastern white pine-- Jack pine----- Quaking aspen-----	70 62 --- 61 --- --- --- 56 60	81 54 --- 104 --- --- --- 78 64	Eastern white pine, red pine.
51: Tawas-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Northern whitecedar Black spruce----- Black ash----- Tamarack----- Balsam fir----- Balsam poplar----- Paper birch-----	--- --- --- --- 40 --- ---	--- --- --- --- 71 --- ---	---
Leafriver-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Northern whitecedar Black spruce----- Black ash----- Tamarack----- Balsam fir----- Balsam poplar----- Paper birch-----	--- --- --- --- 40 --- ---	--- --- --- --- 71 --- ---	---

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
54A: Algonquin-----	Slight-----	Poorly suited: Stickiness	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Paper birch----- White spruce----- Red pine----- Red maple-----	--- 45 --- --- --- ---	--- 83 --- --- --- ---	Eastern white pine, northern whitecedar, white spruce.
58A: Wakeley-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Quaking aspen----- Balsam poplar----- Northern whitecedar Balsam fir----- Black ash----- Paper birch----- Eastern white pine-- Red maple-----	50 --- --- --- --- --- --- ---	43 --- --- --- --- --- --- ---	Northern whitecedar.
Allendale-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Red maple----- Quaking aspen----- Northern red oak---- White ash----- Paper birch----- American basswood-- Eastern white pine-- American beech----- Eastern hophornbeam- White oak----- Balsam fir-----	--- 60 --- --- --- --- --- --- --- --- ---	--- 64 --- --- --- --- --- --- --- --- ---	Eastern white pine, northern red oak.
81B: Grayling-----	Slight-----	Well suited	Slight-----	Low-----	Jack pine----- Northern red oak---- Eastern white pine-- Red pine----- Black oak-----	48 --- --- --- ---	63 --- --- --- ---	Jack pine, red pine.
81D: Grayling-----	Moderate: Slope	Well suited	Slight-----	Low-----	Jack pine----- Northern red oak---- Eastern white pine-- Red pine----- Black oak-----	48 --- --- --- ---	63 --- --- --- ---	Jack pine, red pine.
81E: Grayling-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Jack pine----- Northern red oak---- Eastern white pine-- Red pine----- Black oak-----	48 --- --- --- ---	63 --- --- --- ---	Jack pine, quaking aspen, red pine.
81F: Grayling-----	Severe: Slope	Poorly suited: Slope	Slight-----	Low-----	Jack pine----- Northern red oak---- Eastern white pine-- Red pine----- Black oak-----	48 --- --- --- ---	63 --- --- --- ---	Jack pine, quaking aspen, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
87: Ausable-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Tamarack----- Balsam poplar----- Quaking aspen----- Jack pine----- Northern whitecedar Paper birch-----	--- --- --- --- 15 ---	--- --- --- --- 25 ---	---
90B: Chinwhisker---	Slight-----	Well suited	Slight-----	Low-----	Red pine----- Quaking aspen----- Eastern white pine-- Jack pine----- Black cherry----- Balsam fir-----	--- --- --- 56 --- ---	--- --- --- 78 --- ---	Eastern white pine, jack pine, white spruce.
110D: Mongo-----	Moderate: Slope	Poorly suited: Slope Stickiness	Slight-----	Low-----	Quaking aspen----- Balsam fir----- Eastern white pine-- Sugar maple----- Paper birch----- Northern whitecedar	--- --- --- 62 --- ---	--- --- --- 39 --- ---	Eastern white pine, white spruce.
110F: Mongo-----	Moderate: Slope	Poorly suited: Slope Stickiness	Slight-----	Low-----	Quaking aspen----- Balsam fir----- Eastern white pine-- Sugar maple----- Paper birch----- Northern whitecedar	--- --- --- 62 --- ---	--- --- --- 39 --- ---	Eastern white pine, white spruce.
123D: Klacking-----	Moderate: Slope	Well suited	Slight-----	Low-----	Northern red oak---- Red maple----- Paper birch----- Red pine----- Jack pine----- Quaking aspen----- Bigtooth aspen----- Eastern white pine-- Northern pin oak----	60 --- --- --- --- --- 70 --- ---	51 --- --- --- --- --- 81 --- ---	Eastern white pine, red pine.
144B: Perecheney----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen----- Red maple----- Red pine----- Northern red oak---- Black oak----- Black cherry----- White oak-----	70 --- --- --- --- --- ---	81 --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
144C: Perechenev----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen----- Red maple----- Red pine----- Northern red oak---- Black oak----- Black cherry----- White oak-----	70 --- --- --- --- --- ---	81 --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
307B: Klacking-----	Slight-----	Well suited	Slight-----	Low-----	Northern red oak---- Red maple----- Paper birch----- Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Eastern white pine-- Northern pin oak----	60 --- --- --- --- 70 --- --- --- ---	51 --- --- --- --- 81 --- --- --- ---	Eastern white pine, red pine.
307E: Klacking-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Northern red oak---- Red maple----- Paper birch----- Red pine----- Jack pine----- Bigtooth aspen----- Quaking aspen----- Eastern white pine-- Northern pin oak----	60 --- --- --- --- 70 --- --- --- ---	51 --- --- --- --- 81 --- --- --- ---	Eastern white pine, red pine.
338B: Islandlake----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American beech----- American basswood--- White ash----- Paper birch----- Northern red oak---- Eastern hophornbeam- Black cherry-----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
338E: Islandlake----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- American beech----- American basswood--- White ash----- Paper birch----- Northern red oak---- Eastern hophornbeam- Black cherry-----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
352B: Deford-----	Slight-----	Well suited	Severe: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple-----	60 --- 64	64 --- 40	Eastern white pine, white spruce.
Au Gres-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple----- Eastern white pine-- Paper birch----- Jack pine----- Red pine-----	70 --- 65 --- --- 51 61	81 --- 40 --- --- 69 104	Norway spruce, eastern white pine, red pine, white spruce.
Croswell-----	Slight-----	Well suited	Slight-----	Low-----	Red pine----- Northern red oak---- Quaking aspen----- Jack pine----- Eastern white pine-- Red maple----- Balsam fir-----	55 --- 68 53 --- --- ---	88 --- 78 73 --- --- ---	Eastern white pine, red pine, white spruce.
360: Wakeley-----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Quaking aspen----- Balsam poplar----- Northern whitecedar Balsam fir----- Black ash----- Paper birch----- Eastern white pine-- Red maple-----	50 --- --- --- --- --- --- ---	43 --- --- --- --- --- --- ---	Northern whitecedar.
362B: Millersburg---	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Bigtooth aspen----- Quaking aspen----- Northern red oak---- Eastern white pine-- Red maple----- Paper birch----- Eastern hophornbeam-	65 --- --- --- --- --- --- --- --- --- ---	40 --- --- --- --- --- --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.
362D: Millersburg---	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Bigtooth aspen----- Quaking aspen----- Northern red oak---- Eastern white pine-- Red maple----- Paper birch----- Eastern hophornbeam-	65 --- --- --- --- --- --- --- --- --- ---	40 --- --- --- --- --- --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
362E: Millersburg---	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Bigtooth aspen----- Quaking aspen----- Northern red oak---- Eastern white pine-- Red maple----- Paper birch----- Eastern hophornbeam-	65 --- --- --- --- --- --- --- --- ---	40 --- --- --- --- --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.
368A: Au Gres-----	Slight----	Well suited	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple----- Eastern white pine-- Paper birch----- Jack pine----- Red pine-----	70 --- 65 --- --- 51 61	81 --- 40 --- --- 69 104	Norway spruce, eastern white pine, red pine, white spruce.
Deford-----	Slight----	Well suited	Severe: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple-----	60 --- 64	64 --- 40	Eastern white pine, white spruce.
369: Deford-----	Slight----	Well suited	Severe: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Red maple-----	60 --- 64	64 --- 40	Eastern white pine, white spruce.
371: Springport---	Slight----	Poorly suited: Stickiness	Severe: Wetness	High: Wetness	Quaking aspen----- Northern whitecedar Black ash----- Red maple----- Balsam fir----- American basswood--- Eastern white pine-- Balsam poplar----- Paper birch-----	--- --- --- --- 45 --- --- --- ---	--- --- --- --- 83 --- --- --- ---	Eastern white pine, northern whitecedar, white spruce.
388B: Millersburg---	Slight----	Well suited	Slight----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	--- --- --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
388B: Klacking-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Eastern white pine, red pine.
Graycalm-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Eastern white pine, red pine.
388D: Millersburg---	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Norway spruce, jack pine, red pine, white spruce.
Klacking-----	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Eastern white pine, red pine.
Graycalm-----	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Eastern white pine, red pine.
388E: Millersburg---	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	---	Norway spruce, jack pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
388E: Klackling-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	--- --- --- --- --- --- ---	Eastern white pine, red pine.
Graycalm-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- White oak----- Northern red oak---- Eastern white pine-- Quaking aspen----- Red maple----- Bigtooth aspen-----	--- --- --- --- --- --- ---	--- --- --- --- --- --- ---	Eastern white pine, red pine.
390B: Horsehead-----	Slight-----	Well suited	Slight-----	Low-----	Northern red oak---- Black oak----- White oak----- Eastern white pine-- Bigtooth aspen----- Quaking aspen----- Paper birch----- Black cherry----- Red maple----- White ash-----	54 --- --- --- 48 48 --- --- 53 ---	40 --- --- --- 39 39 --- --- 34 ---	Jack pine, red pine.
Graycalm-----	Slight-----	Well suited	Slight-----	Low-----	Northern red oak---- Black oak----- White oak----- Eastern white pine-- Bigtooth aspen----- Quaking aspen----- Paper birch----- Black cherry----- Red maple----- White ash-----	54 --- --- --- 48 48 --- --- 53 ---	40 --- --- --- 39 39 --- --- 34 ---	Eastern white pine, red pine.
390D: Horsehead-----	Moderate: Slope	Well suited	Slight-----	Low-----	Northern red oak---- Black oak----- White oak----- Eastern white pine-- Bigtooth aspen----- Quaking aspen----- Paper birch----- Black cherry----- Red maple----- White ash-----	54 --- --- --- 48 48 --- --- 53 ---	40 --- --- --- 39 39 --- --- 34 ---	Jack pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
390D: Graycalm-----	Moderate: Slope	Well suited	Slight-----	Low-----	Northern red oak----	54	40	Eastern white pine, red pine.
					Black oak-----	---	---	
					White oak-----	---	---	
					Eastern white pine--	---	---	
					Bigtooth aspen-----	48	39	
					Quaking aspen-----	48	39	
					Paper birch-----	---	---	
					Black cherry-----	---	---	
					Red maple-----	53	34	
					White ash-----	---	---	
390E: Horsehead-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Northern red oak----	54	40	Jack pine, red pine.
					Black oak-----	---	---	
					White oak-----	---	---	
					Eastern white pine--	---	---	
					Bigtooth aspen-----	48	39	
					Quaking aspen-----	48	39	
					Paper birch-----	---	---	
					Black cherry-----	---	---	
					Red maple-----	53	34	
					White ash-----	---	---	
Graycalm-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Northern red oak----	54	40	Eastern white pine, red pine.
					Black oak-----	---	---	
					White oak-----	---	---	
					Eastern white pine--	---	---	
					Bigtooth aspen-----	48	39	
					Quaking aspen-----	48	39	
					Paper birch-----	---	---	
					Black cherry-----	---	---	
					Red maple-----	53	34	
					White ash-----	---	---	
390F: Horsehead-----	Very severe Slope	Unsuited: Slope	Slight-----	Low-----	Northern red oak----	54	40	Jack pine, red pine.
					Black oak-----	---	---	
					White oak-----	---	---	
					Eastern white pine--	---	---	
					Bigtooth aspen-----	48	39	
					Quaking aspen-----	48	39	
					Paper birch-----	---	---	
					Black cherry-----	---	---	
					Red maple-----	53	34	
					White ash-----	---	---	
Graycalm-----	Very severe Slope	Unsuited: Slope	Slight-----	Low-----	Northern red oak----	54	40	Eastern white pine, red pine.
					Black oak-----	---	---	
					White oak-----	---	---	
					Eastern white pine--	---	---	
					Bigtooth aspen-----	48	39	
					Quaking aspen-----	48	39	
					Paper birch-----	---	---	
					Black cherry-----	---	---	
					Red maple-----	53	34	
					White ash-----	---	---	

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
393B: Morganlake----	Slight----	Well suited	Slight----	Low-----	Sugar maple-----	---	---	Eastern white pine, red pine, white spruce.
					Red pine-----	62	107	
					American basswood---	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	76	89	
					White ash-----	---	---	
					Red maple-----	---	---	
					Northern red oak----	63	56	
					Eastern white pine--	---	---	
					Yellow birch-----	---	---	
					Quaking aspen-----	74	86	
					Jack pine-----	---	---	
					Paper birch-----	---	---	
					Eastern hophornbeam-	---	---	
					Black cherry-----	---	---	
393C: Morganlake----	Slight----	Well suited	Slight----	Low-----	Sugar maple-----	---	---	Eastern white pine, red pine, white spruce.
					Red pine-----	62	107	
					American basswood---	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	76	89	
					White ash-----	---	---	
					Red maple-----	---	---	
					Northern red oak----	63	56	
					Eastern white pine--	---	---	
					Yellow birch-----	---	---	
					Quaking aspen-----	74	86	
					Jack pine-----	---	---	
					Paper birch-----	---	---	
					Eastern hophornbeam-	---	---	
					Black cherry-----	---	---	
399D: Menominee-----	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple-----	---	---	Eastern white pine, white spruce.
					White ash-----	77	76	
					American beech-----	---	---	
					Quaking aspen-----	74	86	
					Paper birch-----	---	---	
					Eastern hophornbeam-	---	---	
Bamfield, sandy substratum---	Moderate: Slope	Poorly suited: Slope	Moderate: Rooting depth	Low-----	Sugar maple-----	---	---	American basswood, Norway spruce, eastern white pine, sugar maple, white ash, white spruce.
					White ash-----	77	76	
					American beech-----	---	---	
					Quaking aspen-----	74	86	
					Paper birch-----	---	---	
					Eastern hophornbeam-	---	---	
					American basswood---	---	---	
					Northern red oak----	---	---	

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
399D: Blue Lake-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- White ash----- American beech----- Quaking aspen----- Paper birch----- Eastern hophornbeam----- American basswood----- Northern red oak----	--- 77 --- 74 --- --- --- ---	--- 76 --- 86 --- --- --- ---	Eastern white pine, jack pine, northern red oak, red maple, red pine.
400F: Menominee-----	Severe: Slope	Unsuited: Slope	Slight-----	Low-----	Sugar maple----- White ash----- American beech----- Quaking aspen----- Paper birch----- Eastern hophornbeam----- American basswood----- Northern red oak----	--- 77 --- 74 --- --- --- ---	--- 76 --- 86 --- --- --- ---	Eastern white pine, white spruce.
Bamfield, sandy substratum---	Severe: Slope	Unsuited: Slope	Moderate: Rooting depth	Low-----	Sugar maple----- White ash----- American beech----- Quaking aspen----- Paper birch----- Eastern hophornbeam----- American basswood----- Northern red oak----	--- 77 --- 74 --- --- --- ---	--- 76 --- 86 --- --- --- ---	American basswood, Norway spruce, eastern white pine, sugar maple, white ash, white spruce.
Blue Lake-----	Severe: Slope	Unsuited: Slope	Slight-----	Low-----	Sugar maple----- White ash----- American beech----- Quaking aspen----- Paper birch----- Eastern hophornbeam----- American basswood----- Northern red oak----	--- 77 --- 74 --- --- --- ---	--- 76 --- 86 --- --- --- ---	Eastern white pine, jack pine, northern red oak, red maple, red pine.
424B: Morganlake-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American basswood----- White ash----- Northern red oak---- American beech----- Eastern hophornbeam----- Black cherry----- Eastern hemlock-----	--- --- --- 63 --- --- --- ---	--- --- --- 56 --- --- --- ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
424B: Ossineke, sandy substratum---	Slight-----	Well suited	Moderate: Wetness	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Eastern hophornbeam- Black cherry----- Eastern hemlock-----	--- --- 63 --- --- --- ---	--- --- 56 --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
Blue Lake-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Eastern hophornbeam- Black cherry----- Eastern hemlock-----	--- --- --- 63 --- --- ---	--- --- 56 --- --- ---	Eastern white pine, jack pine, red pine.
424C: Morganlake-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Eastern hophornbeam- Black cherry----- Eastern hemlock-----	--- --- --- 63 --- --- ---	--- --- 56 --- --- ---	Eastern white pine, red pine, white spruce.
Ossineke, sandy substratum---	Slight-----	Well suited	Moderate: Wetness	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Eastern hophornbeam- Black cherry----- Eastern hemlock-----	--- --- --- 63 --- --- ---	--- --- 56 --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
Blue Lake-----	Slight-----	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Eastern hophornbeam- Black cherry----- Eastern hemlock-----	--- --- --- 63 --- --- ---	--- --- 56 --- --- ---	Eastern white pine, jack pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
475B: Graycalm-----	Slight-----	Well suited	Slight-----	Low-----	Northern red oak----	62	54	Eastern white pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
Klacking-----	Slight-----	Well suited	Slight-----	Low-----	Northern red oak----	62	54	Eastern white pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
475D: Graycalm-----	Moderate: Slope	Well suited	Slight-----	Low-----	Northern red oak----	62	54	Eastern white pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
Klacking-----	Moderate: Slope	Well suited	Slight-----	Low-----	Northern red oak----	62	54	Eastern white pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
475E: Graycalm-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Northern red oak----	62	54	Jack pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
475E: Klackung-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Northern red oak----	62	54	Eastern white pine, red pine.
					Red maple-----	---	---	
					Paper birch-----	---	---	
					Red pine-----	---	---	
					American basswood--	---	---	
					American beech-----	---	---	
					Bigtooth aspen-----	70	81	
					Eastern white pine--	---	---	
					Quaking aspen-----	---	---	
476B: Klackung-----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen-----	70	81	Eastern white pine, red pine.
					Black oak-----	---	---	
					Red pine-----	---	---	
					Eastern white pine--	---	---	
					Black cherry-----	---	---	
					Red maple-----	---	---	
					Jack pine-----	---	---	
					Northern red oak----	60	51	
Perecheney----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen-----	70	81	Eastern white pine, red pine, white spruce.
					Black oak-----	---	---	
					Red pine-----	---	---	
					Eastern white pine--	---	---	
					Black cherry-----	---	---	
					Red maple-----	---	---	
					Jack pine-----	---	---	
					Northern red oak----	60	51	
476D: Klackung-----	Moderate: Slope	Well suited	Slight-----	Low-----	Quaking aspen-----	70	81	Eastern white pine, red pine.
					Black oak-----	---	---	
					Red pine-----	---	---	
					Eastern white pine--	---	---	
					Black cherry-----	---	---	
					Red maple-----	---	---	
					Jack pine-----	---	---	
					Northern red oak----	60	51	
Perecheney----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen-----	70	81	Eastern white pine, red pine, white spruce.
					Black oak-----	---	---	
					Red pine-----	---	---	
					Eastern white pine--	---	---	
					Black cherry-----	---	---	
					Red maple-----	---	---	
					Jack pine-----	---	---	
					Northern red oak----	60	51	

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
488A: Allendale-----	Slight-----	Well suited	Moderate: Wetness	High: Wetness	Red maple----- Quaking aspen----- Northern red oak---- White ash----- Paper birch----- American basswood--- Eastern white pine-- American beech----- Eastern hophornbeam- White oak----- Balsam fir----- Red pine-----	--- 60 --- --- --- --- --- --- --- --- ---	--- 64 --- --- --- --- --- --- --- --- ---	Eastern white pine, northern red oak.
496B: Gerrish-----	Slight-----	Well suited	Slight-----	Low-----	Jack pine----- Red pine----- Northern red oak---- Bigtooth aspen----- Quaking aspen----- Paper birch----- Black oak----- Black cherry-----	--- --- --- 70 --- --- --- ---	--- --- --- 81 --- --- --- ---	Eastern white pine, jack pine, red pine.
Grayling-----	Slight-----	Well suited	Slight-----	Low-----	Jack pine----- Red pine----- Northern red oak---- Bigtooth aspen----- Quaking aspen----- Paper birch----- Black oak----- Black cherry-----	--- --- --- 70 --- --- --- ---	--- --- --- 81 --- --- --- ---	Jack pine, red pine.
503D: Bamfield, sandy substratum---	Moderate: Slope	Well suited	Moderate: Rooting depth	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
Millersburg---	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.
Horsehead-----	Moderate: Slope	Well suited	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Jack pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
503E: Bamfield, sandy substratum---	Moderate: Slope	Poorly suited: Slope	Moderate: Rooting depth	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Norway spruce, eastern white pine, red pine, white spruce.
Millersburg---	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Norway spruce, jack pine, red pine, white spruce.
Horsehead-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- American basswood--- American beech----- White ash----- Paper birch----- Northern red oak----	61 --- --- --- --- ---	38 --- --- --- --- ---	Jack pine, red pine.
504B: Coppler-----	Slight-----	Well suited	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Eastern white pine, jack pine, red pine.
Horsehead-----	Slight-----	Well suited	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Jack pine, red pine.
504D: Coppler-----	Moderate: Slope	Well suited	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Eastern white pine, jack pine, red pine.
Horsehead-----	Moderate: Slope	Well suited	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Jack pine, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
504E: Coplper-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Eastern white pine, jack pine, red pine.
Horsehead-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Bigtooth aspen----- Red pine----- Jack pine----- Quaking aspen----- Red maple----- Northern red oak---- Eastern white pine--	58 --- --- --- --- --- ---	60 --- --- --- --- --- ---	Jack pine, red pine.
506B: Durkeelake----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen----- Red maple----- Balsam fir----- Paper birch----- Sugar maple----- American basswood--- Black cherry----- Eastern white pine-- Red pine----- White spruce----- Northern red oak----	70 --- --- --- --- --- --- --- --- --- ---	81 --- --- --- --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
506C: Durkeelake----	Slight-----	Well suited	Slight-----	Low-----	Quaking aspen----- Red maple----- Balsam fir----- Paper birch----- Sugar maple----- American basswood--- Black cherry----- Eastern white pine-- Red pine----- White spruce----- Northern red oak----	70 --- --- --- --- --- --- --- --- --- ---	81 --- --- --- --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
507D: Islandlake-----	Moderate: Slope	Poorly suited: Slope	Slight-----	Low-----	Sugar maple----- American basswood--- White ash----- Northern red oak---- American beech----- Paper birch----- Yellow birch----- Eastern hophornbeam- Eastern white pine-- Black cherry-----	64 --- --- --- --- --- --- --- --- --- ---	43 --- --- --- --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
508B: Islandlake----	Slight----	Well suited	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
Blue Lake----	Slight----	Well suited	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, jack pine, red pine.
508D: Islandlake----	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
Blue Lake----	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, jack pine, northern red oak, red maple, red pine.
508E: Islandlake----	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, red pine, white spruce.
Blue Lake----	Moderate: Slope	Poorly suited: Slope	Slight----	Low-----	Sugar maple----- American beech----- American basswood--- Eastern hemlock----- White ash----- Eastern hophornbeam- Eastern white pine-- Northern red oak----	64 --- --- --- --- --- --- ---	40 --- --- --- --- --- --- ---	Eastern white pine, jack pine, northern red oak, red maple, red pine.

See footnote at end of table.

Table 7.--Forestland Management and Productivity--Continued

Map symbol and soil name	Erosion hazard	Site preparation	Windthrow hazard	Seedling mortality	Potential productivity			Suggested trees to plant
					Common trees	Site index	Volume of wood fiber*	
509A: Colonville----	Slight-----	Well suited	Moderate: Wetness	Moderate: Wetness	Black ash----- American basswood--- Balsam poplar----- Balsam fir----- Northern whitecedar Black spruce----- American hornbeam--	--- --- --- 61 45 --- ---	--- --- 120 67 --- ---	Norway spruce, eastern white pine, northern red oak, northern whitecedar, white spruce.
Thunderbay----	Slight-----	Poorly suited: Wetness	Severe: Wetness	High: Wetness	Black ash----- American basswood--- Balsam poplar----- Balsam fir----- Northern whitecedar Black spruce----- American hornbeam--	--- --- --- 61 45 --- ---	--- --- 120 67 --- ---	---
510: Deerheart----	Slight-----	Well suited	Severe: Wetness	High: Wetness	Balsam fir----- Eastern white pine-- Black ash----- Quaking aspen----- Red maple----- Eastern hophornbeam- Eastern hemlock----- Red pine-----	--- --- --- --- --- --- --- ---	--- --- --- --- --- --- --- ---	---
512A: Algonquin----	Slight-----	Poorly suited: Stickiness	Moderate: Wetness	High: Wetness	Quaking aspen----- Balsam fir----- Paper birch----- White spruce----- Red pine----- Red maple-----	--- 45 --- --- --- ---	--- 83 --- --- --- ---	Eastern white pine, northern whitecedar, white spruce.
Springport----	Slight-----	Poorly suited: Stickiness	Severe: Wetness	High: Wetness	Quaking aspen----- Northern whitecedar Black ash----- Red maple----- Balsam fir----- American basswood--- Eastern white pine-- Balsam poplar----- Paper birch-----	--- --- --- --- 45 --- --- --- ---	--- --- --- --- 83 --- --- --- ---	Eastern white pine, northern whitecedar, white spruce.

* Volume is the yield in cubic feet per acre per year at the age of culmination of the mean annual increment for fully stocked stands.

Table 8.--Equipment Limitations on Forestland

(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	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
13: Tawas-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Lupton-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
14: Dawson-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Loxley-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
15A: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
16B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
16C: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
16D: Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
17A: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
17B: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
18A: Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
19: Leafriver-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Winter	Well suited	Well suited	Well suited
20B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Grayling-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
20D: Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
Grayling-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
20F: Graycalm-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Grayling-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
21D: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Klacking-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
23: Ausable-----	Poorly suited: Wetness Flooding Sandiness	Poorly suited: Ponding Flooding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Bowstring-----	Poorly suited: Wetness Flooding	Poorly suited: Ponding Flooding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
24A: Kinross-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
26B: Cublake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
27A: Tacoda-----	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Summer, winter	Well suited	Well suited	Well suited
31B: Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
31C: Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
31D: Klacking-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
32B: Kellogg-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
32C: Kellogg-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
36B: Annalake-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
37A: Richter-----	Poorly suited: Wetness	Poorly suited: Wetness	Poorly suited: Wetness	Summer, winter	Well suited	Well suited	Well suited
41C: McGinn-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
44B: Ossineke-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
44C: Ossineke-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
47D: Graycalm-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
47F: Graycalm-----	Moderately suited: Slope	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
50B: Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Kinross-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
51: Tawas-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Leafriver-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Winter	Well suited	Well suited	Well suited
53B: Negwegon-----	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
53C: Negwegon-----	Moderately suited: Strength	Moderately suited: Strength Slope	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Slope Strength	Moderately suited: Strength
54A: Algonquin-----	Moderately suited: Strength Stickiness/ slope	Moderately suited: Strength	Moderately suited: Strength	Summer, winter	Moderately suited: Strength Stickiness/ slope	Moderately suited: Strength	Moderately suited: Strength
56B: Nester-----	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
56C: Nester-----	Moderately suited: Strength	Moderately suited: Strength Slope	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Slope Strength	Moderately suited: Strength
57B: Kawkawlin-----	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
58A: Wakeley-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Allendale-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
67A:							
Bowers-----	Moderately suited: Strength Wetness	Moderately suited: Strength Wetness	Moderately suited: Strength Wetness	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
Deerheart-----	Poorly suited: Wetness Strength	Poorly suited: Ponding Wetness Strength	Poorly suited: Wetness Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
70:							
Lupton-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
71:							
Tawas-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
75B:							
Rubicon-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
75D:							
Rubicon-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
78. Pits, borrow							
81B:							
Grayling-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
81D:							
Grayling-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
81E:							
Grayling-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
81F: Grayling-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
82B: Udorthents-----	Well suited	Well suited	Well suited	---	Well suited	Well suited	Well suited
83B: Udipsammments----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	---	Well suited	Well suited	Well suited
86: Histosols-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Aquents-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
87: Ausable-----	Poorly suited: Wetness Flooding Sandiness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
90B: Chinwhisker-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
93B: Tacoda-----	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Summer, winter	Well suited	Well suited	Well suited
Wakeley-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
94F: Klacking-----	Moderately suited: Slope	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
McGinn-----	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
96D2: Mongo-----	Moderately suited: Slope Stickiness Strength	Moderately suited: Slope Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Slope Strength Stickiness	Moderately suited: Slope Strength	Moderately suited: Strength
98C: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
110D: Mongo-----	Moderately suited: Slope Stickiness Strength	Moderately suited: Slope Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Slope Strength Stickiness	Moderately suited: Slope Strength	Moderately suited: Strength
110F: Mongo-----	Moderately suited: Slope Stickiness Strength	Poorly suited: Slope Strength	Moderately suited: Strength Slope	Summer, fall, winter	Moderately suited: Slope Strength Stickiness	Poorly suited: Slope Strength	Moderately suited: Strength Slope
111B: Kellogg-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
111C: Kellogg-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
116B: Mancelona-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
116C: Mancelona-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
116D: Mancelona-----	Moderately suited: Sandiness Slope	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
116E: Mancelona-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
123D: Klacking-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
125B: Melita-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
144B: Perecheney-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
144C: Perecheney-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
200. Borrow source							
210B: Grayling-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
210C: Grayling-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
210D: Grayling-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
210E: Grayling-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
211B: Grayling, banded substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
211B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
211C: Grayling, banded substratum-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
211D: Grayling, banded substratum-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
211E: Grayling, banded substratum-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Graycalm-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
212B: Grayling, very deep water table	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
213B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
213C: Graycalm-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
213D: Graycalm-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
214B: Oxyaquic Udipsamments----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
215B: Typic Udipsamments, loamy substratum	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
215C: Typic Udipsamments, loamy substratum	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
215D: Typic Udipsamments, loamy substratum	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
220B: Typic Udipsamments----	Moderately suited: Sandiness	Well suited	Well suited	Spring, fall, winter	Well suited	Well suited	Well suited
220C: Typic Udipsamments----	Moderately suited: Sandiness	Moderately suited: Slope	Well suited	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
220D: Typic Udipsamments----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
220E: Typic Udipsamments----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
221B: Typic Udipsamments, banded substratum-----	Moderately suited: Sandiness	Well suited	Well suited	Spring, fall, winter	Well suited	Well suited	Well suited
Lamellic Udipsamments----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
221C: Typic Udipsamments, banded substratum-----	Moderately suited: Sandiness	Moderately suited: Slope	Well suited	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Lamellic Udipsamments----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
221D: Typic Udipsamments, banded substratum-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Lamellic Udipsamments----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
221E: Typic Udipsamments, banded substratum-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Lamellic Udipsamments----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
222B: Typic Udipsamments, very deep water table-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited:	Well suited
223B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Grayling-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
223C: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Grayling-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
223D: Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
Grayling-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
223E: Graycalm-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Grayling-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
224B: Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
225B: Entic Haplorthods, sandy, loamy substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
225C: Entic Haplorthods, sandy, loamy substratum-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
225D: Entic Haplorthods, sandy, loamy substratum-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
225E: Entic Haplorthods, sandy, loamy substratum-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
230C: Entic Haplorthods, sandy-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
230D: Entic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
Alfic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
230E: Entic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Alfic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
231B: Lamellic Haplorthods, sandy-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
231C: Lamellic Haplorthods, sandy-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
231D: Lamellic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Alfic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
231E: Lamellic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Alfic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
232B: Entic Haplorthods, sandy, very deep water table-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Alfic Haplorthods, sandy, very deep water table-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
232D: Entic Haplorthods, sandy, very deep water table-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
232D: Alfic Haplorthods, sandy, very deep water table-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
233B: Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
Entic Haplorthods, sandy, fine- loamy banded substratum-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
233C: Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Entic Haplorthods, sandy, fine- loamy banded substratum-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
233D: Alfic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Entic Haplorthods, sandy, fine- loamy banded substratum-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
233E: Alfic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Entic Haplorthods, sandy, fine- loamy banded substratum-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
234B: Lamellic Oxyaquic Haplorthods, sandy-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
235B: Alfic Haplorthods, sandy over loamy	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
235C: Alfic Haplorthods, sandy over loamy	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
Alfic Haplorthods, sandy-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
235D: Alfic Haplorthods, sandy over loamy	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
235D: Alfic Haplorthods, sandy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
235E: Alfic Haplorthods, sandy over loamy	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Alfic Haplorthods, sandy-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
236B: Arenic Hapludalfs	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
236C: Arenic Hapludalfs	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
236D: Arenic Hapludalfs	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
236E: Arenic Hapludalfs	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Year round	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
237B: Glossudalfs, loamy-----	Well suited	Well suited	Well suited	---	Well suited	Well suited	Well suited
237C: Glossudalfs, loamy-----	Well suited	Moderately suited: Slope	Well suited	---	Well suited	Moderately suited: Slope	Well suited
237D: Glossudalfs, loamy-----	Moderately suited: Slope Sandiness	Poorly suited: Slope	Moderately suited: Slope	---	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
237E: Glossudalfs, loamy-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	---	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
247B: Glennie-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
Ossineke-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
247C: Glennie-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
Ossineke-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
250D: Glossudalfs-----	Moderately suited: Slope Sandiness	Moderately suited: Slope	Well suited	---	Moderately suited: Slope	Moderately suited: Slope	Well suited
Haplosaprists, euc-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
252A: Haplosaprists, euc-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
254A: Haplosaprists, euc-----	Poorly suited: Wetness Flooding	Poorly suited: Ponding Flooding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Fluvaquents-----	Poorly suited: Wetness Flooding	Poorly suited: Ponding Flooding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
254A: Aquic Udipsamments----	Poorly suited: Wetness Flooding Sandiness	Poorly suited: Wetness Flooding Sandiness	Poorly suited: Wetness Sandiness	---	Well suited	Well suited	Well suited
262A: Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
264A: Allendale-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
265B: Glossudalfs-----	Well suited	Well suited	Well suited	---	Well suited	Well suited	Well suited
Allendale-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
272: Endoaquods-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	---	Well suited	Well suited	Well suited
Fluvaquents, occasionally flooded-----	Poorly suited: Wetness Flooding	Poorly suited: Flooding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
273: Leafriver-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Winter	Well suited	Well suited	Well suited
Wakeley-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
274: Typic Endoaquods, wet-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
280: Aquents-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
Histosols-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
281: Haplosaprists, dysic-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
282: Haplosaprists, euc-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Winter	Well suited	Well suited	Well suited
307B: Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
307E: Klacking-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
338B: Islandlake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
338E: Islandlake-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
352B: Deford-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter	Well suited	Well suited	Well suited
Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Croswell-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
360: Wakeley-----	Poorly suited: Wetness Sandiness	Poorly suited: Ponding Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
362B: Millersburg-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
362D: Millersburg-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
362E: Millersburg-----	Moderately suited: Slope	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
368A: Au Gres-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
Deford-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter	Well suited	Well suited	Well suited
369: Deford-----	Poorly suited: Wetness	Poorly suited: Ponding Wetness	Poorly suited: Wetness	Summer, winter	Well suited	Well suited	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
371: Springport-----	Poorly suited: Wetness Strength	Poorly suited: Ponding Wetness Strength	Poorly suited: Wetness Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
380. Access denied							
384B: Iosco-----	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Poorly suited: Wetness Sandiness	Summer, winter	Well suited	Well suited	Well suited
388B: Millersburg-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
388D: Millersburg-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Klacking-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
388E: Millersburg-----	Moderately suited: Slope	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Klacking-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Graycalm-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
390B: Horsehead-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
390D: Horsehead-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
390E: Horsehead-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Graycalm-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
390F: Horsehead-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
Graycalm-----	Poorly suited: Slope	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
391B: Horsehead-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
393B: Morganlake-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
393C: Morganlake-----	Well suited	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
399D:							
Menominee-----	Moderately suited: Slope Sandiness Strength	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope Strength	Moderately suited: Slope	Well suited
Bamfield, sandy substratum-----	Moderately suited: Slope Strength	Moderately suited: Slope	Well suited	Summer, fall, winter	Moderately suited: Slope Strength	Moderately suited: Slope	Well suited
Blue Lake-----	Moderately suited: Sandiness Slope	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
400F:							
Menominee-----	Poorly suited: Slope Strength	Poorly suited: Slope Sandiness	Poorly suited: Slope Sandiness	Spring, fall, winter	Poorly suited: Slope Strength	Poorly suited: Slope	Poorly suited: Slope
Bamfield, sandy substratum-----	Poorly suited: Slope Strength	Poorly suited: Slope	Poorly suited: Slope	Summer, fall, winter	Poorly suited: Slope Strength	Poorly suited: Slope	Poorly suited: Slope
Blue Lake-----	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope	Spring, fall, winter	Poorly suited: Slope	Poorly suited: Slope	Poorly suited: Slope
424B:							
Morganlake-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Ossineke, sandy substratum-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
Blue Lake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
424C:							
Morganlake-----	Well suited	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Ossineke, sandy substratum-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
424C: Blue Lake-----	Moderately suited: Sandiness Slope	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
426B: Coppler-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
441B: Morganlake-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Nester-----	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
441C: Morganlake-----	Well suited	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
Nester-----	Moderately suited: Strength Slope	Moderately suited: Strength Slope	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Slope Strength	Moderately suited: Strength
452D: Bamfield, sandy substratum-----	Moderately suited: Slope Strength	Moderately suited: Slope	Well suited	Summer, fall, winter	Moderately suited: Slope Strength	Moderately suited: Slope	Well suited
475B: Graycalm-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
475D: Graycalm-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
Klacking-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
475E: Graycalm-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Klacking-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
476B: Klacking-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Perecheney-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
476D: Klacking-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Perecheney-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
488A: Allendale-----	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Poorly suited: Sandiness Wetness	Summer, winter	Well suited	Well suited	Well suited
496B: Gerrish-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Grayling-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
503D: Bamfield, sandy substratum-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
503D: Millersburg-----	Well suited	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Horsehead-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
503E: Bamfield, sandy substratum-----	Moderately suited: Slope Strength	Poorly suited: Slope	Moderately suited: Slope	Summer, fall, winter	Moderately suited: Slope Strength	Poorly suited: Slope	Moderately suited: Slope
Millersburg-----	Moderately suited: Slope	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Year round	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Horsehead-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Sandiness Slope	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
504B: Coppler-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Horsehead-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
504D: Coppler-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Horsehead-----	Moderately suited: Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
504E: Coppler-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Horsehead-----	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 Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
505B: Ossineke-----	Well suited	Well suited	Well suited	Year round	Well suited	Well suited	Well suited
Millersburg-----	Well suited	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
Horsehead-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
505C: Ossineke-----	Well suited	Moderately suited: Slope	Well suited	Year round	Well suited	Moderately suited: Slope	Well suited
Millersburg-----	Well suited	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
Horsehead-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Moderately suited: Slope	Well suited
506B: Durkeelake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Year round	Well suited	Well suited	Well suited
506C: Durkeelake-----	Moderately suited: Sandiness	Moderately suited: Sandiness Slope	Moderately suited: Sandiness	Year round	Well suited	Moderately suited: Slope	Well suited
507D: Islandlake-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
508B: Islandlake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
Blue Lake-----	Moderately suited: Sandiness	Moderately suited: Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Well suited	Well suited	Well suited
508D: Islandlake-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
508D: Blue Lake-----	Moderately suited: Slope Sandiness	Moderately suited: Slope Sandiness	Moderately suited: Sandiness	Spring, fall, winter	Moderately suited: Slope	Moderately suited: Slope	Well suited
508E: Islandlake-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
Blue Lake-----	Moderately suited: Slope Sandiness	Poorly suited: Slope Sandiness	Moderately suited: Slope Sandiness	Spring, fall, winter	Moderately suited: Slope	Poorly suited: Slope	Moderately suited: Slope
509A: Colonville-----	Poorly suited: Wetness Flooding Strength	Poorly suited: Flooding Wetness Strength	Moderately suited: Strength Wetness	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
Thunderbay-----	Poorly suited: Wetness Flooding Strength	Poorly suited: Ponding Flooding Wetness	Poorly suited: Wetness Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
510: Deerheart-----	Poorly suited: Wetness Strength	Poorly suited: Ponding Wetness Strength	Poorly suited: Wetness Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
511B: Parmalee-----	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
511C: Parmalee-----	Moderately suited: Strength	Moderately suited: Strength Slope	Moderately suited: Strength	Summer, fall, winter	Moderately suited: Strength	Moderately suited: Slope Strength	Moderately suited: Strength
512A: Algonquin-----	Moderately suited: Strength Stickiness/ slope	Moderately suited: Strength	Moderately suited: Strength	Summer, winter	Moderately suited: Strength Stickiness/ slope	Moderately suited: Strength	Moderately suited: Strength

Table 8.--Equipment Limitations on Forestland--Continued

Map symbol and soil name	Rating class and limiting features for most limiting season(s)			Preferred operating season(s)	Rating class and limiting features for preferred operating seasons(s)		
	Haul roads	Log landings	Logging areas and skid roads		Haul roads	Log landings	Logging areas and skid roads
512A: Springport-----	Poorly suited: Wetness Strength	Poorly suited: Ponding Wetness Strength	Poorly suited: Wetness Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength
513A: Bowers-----	Moderately suited: Strength Wetness	Moderately suited: Strength	Moderately suited: Strength	Summer, winter	Moderately suited: Strength	Moderately suited: Strength	Moderately suited: Strength

Table 9.--Forestland Plant Communities

(Absence of an entry indicates that information was not available)

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
13: Tawas-Lupton-----	northern whitecedar	THOC2*	aster	ASTER
	tamarack	LALA	bedstraw	GALIU
	black spruce	PIMA	wintergreen	GAPR2
	balsam fir	ABBA	sphagnum moss	SPHAG*
	American elm	ULAM	American starflower	TRBO2
	paper birch	BEPA	wild sarsaparilla	ARNU2
	red maple	ACRU	yellow blue beadlily	CLBO3
			meadow-rue	THALI2
			yellow marsh	CAPA5
			marigold	
			pyrola	PYROL
			Canada mayflower	MACA4
			sensitive fern	ONSE
			redosier dogwood	COSES
			speckled alder	ALINR
			mint	MENTH
			goldenrod	SOLID
			cinquefoil	POTEN
			bunchberry dogwood	COCA13
			lowbush blueberry	VAAN
			horsetail	EQUIS
			sedge	CAREX
			bog Labrador tea	LEGR
			threeleaf goldthread	COTR2
			blackberry	RUBUS
14: Dawson-Loxley-----	black spruce	PIMA	leatherleaf	CHCA2
	tamarack	LALA	willow	SALIX
	eastern white pine	PIST	bulrush	SCIRP
	jack pine	PIBA2	blueberry	VACCI
	red pine	PIRE	velvetleaf	VAMY
			huckleberry	
			speckled alder	ALINR
			bog Labrador tea	LEGR
			sedge	CAREX
			bog laurel	KAPO
			sheep laurel	KAAN
			sphagnum moss	SPHAG*
15A: Croswell-----	red pine	PIRE	American starflower	TRBO2
	northern red oak	QURU	trailing arbutus	EPRE2
	quaking aspen	POTR5	clubmoss	LYCOP2
	jack pine	PIBA2	western brackenfern	PTAQ
	eastern white pine	PIST	serviceberry	AMELA
	red maple	ACRU	lowbush blueberry	VAAN
	balsam fir	ABBA	blueberry	VACCI
			sedge	CAREX
			blackberry	RUBUS
			Canada mayflower	MACA4
			wintergreen	GAPR2
			currant	RIBES
			cowheat	MELAM2
			greengreen reindeer	CLRA60
			lichen	
			sweet fern	COPE80

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
15A:				
Au Gres-----	quaking aspen	POTR5	western brackenfern	PTAQ
	balsam fir	ABBA	serviceberry	AMELA
	red maple	ACRU	twinflor	LIBO3
	eastern white pine	PIST	threeleaf goldthread	COTR2
	paper birch	BEPA	bunchberry dogwood	COCA13
	jack pine	PIBA2	honeysuckle	LONIC
	red pine	PIRE	clubmoss	LYCOP2
			bedstraw	GALIU
			velvetleaf	VAMY
			huckleberry	
			lowbush blueberry	VAAN
			hawthorn	CRATA
			bigleaf aster	ASMA2
			fringed polygala	POPA5
			partridgeberry	MIRE
			blackberry	RUBUS
			strawberry	FRAGA
			anemone	ANEMO
			American starflower	TRBO2
			yellow blue beadlily	CLBO3
			Canada mayflower	MACA4
			wintergreen	GAPR2
			lousewort	PEDIC
16B:				
Graycalm-----	bigtooth aspen	POGR4	Canada mayflower	MACA4
	northern red oak	QURU	American starflower	TRBO2
	red maple	ACRU	fringed polygala	POPA5
	red pine	PIRE	bigleaf aster	ASMA2
	paper birch	BEPA	blueberry	VACCI
	white oak	QUAL	blackberry	RUBUS
	eastern white pine	PIST	mapleleaf viburnum	VIAC
	jack pine	PIBA2	serviceberry	AMELA
	quaking aspen	POTR5	western brackenfern	PTAQ
			American witchhazel	HAVI4
			kinnikinnick	ARUV
			sedge	CAREX
			trailing arbutus	EPRE2
			sweet fern	COPE80
			cowwheat	MELAM2
			wild sarsaparilla	ARNU2
			anemone	ANEMO
			twistedstalk	STREP3
			wintergreen	GAPR2
			beaked hazelnut	COCO6
17B:				
Croswell-----	red pine	PIRE	serviceberry	AMELA
	northern red oak	QURU	western brackenfern	PTAQ
	quaking aspen	POTR5	clubmoss	LYCOP2
	jack pine	PIBA2	blueberry	VACCI
	eastern white pine	PIST	lowbush blueberry	VAAN
	red maple	ACRU	sedge	CAREX
	balsam fir	ABBA	trailing arbutus	EPRE2
			sweet fern	COPE80
			blackberry	RUBUS
			cowwheat	MELAM2
			currant	RIBES
			Canada mayflower	MACA4
			American starflower	TRBO2
			greengreen reindeer	CLRA60
			lichen	
			wintergreen	GAPR2

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
18A:				
Au Gres-----	quaking aspen	POTR5	partridgeberry	MIRE
	balsam fir	ABBA	strawberry	FRAGA
	red maple	ACRU	wintergreen	GAPR2
	eastern white pine	PIST	lousewort	PEDIC
	paper birch	BEPA	hawthorn	CRATA
	jack pine	PIBA2	bigleaf aster	ASMA2
	red pine	PIRE	honeysuckle	LONIC
			bunchberry dogwood	COCA13
			fringed polygala	POPA5
			Canada mayflower	MACA4
			western brackenfern	PTAQ
			American starflower	TRBO2
			velvetleaf	VAMY
			huckleberry	
			twinflower	LIBO3
			threelaf goldthread	COTR2
			blackberry	RUBUS
			lowbush blueberry	VAAN
			yellow blue beadlily	CLB03
			bedstraw	GALIU
			anemone	ANEMO
			clubmoss	LYCOP2
			serviceberry	AMELA
19:				
Leafriver-----	northern whitecedar	THOC2*	miterwort	MITEL
	paper birch	BEPA	American starflower	TRBO2
	black ash	FRNI	speckled alder	ALINR
	balsam fir	ABBA	redosier dogwood	COSES
	balsam poplar	POBA2	sensitive fern	ONSE
	red maple	ACRU	woodfern	DRYOP
	eastern white pine	PIST	sphagnum moss	SPHAG*
			blackberry	RUBUS
			horsetail	EQUIS
			twinflower	LIBO3
			threelaf goldthread	COTR2
			goldenrod	SOLID
			American fly	LOCA7
			honeysuckle	
			partridgeberry	MIRE
			currant	RIBES
			yellow marsh	CAPA5
			marigold	
			pyrola	PYROL
			clubmoss	LYCOP2
			bedstraw	GALIU
			lowbush blueberry	VAAN
			Canada mayflower	MACA4
			cinnamon fern	OSCI
			western brackenfern	PTAQ
			wild sarsaparilla	ARNU2
			yellow blue beadlily	CLB03
			sweet coltsfoot	PEPA31
			velvetleaf	VAMY
			huckleberry	
			fringed polygala	POPA5
			bigleaf aster	ASMA2
			trailing arbutus	EPRE2
			bristly dewberry	RUHI

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
20B, 20D, 20F: Graycalm-Grayling-----	red pine	PIRE	greengreen reindeer	CLRA60
	jack pine	PIBA2	lichen	
	bigtooth aspen	POGR4	serviceberry	AMELA
	quaking aspen	POTR5	hawthorn	CRATA
	red maple	ACRU	American witchhazel	HAVI4
	northern red oak	QURU	mapleleaf viburnum	VIAC
	eastern white pine	PIST	western brackenfern	PTAQ
	paper birch	BEPA	blueberry	VACCI
	black cherry	PRSE2	lowbush blueberry	VAAN
			sedge	CAREX
			clubmoss	LYCOP2
			Canada mayflower	MACA4
			sweet fern	COPE80
			aster	ASTER
			currant	RIBES
			American starflower	TRBO2
			pink lady's slipper	CYAC3
			wild sarsaparilla	ARNU2
			strawberry	FRAGA
			kinnikinnick	ARUV
			blackberry	RUBUS
			northern bush	DILO
			honeysuckle	
			lousewort	PEDIC
			wintergreen	GAPR2
23: Ausable-Bowstring-----	tamarack	LALA	speckled alder	ALINR
	balsam poplar	POBA2	redosier dogwood	COSES
	quaking aspen	POTR5	sensitive fern	ONSE
	jack pine	PIBA2	willow	SALIX
	northern whitecedar	THOC2*	blackberry	RUBUS
	paper birch	BEPA	sedge	CAREX
			jewelweed	IMCA
			arrowhead	SALA2
			cattail	TYPHA
			avens	GEUM
			goldenrod	SOLID
			yellow marsh	CAPA5
			marigold	
			pyrola	PYROL
			mint	MENTH

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
24A: Kinross-----	black spruce	PIMA	western brackenfern	PTAQ
	balsam fir	ABBA	bigleaf aster	ASMA2
	quaking aspen	POTR5	buckthorn	RHAMN
	red maple	ACRU	wintergreen	GAPR2
			clubmoss	LYCOP2
			serviceberry	AMELA
			creeping snowberry	GAHI2
			yellow blue beadlily	CLBO3
			Canada mayflower	MACA4
			partridgeberry	MIRE
			bunchberry dogwood	COCA13
			twinflower	LIBO3
			lowbush blueberry	VAAN
			threeleaf goldthread	COTR2
			velvetleaf	VAMY
			huckleberry	
			bog Labrador tea	LEGR
			sphagnum moss	SPHAG*
			trailing arbutus	EPRE2
Au Gres-----	quaking aspen	POTR5	honeysuckle	LONIC
	balsam fir	ABBA	hawthorn	CRATA
	red maple	ACRU	serviceberry	AMELA
	eastern white pine	PIST	western brackenfern	PTAQ
	paper birch	BEPA	clubmoss	LYCOP2
	jack pine	PIBA2	velvetleaf	VAMY
	red pine	PIRE	huckleberry	
			American starflower	TRBO2
			Canada mayflower	MACA4
			fringed polygala	POPA5
			bunchberry dogwood	COCA13
			bigleaf aster	ASMA2
			partridgeberry	MIRE
			strawberry	FRAGA
			anemone	ANEMO
			bedstraw	GALIU
			yellow blue beadlily	CLBO3
			lowbush blueberry	VAAN
			blackberry	RUBUS
			threeleaf goldthread	COTR2
			twinflower	LIBO3
			wintergreen	GAPR2
			lousewort	PEDIC

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
32B, 32C: Kellogg-----	sugar maple	ACSA3	Canada mayflower	MACA4
	northern red oak	QURU	western brackenfern	PTAQ
	paper birch	BEPA	sweet cicely	OSCL
	American basswood	TIAM	clubmoss	LYCOP2
	white ash	FRAM2	rattlesnake fern	BOVI
	black cherry	PRSE2	bedstraw	GALIU
	eastern hophornbeam	OSVI	currant	RIBES
	eastern hemlock	TSCA	bellwort	UVULA
			baneberry	ACTAE
			partridgeberry	MIRE
			violet	VIOLA
			hepatica	HEPAT
			serviceberry	AMELA
			spinulose shield fern	DRSP4
		northern maidenhair	ADPE	
		bigleaf aster	ASMA2	
		anemone	ANEMO	
		twistedstalk	STREP3	
		trillium	TRILL	
44B, 44C: Ossineke-----	sugar maple	ACSA3	trout lily	ERAM5
	northern red oak	QURU	sedge	CAREX
	American basswood	TIAM	trillium	TRILL
	paper birch	BEPA		
	American beech	FAGR		
	white ash	FRAM2		
	eastern hemlock	TSCA		
47D, 47F: Graycalm-----	bigtooth aspen	POGR4	American witchhazel	HAVI4
	northern red oak	QURU	mapleleaf viburnum	VIAC
	red maple	ACRU	western brackenfern	PTAQ
	red pine	PIRE	blueberry	VACCI
	paper birch	BEPA	kinnikinnick	ARUV
	white oak	QUAL	sedge	CAREX
	eastern white pine	PIST	trailing arbutus	EPRE2
	jack pine	PIBA2	sweet fern	COPE80
	quaking aspen	POTR5	beaked hazelnut	COCO6
			American starflower	TRBO2
			anemone	ANEMO
			wild sarsaparilla	ARNU2
			bigleaf aster	ASMA2
			blackberry	RUBUS
			twistedstalk	STREP3
			wintergreen	GAPR2
		cowwheat	MELAM2	
		fringed polygala	POPA5	
		serviceberry	AMELA	
		Canada mayflower	MACA4	

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
51: Tawas-Leafriver-----	northern whitecedar	THOC2*	poison ivy	TORA2
	black spruce	PIMA	American fly	LOCA7
	black ash	FRNI	honeysuckle	
	tamarack	LALA	sensitive fern	ONSE
	balsam fir	ABBA	woodfern	DRYOP
	balsam poplar	POBA2	sphagnum moss	SPHAG*
	paper birch	BEPA	bedstraw	GALIU
			jewelweed	IMCA
			yellow blue beadlily	CLBO3
			miterwort	MITEL
			creeping snowberry	GAHI2
			royal fern	OSRE
			interrupted fern	OSCL2
			sweet coltsfoot	PEPA31
			twinflower	LIBO3
			alternatleaf	COAL2
			dogwood	
			American starflower	TRBO2
			Canada mayflower	MACA4
			blueberry	VACCI
			partridgeberry	MIRE
			violet	VIOLA
			Jack in the pulpit	ARTR
			redosier dogwood	COSES
			bunchberry dogwood	COCA13
			bristly dewberry	RUHI
			bigleaf aster	ASMA2
			speckled alder	ALINR
			blue flag iris	IRVE2
			oakfern	GYDR
			bog Labrador tea	LEGR
			horsetail	EQUIS
			strawberry	FRAGA
			threeleaf goldthread	COTR2
54A: Algonquin-----	quaking aspen	POTR5	American witchhazel	HAVI4
	balsam fir	ABBA	currant	RIBES
	paper birch	BEPA	hepatica	HEPAT
	white spruce	PIGL	sphagnum moss	SPHAG*
	red pine	PIRE	western brackenfern	PTAQ
	red maple	ACRU	strawberry	FRAGA
			poison ivy	TORA2
			wildbergamot beebalm	MOFI
			buckthorn	RHAMN
			bristly dewberry	RUHI
			lousewort	PEDIC
			bunchberry dogwood	COCA13
			blackberry	RUBUS
			bigleaf aster	ASMA2
			meadow-rue	THALI2
			hawthorn	CRATA
			Canada mayflower	MACA4
			bedstraw	GALIU

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
58A: Wakeley-----	quaking aspen	POTR5	avens	GEUM
	balsam poplar	POBA2	blackberry	RUBUS
	northern whitecedar	THOC2*	horsetail	EQUIS
	balsam fir	ABBA	violet	VIOLA
	black ash	FRNI	speckled alder	ALINR
	paper birch	BEPA	fringed polygala	POPA5
	eastern white pine	PIST	American starflower	TRBO2
	red maple	ACRU	blueberry	VACCI
			wintergreen	GAPR2
			pyrola	PYROL
			bristly dewberry	RUHI
			clematis	CLEMA
			miterwort	MITEL
			redosier dogwood	COSES
			currant	RIBES
			willow	SALIX
			twinflor	LIBO3
			threeleaf goldthread	COTR2
			baneberry	ACTAE
			bunchberry dogwood	COCA13
			sphagnum moss	SPHAG*
			strawberry	FRAGA
			bedstraw	GALIU
			goldenrod	SOLID
			sedge	CAREX
			western brackenfern	PTAQ
			interrupted fern	OSCL2
			sensitive fern	ONSE
			woodfern	DRYOP
Allendale-----	red maple	ACRU	bristly dewberry	RUHI
	quaking aspen	POTR5	beaked hazelnut	COCO6
	northern red oak	QURU	western brackenfern	PTAQ
	white ash	FRAM2	sensitive fern	ONSE
	paper birch	BEPA	horsetail	EQUIS
	American basswood	TIAM	anemone	ANEMO
	eastern white pine	PIST	hepatica	HEPAT
	American beech	FAGR	sedge	CAREX
	eastern hophornbeam	OSVI	partridgeberry	MIRE
	white oak	QUAL	blueberry	VACCI
	balsam fir	ABBA	wintergreen	GAPR2
	red pine	PIRE	interrupted fern	OSCL2
81B, 81D, 81E, 81F: Grayling-----	jack pine	PIBA2	sedge	CAREX
	northern red oak	QURU	wintergreen	GAPR2
	eastern white pine	PIST	western brackenfern	PTAQ
	red pine	PIRE	greygreen reindeer	CLRA60
	black oak	QUVE	lichen	
			serviceberry	AMELA
			sweet fern	COPE80
			trailing arbutus	EPRE2
			lowbush blueberry	VAAN
			kinnikinnick	ARUV

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
87: Ausable-----	tamarack	LALA	arrowhead	SALA2
	balsam poplar	POBA2	jewelweed	IMCA
	quaking aspen	POTR5	avens	GEUM
	jack pine	PIBA2	goldenrod	SOLID
	northern whitecedar	THOC2*	sensitive fern	ONSE
	paper birch	BEPA	cattail	TYPHA
			willow	SALIX
			yellow marsh marigold	CAPA5
			mint	MENTH
			pyrola	PYROL
			blackberry	RUBUS
			redosier dogwood	COSES
			sedge	CAREX
			speckled alder	ALINR
90B: Chinwhisker-----	red pine	PIRE	blueberry	VACCI
	quaking aspen	POTR5	clubmoss	LYCOP2
	eastern white pine	PIST	wintergreen	GAPR2
	jack pine	PIBA2	western brackenfern	PTAQ
	black cherry	PRSE2	willow	SALIX
	balsam fir	ABBA	sedge	CAREX
110D: Mongo-----	quaking aspen	POTR5	twinflor	LIBO3
	balsam fir	ABBA	trillium	TRILL
	eastern white pine	PIST	bignone aster	ASMA2
	sugar maple	ACSA3	redosier dogwood	COSES
	paper birch	BEPA	hawthorn	CRATA
	northern whitecedar	THOC2*	strawberry	FRAGA
110F: Mongo-----	quaking aspen	POTR5	strawberry	FRAGA
	balsam fir	ABBA	trillium	TRILL
	eastern white pine	PIST	twinflor	LIBO3
	sugar maple	ACSA3	hawthorn	CRATA
	paper birch	BEPA	redosier dogwood	COSES
	northern whitecedar	THOC2*	bignone aster	ASMA2

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
123D: Klacking-----	northern red oak	QURU	clubmoss	LYCOP2
	red maple	ACRU	wintergreen	GAPR2
	paper birch	BEPA	kinnikinnick	ARUV
	red pine	PIRE	bedstraw	GALIU
	jack pine	PIBA2	fringed polygala	POPA5
	quaking aspen	POTR5	bignone aster	ASMA2
	bigtooth aspen	POGR4	bellwort	UVULA
	eastern white pine	PIST	Canada mayflower	MACA4
	northern pin oak	QUEL	false Solomon's seal	SMILA
			currant	RIBES
			violet	VIOLA
			lowbush blueberry	VAAN
			beaked hazelnut	COCO6
			serviceberry	AMELA
			American starflower	TRBO2
			American witchhazel	HAVI4
			western brackenfern	PTAQ
			blackberry	RUBUS
			trillium	TRILL
			mapleleaf viburnum	VIAC
			sedge	CAREX
			hawthorn	CRATA
			pyrola	PYROL
			velvetleaf	VAMY
			huckleberry	
144B, 144C: Perecheney-----	quaking aspen	POTR5	fringed polygala	POPA5
	red maple	ACRU	western brackenfern	PTAQ
	red pine	PIRE	cowwheat	MELAM2
	northern red oak	QURU	sweet fern	COPE80
	black oak	QUVE	American starflower	TRBO2
	black cherry	PRSE2	American witchhazel	HAVI4
	white oak	QUAL	blueberry	VACCI
			serviceberry	AMELA
			wintergreen	GAPR2
			sedge	CAREX
			lousewort	PEDIC
			anemone	ANEMO
			bignone aster	ASMA2
			twistedstalk	STREP3
			Canada mayflower	MACA4
			downy yellow violet	VIPU3
			trillium	TRILL
			blackberry	RUBUS
			bedstraw	GALIU

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
307B, 307E: Klacking-----	northern red oak	QURU	trillium	TRILL
	red maple	ACRU	wintergreen	GAPR2
	paper birch	BEPA	sedge	CAREX
	red pine	PIRE	mapleleaf viburnum	VIAC
	jack pine	PIBA2	kinnikinnick	ARUV
	bigtooth aspen	POGR4	bedstraw	GALIU
	quaking aspen	POTR5	pyrola	PYROL
	eastern white pine	PIST	false Solomon's seal	SMILA
	northern pin oak	QUEL	currant	RIBES
			lowbush blueberry	VAAN
			bellwort	UVULA
			blackberry	RUBUS
			serviceberry	AMELA
			American witchhazel	HAVI4
			beaked hazelnut	COCO6
			hawthorn	CRATA
			bigleaf aster	ASMA2
			western brackenfern	PTAQ
			clubmoss	LYCOP2
			velvetleaf	VAMY
			huckleberry	
			fringed polygala	POPA5
			American starflower	TRBO2
			Canada mayflower	MACA4
			violet	VIOLA
338B, 338E: Islandlake-----	sugar maple	ACSA3	bedstraw	GALIU
	American beech	FAGR	trillium	TRILL
	American basswood	TIAM	hairy Solomon's seal	POPU4
	white ash	FRAM2	false Solomon's seal	SMILA
	paper birch	BEPA	Canada mayflower	MACA4
	northern red oak	QURU	sedge	CAREX
	eastern hophornbeam	OSVI	clubmoss	LYCOP2
	black cherry	PRSE2	mapleleaf viburnum	VIAC
			western brackenfern	PTAQ
352B: Deford-----	quaking aspen	POTR5	willow	SALIX
	balsam fir	ABBA	horsetail	EQUIS
	red maple	ACRU	bunchberry dogwood	COCA13
			violet	VIOLA
			buckthorn	RHAMN
			twistedstalk	STREP3
			pyrola	PYROL
			partridgeberry	MIRE
			goldenrod	SOLID
			currant	RIBES
			bigleaf aster	ASMA2
			wild sarsaparilla	ARNU2
			Canada mayflower	MACA4
			American starflower	TRBO2
			sphagnum moss	SPHAG*
			threeleaf goldthread	COTR2
			velvetleaf	VAMY
			huckleberry	
			yellow blue beadlily	CLBO3
			bedstraw	GALIU
			clubmoss	LYCOP2
			western brackenfern	PTAQ
			interrupted fern	OSCL2
			sensitive fern	ONSE
			redosier dogwood	COSES

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
352B:				
Au Gres-----	quaking aspen	POTR5	velvetleaf	VAMY
	balsam fir	ABBA	huckleberry	
	red maple	ACRU	bedstraw	GALIU
	eastern white pine	PIST	western brackenfern	PTAQ
	paper birch	BEPA	serviceberry	AMELA
	jack pine	PIBA2	threeleaf goldthread	COTR2
	red pine	PIRE	lousewort	PEDIC
			hawthorn	CRATA
			blackberry	RUBUS
			lowbush blueberry	VAAN
			yellow blue beadlily	CLBO3
			twinflower	LIBO3
			anemone	ANEMO
			wintergreen	GAPR2
			strawberry	FRAGA
			partridgeberry	MIRE
			clubmoss	LYCOP2
			honeysuckle	LONIC
			American starflower	TRBO2
			Canada mayflower	MACA4
			fringed polygala	POPA5
			bunchberry dogwood	COCA13
			bignone	ASMA2
Croswell-----	red pine	PIRE	clubmoss	LYCOP2
	northern red oak	QURU	western brackenfern	PTAQ
	quaking aspen	POTR5	serviceberry	AMELA
	jack pine	PIBA2	greygreen reindeer	CLRA60
	eastern white pine	PIST	lichen	
	red maple	ACRU	American starflower	TRBO2
	balsam fir	ABBA	blueberry	VACCI
			lowbush blueberry	VAAN
			wintergreen	GAPR2
			currant	RIBES
			sedge	CAREX
			trailing arbutus	EPRE2
			sweet fern	COPE80
			blackberry	RUBUS
			cowwheat	MELAM2
			Canada mayflower	MACA4

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
360: Wakeley-----	quaking aspen	POTR5	interrupted fern	OSCL2
	balsam poplar	POBA2	sedge	CAREX
	northern whitecedar	THOC2*	goldenrod	SOLID
	balsam fir	ABBA	bedstraw	GALIU
	black ash	FRNI	blackberry	RUBUS
	paper birch	BEPA	pyrola	PYROL
	eastern white pine	PIST	woodfern	DRYOP
	red maple	ACRU	western brackenfern	PTAQ
			sensitive fern	ONSE
			sphagnum moss	SPHAG*
			violet	VIOLA
			bunchberry dogwood	COCA13
			threeleaf goldthread	COTR2
			miterwort	MITEL
			baneberry	ACTAE
			willow	SALIX
			strawberry	FRAGA
			avens	GEUM
			redosier dogwood	COSES
			horsetail	EQUIS
			blueberry	VACCI
			speckled alder	ALINR
			bristly dewberry	RUHI
			clematis	CLEMA
			wintergreen	GAPR2
			twinflower	LIBO3
			American starflower	TRBO2
		fringed polygala	POPA5	
		currant	RIBES	
362B, 362D, 362E: Millersburg-----	sugar maple	ACSA3	western brackenfern	PTAQ
	American basswood	TIAM	bigleaf aster	ASMA2
	American beech	FAGR	trillium	TRILL
	white ash	FRAM2	mapleleaf viburnum	VIAC
	bigtooth aspen	POGR4	American witchhazel	HAVI4
	quaking aspen	POTR5	serviceberry	AMELA
	northern red oak	QURU	lowbush blueberry	VAAN
	eastern white pine	PIST	violet	VIOLA
	red maple	ACRU	sedge	CAREX
	paper birch	BEPA	partridgeberry	MIRE
	eastern hophornbeam	OSVI	Canada mayflower	MACA4
			sweet cicely	OSCL
			hairy Solomon's seal	POPU4
			pyrola	PYROL
			strawberry	FRAGA
			striped maple	ACPE
			beaked hazelnut	COCO6
			hawkweed	HIERA
			American starflower	TRBO2
			downy yellow violet	VIPU3
		lousewort	PEDIC	

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
368A:				
Au Gres-----	quaking aspen	POTR5	serviceberry	AMELA
	balsam fir	ABBA	honeysuckle	LONIC
	red maple	ACRU	bigleaf aster	ASMA2
	eastern white pine	PIST	bunchberry dogwood	COCA13
	paper birch	BEPA	fringed polygala	POPA5
	jack pine	PIBA2	Canada mayflower	MACA4
	red pine	PIRE	American starflower	TRBO2
			clubmoss	LYCOP2
			western brackenfern	PTAQ
			hawthorn	CRATA
			partridgeberry	MIRE
			strawberry	FRAGA
			velvetleaf	VAMY
			huckleberry	
			wintergreen	GAPR2
			bedstraw	GALIU
			lowbush blueberry	VAAN
			blackberry	RUBUS
			threeleaf goldthread	COTR2
			twinflower	LIBO3
			lousewort	PEDIC
			anemone	ANEMO
			yellow blue beadlily	CLBO3
Deford-----	quaking aspen	POTR5	clubmoss	LYCOP2
	balsam fir	ABBA	bunchberry dogwood	COCA13
	red maple	ACRU	threeleaf goldthread	COTR2
			wild sarsaparilla	ARNU2
			bigleaf aster	ASMA2
			bedstraw	GALIU
			yellow blue beadlily	CLBO3
			velvetleaf	VAMY
			huckleberry	
			sensitive fern	ONSE
			currant	RIBES
			goldenrod	SOLID
			horsetail	EQUIS
			pyrola	PYROL
			twistedstalk	STREP3
			American starflower	TRBO2
			violet	VIOLA
			sphagnum moss	SPHAG*
			western brackenfern	PTAQ
			interrupted fern	OSCL2
			redosier dogwood	COSES
			willow	SALIX
			partridgeberry	MIRE
			buckthorn	RHAMN
			Canada mayflower	MACA4

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
369: Deford-----	quaking aspen balsam fir red maple	POTR5 ABBA ACRU	bedstraw yellow blue beadlily velvetleaf huckleberry sphagnum moss bigleaf aster clubmoss wild sarsaparilla western brackenfern interrupted fern redosier dogwood threelaf goldthread bunchberry dogwood sensitive fern buckthorn willow partridgeberry American starflower Canada mayflower currant goldenrod horsetail pyrola twistedstalk violet	GALIU CLBO3 VAMY SPHAG* ASMA2 LYCOP2 ARNU2 PTAQ OSCL2 COSES COTR2 COCA13 ONSE RHAMN SALIX MIRE TRBO2 MACA4 RIBES SOLID EQUIS PYROL STREP3 VIOLA
371: Springport-----	quaking aspen northern whitecedar black ash red maple balsam fir American basswood eastern white pine balsam poplar paper birch	POTR5 THOC2* FRNI ACRU ABBA TIAM PIST POBA2 BEPA	sedge redosier dogwood goldenrod	CAREX COSES SOLID
388B, 388D, 388E: Millersburg-Klacking- Graycalm-----	sugar maple white oak northern red oak eastern white pine quaking aspen red maple bigtooth aspen	ACSA3 QUAL QURU PIST POTR5 ACRU POGR4	western brackenfern serviceberry velvetleaf huckleberry anemone bigleaf aster lowbush blueberry Canada mayflower American starflower hairy Solomon's seal	PTAQ AMELA VAMY ANEMO ASMA2 VAAN MACA4 TRBO2 POPU4

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
390B, 390D, 390E, 390F: Horsehead-Graycalm-----	northern red oak	QURU	currant	RIBES
	black oak	QUVE	cowwheat	MELAM2
	white oak	QUAL	lowbush blueberry	VAAN
	eastern white pine	PIST	sweet fern	COPE80
	bigtooth aspen	POGR4	anemone	ANEMO
	quaking aspen	POTR5	American fly	LOCA7
	paper birch	BEPA	honeysuckle	
	black cherry	PRSE2	Canada mayflower	MACA4
	red maple	ACRU	sedge	CAREX
	white ash	FRAM2	mapleleaf viburnum	VIAC
			velvetleaf	VAMY
			huckleberry	
			cinquefoil	POTEN
			American starflower	TRBO2
			western brackenfern	PTAQ
			bigleaf aster	ASMA2
			hepatica	HEPAT
		wildbergamot beebalm	MOFI	
		hairy Solomon's seal	POPU4	
		hawthorn	CRATA	
		strawberry	FRAGA	
		serviceberry	AMELA	
		blackberry	RUBUS	
393B, 393C: Morganlake-----	sugar maple	ACSA3	bunchberry dogwood	COCA13
	red pine	PIRE	pyrola	PYROL
	American basswood	TIAM	hairy Solomon's seal	POPU4
	American beech	FAGR	American starflower	TRBO2
	bigtooth aspen	POGR4	cowwheat	MELAM2
	white ash	FRAM2	smooth yellow violet	VIPUP2
	red maple	ACRU	downy yellow violet	VIPU3
	northern red oak	QURU	Canada mayflower	MACA4
	eastern white pine	PIST	lowbush blueberry	VAAN
	yellow birch	BEAL2	blueberry	VACCI
	quaking aspen	POTR5	clubmoss	LYCOP2
	jack pine	PIBA2	wild sarsaparilla	ARNU2
	paper birch	BEPA	fringed polygala	POPA5
	eastern hophornbeam	OSVI	western brackenfern	PTAQ
	black cherry	PRSE2	spinulose shield	DRSP4
			fern	
			northern maidenhair	ADPE
			rattlesnake fern	BOVI
			American fly	LOCA7
			honeysuckle	
			serviceberry	AMELA
			blackberry	RUBUS
			wintergreen	GAPR2
		aster	ASTER	
		sedge	CAREX	
		sweet cicely	OSCL	
		violet	VIOLA	
		baneberry	ACTAE	
		lousewort	PEDIC	
		trout lily	ERAM5	
		bigleaf aster	ASMA2	
		bedstraw	GALIU	
		smooth Solomon's seal	POBI2	

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
399D: Menominee-Bamfield, sandy substratum-Blue Lake-----	sugar maple	ACSA3	American starflower	TRBO2
	white ash	FRAM2	clubmoss	LYCOP2
	American beech	FAGR	hairy Solomon's seal	POPU4
	quaking aspen	POTR5	currant	RIBES
	paper birch	BEPA	baneberry	ACTAE
	eastern hophornbeam	OSVI	bellwort	UVULA
	American basswood	TIAM	bedstraw	GALIU
	northern red oak	QURU	miterwort	MITEL
			Canada mayflower	MACA4
			trillium	TRILL
			spinulose shield fern	DRSP4
			rattlesnake fern	BOVI
			western brackenfern	PTAQ
400F: Menominee-Bamfield, sandy substratum-Blue Lake-----	sugar maple	ACSA3	trillium	TRILL
	white ash	FRAM2	baneberry	ACTAE
	American beech	FAGR	clubmoss	LYCOP2
	quaking aspen	POTR5	bedstraw	GALIU
	paper birch	BEPA	miterwort	MITEL
	eastern hophornbeam	OSVI	American starflower	TRBO2
	American basswood	TIAM	hairy Solomon's seal	POPU4
	northern red oak	QURU	Canada mayflower	MACA4
			spinulose shield fern	DRSP4
			western brackenfern	PTAQ
			currant	RIBES
			bellwort	UVULA
			rattlesnake fern	BOVI
424B, 424C: Morganlake-Ossineke, sandy substratum-Blue Lake-----	sugar maple	ACSA3	western brackenfern	PTAQ
	American basswood	TIAM	rattlesnake fern	BOVI
	white ash	FRAM2	spinulose shield fern	DRSP4
	northern red oak	QURU	clubmoss	LYCOP2
	American beech	FAGR	trout lily	ERAM5
	eastern hophornbeam	OSVI	sedge	CAREX
	black cherry	PRSE2	Canada mayflower	MACA4
	eastern hemlock	TSCA	wild sarsaparilla	ARNU2
			false Solomon's seal	SMILA
			baneberry	ACTAE
			trillium	TRILL
			sweet cicely	OSCL
			bedstraw	GALIU
			violet	VIOLA
			currant	RIBES
			twistedstalk	STREP3
			pyrola	PYROL
			American starflower	TRBO2

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
475B, 475D, 475E: Graycalm-Klacking-----	northern red oak	QURU	clubmoss	LYCOP2
	red maple	ACRU	American starflower	TRBO2
	paper birch	BEPA	wintergreen	GAPR2
	red pine	PIRE	serviceberry	AMELA
	American basswood	TIAM	sedge	CAREX
	American beech	FAGR	mapleleaf viburnum	VIAC
	bigtooth aspen	POGR4	American witchhazel	HAVI4
	eastern white pine	PIST	bigleaf aster	ASMA2
	quaking aspen	POTR5	fringed polygala	POPA5
			lousewort	PEDIC
			beaked hazelnut	COCO6
			Canada mayflower	MACA4
			hawthorn	CRATA
			western brackenfern	PTAQ
			wild sarsaparilla	ARNU2
			velvetleaf	VAMY
			huckleberry	
		spinulose shield fern	DRSP4	
		lowbush blueberry	VAAN	
		trailing arbutus	EPRE2	
		false Solomon's seal	SMILA	
		hairy Solomon's seal	POPU4	
		trillium	TRILL	
		columbine	AQUIL	
		downy yellow violet	VIPU3	
476B, 476D: Klacking-Perechney-----	quaking aspen	POTR5	serviceberry	AMELA
	black oak	QUVE	American starflower	TRBO2
	red pine	PIRE	strawberry	FRAGA
	eastern white pine	PIST	bedstraw	GALIU
	black cherry	PRSE2	hawthorn	CRATA
	red maple	ACRU	western brackenfern	PTAQ
	jack pine	PIBA2	mint	MENTH
	northern red oak	QURU	anemone	ANEMO
			velvetleaf	VAMY
			huckleberry	
			lowbush blueberry	VAAN
			wintergreen	GAPR2
			blackberry	RUBUS
		Canada mayflower	MACA4	
		bigleaf aster	ASMA2	
488A: Allendale-----	red maple	ACRU	sedge	CAREX
	quaking aspen	POTR5	sensitive fern	ONSE
	northern red oak	QURU	partridgeberry	MIRE
	white ash	FRAM2	interrupted fern	OSCL2
	paper birch	BEPA	western brackenfern	PTAQ
	American basswood	TIAM	beaked hazelnut	COCO6
	eastern white pine	PIST	blueberry	VACCI
	American beech	FAGR	hepatica	HEPAT
	eastern hophornbeam	OSVI	anemone	ANEMO
	white oak	QUAL	bristly dewberry	RUHI
	balsam fir	ABBA	wintergreen	GAPR2
	red pine	PIRE	horsetail	EQUIS

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
496B:				
Gerrish-Grayling-----	jack pine	PIBA2	sand cherry	PRPUB
	red pine	PIRE	serviceberry	AMELA
	northern red oak	QURU	western brackenfern	PTAQ
	bigtooth aspen	POGR4	lowbush blueberry	VAAN
	quaking aspen	POTR5	kinnikinnick	ARUV
	paper birch	BEPA	velvetleaf	VAMY
	black oak	QUVE	huckleberry	
	black cherry	PRSE2	greengreen reindeer lichen	CLRA60
			sweet fern	COPE80
			anemone	ANEMO
503D, 503E:				
Bamfield, sandy substratum-Millersburg-Horsehead-----	sugar maple	ACSA3	sweet cicely	OSCL
	American basswood	TIAM	anemone	ANEMO
	American beech	FAGR	mapleleaf viburnum	VIAC
	white ash	FRAM2	western brackenfern	PTAQ
	paper birch	BEPA	bignone aster	ASMA2
	northern red oak	QURU	currant	RIBES
504B, 504D, 504E:				
Coppler-Horsehead-----	bigtooth aspen	POGR4	western brackenfern	PTAQ
	red pine	PIRE	mapleleaf viburnum	VIAC
	jack pine	PIBA2	sweet fern	COPE80
	quaking aspen	POTR5	greengreen reindeer lichen	CLRA60
	red maple	ACRU		
	northern red oak	QURU	American witchhazel	HAVI4
	eastern white pine	PIST	beaked hazelnut	COCO6
			northern bush honeysuckle	DILO
			serviceberry	AMELA
			strawberry	FRAGA
			hawkweed	HIERA
			lowbush blueberry	VAAN
			Canada mayflower	MACA4
			velvetleaf	VAMY
			huckleberry	
			anemone	ANEMO
			trailing arbutus	EPRE2
			pink lady's slipper	CYAC3
			hepatica	HEPAT
			twinflower	LIBO3
			wild sarsaparilla	ARNU2
			American fly honeysuckle	LOCA7
			hawthorn	CRATA
			wintergreen	GAPR2
			blackberry	RUBUS
			bignone aster	ASMA2

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
506B, 506C: Durkeelake-----	quaking aspen	POTR5	American starflower	TRBO2
	red maple	ACRU	wintergreen	GAPR2
	balsam fir	ABBA	bunchberry dogwood	COCA13
	paper birch	BEPA	bigleaf aster	ASMA2
	sugar maple	ACSA3	fringed polygala	POPA5
	American basswood	TIAM	Canada mayflower	MACA4
	black cherry	PRSE2	hairy Solomon's seal	POPU4
	eastern white pine	PIST	velvetleaf	VAMY
	red pine	PIRE	huckleberry	
	white spruce	PIGL	false Solomon's seal	SMILA
	northern red oak	QURU	pyrola	PYROL
			strawberry	FRAGA
			violet	VIOLA
			blackberry	RUBUS
			currant	RIBES
			lousewort	PEDIC
			clubmoss	LYCOP2
			western brackenfern	PTAQ
			hawthorn	CRATA
			beaked hazelnut	COCO6
		partridgeberry	MIRE	
		mapleleaf viburnum	VIAC	
		serviceberry	AMELA	
		bedstraw	GALIU	
		hepatica	HEPAT	
		anemone	ANEMO	
507D: Islandlake-----	sugar maple	ACSA3	spinulose shield	DRSP4
	American basswood	TIAM	fern	
	white ash	FRAM2	clubmoss	LYCOP2
	northern red oak	QURU	bigleaf aster	ASMA2
	American beech	FAGR	Canada mayflower	MACA4
	paper birch	BEPA	bedstraw	GALIU
	yellow birch	BEAL2	false Solomon's seal	SMILA
	eastern hophornbeam	OSVI	hepatica	HEPAT
	eastern white pine	PIST	hairy Solomon's seal	POPU4
	black cherry	PRSE2	violet	VIOLA
			currant	RIBES
			western brackenfern	PTAQ
			rattlesnake fern	BOVI
		trillium	TRILL	
		sedge	CAREX	
		wild sarsaparilla	ARNU2	
		trout lily	ERAM5	
508B, 508D, 508E: Islandlake-Blue Lake----	sugar maple	ACSA3	twinflower	LIBO3
	American beech	FAGR	spinulose shield	DRSP4
	American basswood	TIAM	fern	
	eastern hemlock	TSCA	Canada mayflower	MACA4
	white ash	FRAM2	American witchhazel	HAVI4
	eastern hophornbeam	OSVI	western brackenfern	PTAQ
	eastern white pine	PIST	elderberry	SAMBU
	northern red oak	QURU	American starflower	TRBO2
			trillium	TRILL
			bigleaf aster	ASMA2
			sweet cicely	OSCL
			violet	VIOLA
			twistedstalk	STREP3
		wild sarsaparilla	ARNU2	
		sedge	CAREX	
		hairy Solomon's seal	POPU4	

Table 9.--Forestland Plant Communities--Continued

Map symbol and soil name	Common trees	Symbol	Characteristic vegetation	Symbol
509A: Colonville-Thunderbay---	black ash	FRNI	goldenrod	SOLID
	American basswood	TIAM	clematis	CLEMA
	balsam poplar	POBA2	greenbrier	SMILA2
	balsam fir	ABBA	poison ivy	TORA2
	northern whitecedar	THOC2*	hawthorn	CRATA
	black spruce	PIMA	blue cohosh	CATH2
	American hornbeam	CACA18	cinnamon fern	OSCI
			woodfern	DRYOP
			northern maidenhair	ADPE
			smooth Solomon's seal	POBI2
			meadow-rue	THALI2
			ostrich fern	MAST
			Canada mayflower	MACA4
			anemone	ANEMO
			nettle	URTIC
			buckthorn	RHAMN
			sensitive fern	ONSE
			trillium	TRILL
510: Deerheart-----	balsam fir	ABBA	western brackenfern	PTAQ
	eastern white pine	PIST	strawberry	FRAGA
	black ash	FRNI	redosier dogwood	COSES
	quaking aspen	POTR5	pyrola	PYROL
	red maple	ACRU	hepatica	HEPAT
	eastern hophornbeam	OSVI	goldenrod	SOLID
	eastern hemlock	TSCA	cattail	TYPHA
	red pine	PIRE	bulrush	SCIRP
			fringed polygala	POPA5
512A: Algonquin-----	quaking aspen	POTR5	American witchhazel	HAVI4
	balsam fir	ABBA	western brackenfern	PTAQ
	paper birch	BEPA	bigleaf aster	ASMA2
	white spruce	PIGL	blackberry	RUBUS
	red pine	PIRE	hepatica	HEPAT
	red maple	ACRU	hawthorn	CRATA
			sphagnum moss	SPHAG*
			Canada mayflower	MACA4
			strawberry	FRAGA
			currant	RIBES
			bedstraw	GALIU
			wildbergamot beebalm	MOFI
			poison ivy	TORA2
			buckthorn	RHAMN
			lousewort	PEDIC
			bristly dewberry	RUHI
			bunchberry dogwood	COCA13
			meadow-rue	THALI2
Springport-----	quaking aspen	POTR5	goldenrod	SOLID
	northern whitecedar	THOC2*	sedge	CAREX
	black ash	FRNI	redosier dogwood	COSES
	red maple	ACRU		
	balsam fir	ABBA		
	American basswood	TIAM		
	eastern white pine	PIST		
	balsam poplar	POBA2		
	paper birch	BEPA		

Table 10.--Plant Communities on Selected Soils

(See text for an explanation of the information in this table. Absence of an entry indicates that information was not available)

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
13----- Tawas-Lupton	N. whitecedar-----5	Balsam fir-----3	Speckled alder-----3	Crested fern-----3	Sphagnum moss-----4
	Tamarack-----4	N. whitecedar-----2	Redosier dogwood----2	Sensitive fern-----2	Bog Labrador tea----3
	Black spruce-----3	Red maple-----2			Horsetail-----3
	Balsam fir-----2	Black spruce-----2			Sedge spp.-----3
	American elm-----1	Tamarack-----2			Goldthread-----3
	Paper birch-----1				Aster spp.-----2
	Red maple-----1				Blackberry-----2
				Bunchberry-----2	
				Cinquefoil spp.-----2	
				Goldenrod spp.-----2	
				Marsh marigold-----2	
				Pyrolas spp.-----2	
				Wintergreen-----2	
				Bedstraw/cleavers---2	
				Lowbush blueberry---2	
				Canada mayflower---2	
				Mint spp.-----2	
				Starflower-----2	
				Wild sarsaparilla---2	
				Yellow blue	
				beadlily-----1	
				Meadow rue spp.-----1	
				Marsh milkweed-----1	
14----- Dawson-Loxley	Black spruce-----4	Black spruce-----3	Leatherleaf-----3	---	Sphagnum moss-----5
	Tamarack-----3	Tamarack-----2	Speckled alder-----3		Sedge spp.-----4
	N. white pine-----2	Jack pine-----2	Willow spp.-----2		Blueberry spp.-----3
	Jack pine-----2	Red pine-----2			Bog Labrador tea----3
	Red pine-----1	E. white pine-----1			Pale laurel-----3
				Bulrush spp.-----2	
				Velvetleaf	
				huckleberry-----2	
				Marsh cinquefoil---2	
				Sheep laurel-----2	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
15A: Croswell-----	Red pine-----5 Northern red oak----4 Quaking aspen-----3 Jack pine-----3 E. white pine-----3 Red maple-----2 Balsam fir-----1	Black cherry-----4 Red pine-----3 Northern red oak----3 Red maple-----3 Jack pine-----2 Balsam fir-----2 Quaking aspen-----2	Serviceberry-----3	Brackenfern-----4 Stiff clubmoss-----2	Blueberry spp.-----4 Lowbush blueberry---4 Wintergreen-----4 Sedge spp.-----3 Trailing arbutus---3 Sweetfern-----3 Blue cladonia-----2 Blackberry-----2 Cowwheat-----2 Currant/gooseberry--2 Canada mayflower---2 Starflower-----2 Reindeer lichen----2
Au Gres-----	Quaking aspen-----5 Balsam fir-----3 Red maple-----2 E. white pine-----2 Paper birch-----1 Jack pine-----1 Red pine-----1	Red maple-----3 Quaking aspen-----2 Balsam fir-----2 Black cherry-----1 Black oak-----1 E. white pine-----1	Honeysuckle spp.----2 Hawthorn spp.-----2 Serviceberry-----2	Brackenfern-----6 Ground pine-----1	Velvetleaf huckleberry-----4 Starflower-----3 Canada mayflower---3 Lousewort-----3 Fringed polygala---3 Bunchberry-----3 Bigleaf aster-----2 Partridgeberry-----2 Strawberry-----2 Wintergreen-----2 Anemone-----2 Bedstraw/cleavers---1 Yellow blue beadlily-----1 Lowbush blueberry---1 Blackberry-----1 Goldthread-----1 Indian cucumber root-----1 Twinflower-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
16----- Graycalm	Bigtooth aspen-----5	Red maple-----3	Serviceberry-----2	Brackenfern-----5	Blueberry spp.-----4
	Northern red oak---5	Northern red oak---3	Beaked hazelnut----2		Kinnikinnick-----3
	Red maple-----3	E. white pine-----3	Witch hazel-----2		Sedge spp.-----3
	Red pine-----3	Bigtooth aspen-----2	Mapleleaf viburnum--1		Trailing arbutus---3
	Paper birch-----2	Quaking aspen-----2			Canada mayflower---3
	White oak-----2	Black cherry-----2			Wintergreen-----3
	E. white pine-----2	Paper birch-----2			Sweetfern-----2
	Jack pine-----2	Red pine-----2			Fringed polygala---2
	Quaking aspen-----1	White oak-----1			Cowheat-----2
					Starflower-----2
			Wild sarsaparilla---2		
			Twistedstalk-----2		
			Bigleaf aster-----1		
			Anemone-----1		
			Blackberry-----1		
17B----- Croswell	Red pine-----5	Black cherry-----4	Serviceberry-----3	Brackenfern-----4 Stiff clubmoss-----2	Blueberry spp.-----4
	Northern red oak---4	Red pine-----3			Lowbush blueberry---4
	Quaking aspen-----3	Northern red oak---3			Wintergreen-----4
	Jack pine-----3	Red maple-----3			Sedge spp.-----3
	E. white pine-----3	Jack pine-----2			Trailing arbutus---3
	Red maple-----2	Balsam fir-----2			Sweetfern-----3
	Balsam fir-----1	Quaking aspen-----2			Blue cladonia-----2
					Blackberry-----2
			Cowheat-----2		
			Currant/gooseberry--2		
			Canada mayflower---2		
			Starflower-----2		
			Reindeer lichen----2		

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
18A----- Au Gres	Quaking aspen-----5	Red maple-----3	Honeysuckle spp.----2	Brackenfern-----6	Velvetleaf
	Balsam fir-----3	Quaking aspen-----2	Hawthorn spp.-----2	Ground pine-----1	huckleberry-----4
	Red maple-----2	Balsam fir-----2	Serviceberry-----2		Starflower-----3
	E. white pine-----2	Black cherry-----1			Canada mayflower---3
	Paper birch-----1	Black oak-----1			Lousewort-----3
	Jack pine-----1	E. white pine-----1			Fringed polygala---3
	Red pine-----1				Bunchberry-----3
				Bigleaf aster-----2	
				Partridgeberry-----2	
				Strawberry-----2	
				Wintergreen-----2	
				Anemone-----2	
				Bedstraw/cleavers---1	
				Yellow blue	
				beadlily-----1	
				Lowbush blueberry---1	
				Blackberry-----1	
				Goldthread-----1	
				Indian cucumber	
				root-----1	
				Twinflower-----1	
19----- Leafriver	N. whitecedar-----4	Balsam fir-----4	American fly	Staghorn clubmoss---2	Horsetail-----4
	Paper birch-----3	Black ash-----2	honeysuckle-----1	Stiff clubmoss-----2	Bedstraw/cleavers---3
	Black ash-----2	E. whitecedar-----2	Speckled alder-----1	Brackenfern-----1	Northern dewberry---3
	Balsam fir-----2	E. white pine-----1	Redosier dogwood----1	Cinnamon fern-----1	Fringed polygala---3
	Balsam poplar-----1			Sensitive fern-----1	Heal all-----3
	Red maple-----1			Wood fern-----1	Miterwort spp.-----3
	E. white pine-----1				Yellow blue
					beadlily-----2
					Velvetleaf
				huckleberry-----2	
				Goldthread-----2	
				Sphagnum moss-----2	
				Starflower-----2	
				Sweet coltsfoot-----2	
				Canada mayflower---2	
				Wild sarsaparilla---2	
				Bigleaf aster-----1	
				Lowbush blueberry---1	
				Blackberry-----1	
				Currant/gooseberry--1	
				Goldenrod spp.-----1	
				Partridgeberry-----1	
				Pyrolas spp.-----1	
				Trailing arbutus---1	
				Twinflower-----1	
				Marsh marigold-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
20B, 20D, 20F-- Graycalm- Grayling	Red pine-----5	Red maple-----3	Serviceberry-----3	Brackenfern-----5	Lowbush blueberry---4
	Jack pine-----5	Northern red oak---3	Witch hazel-----2	Stiff clubmoss-----2	Blackberry-----4
	Bigtooth aspen-----4	Quaking aspen-----3	Mapleleaf viburnum--1	Ground cedar-----1	Wintergreen-----4
	Quaking aspen-----3	Black cherry-----3	Hawthorn spp.-----1	Staghorn clubmoss---1	Sedge spp.-----3
	Red maple-----3	Jack pine-----3	Northern bush		Sweetfern-----3
	Northern red oak---3	Bigtooth aspen-----2	honeysuckle-----1		Canada mayflower---3
	E. white pine-----3	E. white pine-----1			Blueberry spp.-----3
	Paper birch-----2	American beech-----1			Kinnikinnick-----3
	Black cherry-----2	Black cherry-----1			Aster spp.-----2
		Red pine-----1			Black snakeroot----2
		Balsam fir-----1			Currant/gooseberry--2
		Paper birch-----1			Wild sarsaparilla---2
					Blue cladonia-----2
				Reindeer lichen----2	
				Strawberry-----2	
				Pink lady slipper--1	
				Starflower-----1	
				Lousewort-----1	
23----- Ausable- Bowstring	Tamarack-----3	Balsam poplar-----3	Speckled alder-----3	Sensitive fern-----2	Sedge spp.-----4
	Balsam poplar-----3	Quaking aspen-----2	Willow spp.-----3		Cattails-----3
	Quaking aspen-----2	E. white pine-----1	Redosier dogwood---2		Blackberry-----3
	Jack pine-----2	Jack pine-----1			Goldenrod spp.-----3
	N. whitecedar-----1				Boneset-----2
	Paper birch-----1				Jewelweed-----2
					Marsh marigold----2
				Mint spp.-----2	
				Arrowhead-----2	
				Pyrolas spp.-----1	
				Avens-----1	
24A: Kinross-----	Black spruce-----3	Balsam fir-----2	Buckthorn-----3	Brackenfern-----2	Bunchberry-----4
	Balsam fir-----2	Red maple-----2	Serviceberry-----1	Stiff clubmoss-----1	Velvetleaf
	Quaking aspen-----2	Black cherry-----1		Ground pine-----1	huckleberry-----3
	Red maple-----1	Black oak-----1			Goldthread-----3
					Canada mayflower---3
				Wintergreen-----3	
				Yellow blue	
				beadlily-----2	
				Lowbush blueberry---2	
				Sphagnum moss-----2	
				Partridgeberry-----2	
				Trailing arbutus---2	
				Twinflower-----2	
				Creeping snowberry--2	
				Bigleaf aster-----1	
				Bog Labrador tea---1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
24A: Au Gres-----	Quaking aspen-----5 Balsam fir-----3 Red maple-----2 E. white pine-----2 Paper birch-----1 Jack pine-----1 Red pine-----1	Red maple-----3 Quaking aspen-----2 Balsam fir-----2 Black cherry-----1 Black oak-----1 E. white pine-----1	Honeysuckle spp.----2 Hawthorn spp.-----2 Serviceberry-----2	Brackenfern-----6 Ground pine-----1	Velvetleaf huckleberry-----4 Starflower-----3 Canada mayflower---3 Lousewort-----3 Fringed polygala---3 Bunchberry-----3 Bigleaf aster-----2 Partridgeberry-----2 Strawberry-----2 Wintergreen-----2 Anemone-----2 Bedstraw/cleavers---1 Yellow blue beadlily-----1 Lowbush blueberry---1 Blackberry-----1 Goldthread-----1 Indian cucumber root-----1 Twinflower-----1
32B, 32C----- Kellogg	Sugar maple-----4 Northern red oak----3 Paper birch-----3 American basswood---2 White ash-----2 Black cherry-----1 E. hophornbeam-----1 Eastern hemlock----1	White ash-----4 Sugar maple-----3 Northern red oak----3 American basswood---1 E. hophornbeam-----1 American beech-----1 Quaking aspen-----1 Black cherry-----1	Serviceberry-----1	Ground pine-----2 Spinulose shield fern-----1 Brackenfern-----1 Maidenhair fern----1 Rattlesnake fern----1	Sweet cicely-----3 Canada mayflower---3 Bedstraw/cleavers---2 Partridgeberry-----2 Baneberry-----1 Bellworts-----1 Currant/gooseberry--1 Hepatica-----1 Violet spp.-----1 Anemone-----1 Bigleaf aster-----1 Trillium-----1 Twistedstalk-----1
44B, 44C----- Ossineke	Sugar maple-----4 Northern red oak----4 American basswood---3 Paper birch-----2 American beech-----1 White ash-----1 Eastern hemlock----1	Sugar maple-----2 Eastern hemlock----1	---	---	Trout lily-----3 Sedge spp.-----3 Trillium-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
47D, 47F----- Graycalm	Bigtooth aspen-----5	Red maple-----3	Serviceberry-----2	Brackenfern-----5	Blueberry spp.-----4
	Northern red oak---5	Northern red oak---3	Beaked hazelnut----2		Kinnikinnick-----3
	Red maple-----3	E. white pine-----3	Witch hazel-----2		Sedge spp.-----3
	Red pine-----3	Bigtooth aspen-----2	Mapleleaf viburnum--1		Trailing arbutus---3
	Paper birch-----2	Quaking aspen-----2			Canada mayflower---3
	White oak-----2	Black cherry-----2			Wintergreen-----3
	E. white pine-----2	Paper birch-----2			Sweetfern-----2
	Jack pine-----2	Red pine-----2			Fringed polygala---2
	Quaking aspen-----1	White oak-----1			Cowheat-----2
					Starflower-----2
			Wild sarsaparilla---2		
			Twistedstalk-----2		
			Bigleaf aster-----1		
			Anemone-----1		
51----- Tawas- Leafriver	E. whitecedar-----4	Balsam fir-----5	Speckled alder-----4	Wood fern-----2	Sphagnum moss-----6
	Black spruce-----3	N. whitecedar-----1	Alternateleaf	Oak fern-----2	Northern dewberry---3
	Black ash-----3	Black spruce-----1	dogwood-----2	Royal fern-----1	Goldthread-----3
	Tamarack-----3	Paper birch-----1	Redosier dogwood---2	Interrupted fern---1	Bog Labrador tea---3
	Balsam fir-----3	Red maple-----1	American fly	Sensitive fern-----1	Twinflower-----3
	Balsam poplar-----2		honeysuckle-----1		Creeping snowberry--3
	Paper birch-----1				Miterwort spp.-----3
					Yellow blue
					beadlily-----3
					Horsetail-----3
					Jewelweed-----3
					Bedstraw/cleavers---2
					Bunchberry-----2
				Sweet coltsfoot----2	
				Bigleaf aster-----1	
				Blueberry spp.-----1	
				Blueflag-----1	
				Jack-in-the-pulpit--1	
				Canada mayflower---1	
				Strawberry-----1	
				Poison ivy-----1	
				Partridgeberry-----1	
				Starflower-----1	
				Violet spp.-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
54A----- Algonquin	Quaking aspen-----3 Balsam fir-----3 Paper birch-----2 White spruce-----2 Red pine-----1	Balsam fir-----4 Northern red oak---2 White spruce-----2 Quaking aspen-----1 Black cherry-----1	Buckthorn spp.-----2 Hawthorn spp.-----1 Witch hazel-----1	Brackenfern-----1	Bigleaf aster-----3 Black snakeroot-----3 Northern dewberry---3 Hepatica-----3 Bunchberry-----2 Sphagnum moss-----2 Canada mayflower---2 Strawberry-----2 Lousewort-----2 Bedstraw/cleavers---1 Blackberry-----1 Currant/gooseberry--1 Meadow rue spp.-----1 Wild bergamot-----1 Poison ivy-----1
58A: Wakeley-----	Quaking aspen-----3 Balsam poplar-----3 N. whitecedar-----3 Balsam fir-----3 Black ash-----1 Paper birch-----1 E. white pine-----1 Red maple-----1	Balsam fir-----3 Black ash-----2 Balsam poplar-----1 Red maple-----1 Paper birch-----1	Speckled alder-----3 Redosier dogwood---3 Willow spp.-----2	Sensitive fern-----2 Brackenfern-----2 Wood fern-----2 Interrupted fern---1	Sedge spp.-----4 Goldenrod spp.-----4 Black snakeroot-----3 Bedstraw/cleavers---3 Northern dewberry---3 Pyrolas spp.-----3 Strawberry-----3 Clematis-----3 Avens-----3 Horsetail-----3 Sphagnum moss-----3 Violet spp.-----2 Bunchberry-----2 Goldthread-----2 Miterwort spp.-----2 Baneberry-----1 Blackberry-----1 Blueberry spp.-----1 Currant/gooseberry--1 Fringed polygala---1 Pyrolas spp.-----1 Starflower-----1 Twinflower-----1 Wintergreen-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
58A:					
Allendale-----	Red maple-----4 Quaking aspen-----3 Northern red oak---3 White ash-----3 Paper birch-----3 American basswood--2 E. white pine-----2 American beech-----1 E. hophornbeam-----1 White oak-----1 Balsam fir-----1 Red pine-----1	American beech-----2 E. white pine-----2 Red pine-----2 E. hophornbeam-----1	Beaked hazelnut-----3	Brackenfern-----4 Interrupted fern----1 Sensitive fern-----1	Sedge spp.-----4 Wintergreen-----4 Blueberry spp.-----3 Hepatica-----3 Anemone-----2 Northern dewberry---2 Horsetail-----1 Partridgeberry-----1
81B, 81D, 81D, 81F-----	Jack pine-----5 Northern red oak---3 E. white pine-----2 Red pine-----2 Black oak-----2	Jack pine-----3 Red pine-----2 E. white pine-----2 Black oak-----2 Northern red oak---1	Serviceberry-----2	Brackenfern-----3	Lowbush blueberry---5 Kinnikinnick-----3 Blue cladonia-----3 Trailing arbutus---3 Sedge spp.-----3 Reindeer lichen---3 Sweetfern-----3 Wintergreen-----2
87-----	Tamarack-----3 Balsam poplar-----3 Quaking aspen-----2 Jack pine-----2 N. whitecedar-----1 Paper birch-----1	Balsam poplar-----3 Quaking aspen-----2 E. white pine-----1 Jack pine-----1	Speckled alder-----3 Willow spp.-----3 Redosier dogwood---2	Sensitive fern-----2	Sedge spp.-----4 Cattails-----3 Blackberry-----3 Goldenrod spp.-----3 Boneset-----2 Jewelweed-----2 Marsh marigold-----2 Mint spp.-----2 Arrowhead-----2 Pyrolas spp.-----1 Avens-----1
90B-----	Red pine-----4 Quaking aspen-----2 E. white pine-----2 Jack pine-----2 Black cherry-----1 Balsam fir-----1	Black cherry-----3 Northern red oak---3 E. white pine-----2 Jack pine-----2 Red pine-----1	Willow spp.-----2	Brackenfern-----5 Staghorn clubmoss---1 Ground pine-----1	Wintergreen-----5 Blueberry spp.-----4 Sedge spp.-----3
110D, 110F-----	Quaking aspen-----3 Balsam fir-----3 E. white pine-----3 Sugar maple-----2 Paper birch-----1 N. whitecedar-----1	Balsam fir-----4 E. white pine-----3 N. whitecedar-----1	Redosier dogwood---1 Hawthorn spp.-----1	---	Strawberry-----2 Bigleaf aster-----2 Trillium-----2 Twinflower-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
123D----- Klacking	Northern red oak---5	Red maple-----3	Serviceberry-----3	Brackenfern-----5	Velvetleaf
	Red maple-----4	E. white pine-----3	Mapleleaf viburnum--3	Ground pine-----2	huckleberry-----3
	Paper birch-----3	Northern red oak---3	Beaked hazelnut-----2		Starflower-----3
	Red pine-----3	Pin oak-----2	Hawthorn spp.-----1		Wintergreen-----3
	Jack pine-----2	E. hophornbeam-----2	Witch hazel-----1		Sedge spp.-----3
	Quaking aspen-----2	Balsam fir-----2			Kinnikinnick-----2
	Bigtooth aspen-----2	Red pine-----1			Bigleaf aster-----2
	E. white pine-----2	Quaking aspen-----1			Fringed polygala----2
	Pin oak-----2	American beech-----1			Canada mayflower----2
		Black cherry-----1			Bellwort-----1
		Sugar maple-----1			Lowbush blueberry---1
		White ash-----1			Currant/gooseberry--1
					False Solomon's seal-----1
				Pyrolas spp.-----1	
				Trillium-----1	
				Violet spp.-----1	
				Bedstraw/cleavers---1	
				Blackberry-----1	
144B, 144C---- Perechney	Quaking aspen-----4	Red maple-----3	Serviceberry-----2	Brackenfern-----3	Sedge spp.-----4
	Red maple-----4	Black cherry-----3	Witch hazel-----2		Blueberry spp.-----3
	Red pine-----3	Balsam fir-----2			Wintergreen-----3
	Northern red oak---3	Northern red oak---2			Starflower-----3
	Black oak-----2				Bedstraw/cleavers---2
	Black cherry-----1				Cowheat-----2
	White oak-----1				Canada mayflower----2
				Fringed polygala----2	
				Bigleaf aster-----2	
				Twistedstalk-----2	
				Lousewort-----2	
				Trillium-----1	
				Downy yellow violet 1	
				Blackberry-----1	
				Sweetfern-----1	
				Anemone-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
307B, 307E----- Klackung	Northern red oak----5	Red maple-----3	Serviceberry-----3	Brackenfern-----5	Velvetleaf
	Red maple-----4	E. white pine-----3	Mapleleaf viburnum--3	Ground pine-----2	huckleberry-----3
	Paper birch-----3	Northern red oak----3	Beaked hazelnut-----2		Starflower-----3
	Red pine-----3	Pin oak-----2	Hawthorn spp.-----1		Wintergreen-----3
	Jack pine-----2	E. hophornbeam-----2	Witch hazel-----1		Sedge spp.-----3
	Quaking aspen-----2	Balsam fir-----2			Kinnikinnick-----2
	Bigtooth aspen-----2	Red pine-----1			Bigleaf aster-----2
	E. white pine-----2	Quaking aspen-----1			Fringed polygala----2
	Pin oak-----2	American beech-----1			Canada mayflower----2
		Black cherry-----1			Bellwort-----1
		Sugar maple-----1			Lowbush blueberry---1
		White ash-----1			Currant/gooseberry--1
					False Solomon's seal-----1
				Pyrolas spp.-----1	
				Trillium-----1	
				Violet spp.-----1	
				Bedstraw/cleavers---1	
				Blackberry-----1	
338B, 338E----- Islandlake	Sugar maple-----5	American beech-----3	Mapleleaf viburnum--1	Brackenfern-----3	Sedge spp.-----2
	American beech-----4	American basswood---2		Stiff clubmoss-----2	Bedstraw/cleavers---1
	American basswood---2	White ash-----2		Ground pine-----2	False Solomon's seal-----1
	White ash-----2	Sugar maple-----2			Hairy Solomon's seal-----1
	Paper birch-----2	E. hophornbeam-----2			Trillium-----1
	Northern red oak---2	Black cherry-----1			Canada mayflower---1
	E. hophornbeam-----1	Chokecherry-----1			
	Black cherry-----1	Red maple-----1			
352B: Deford-----	Quaking aspen-----4	---	Buckthorn spp.-----2	Interrupted fern----1	Bunchberry-----3
	Balsam fir-----4		Redosier dogwood---1	Brackenfern-----1	Goldthread-----3
	Red maple-----2		Willow spp.-----1	Sensitive fern-----1	Wild sarsaparilla---3
				Staghorn clubmoss---1	Bigleaf aster-----2
				Stiff clubmoss-----1	Bedstraw/cleavers---2
					Yellow blue beadlily-----2
					Velvetleaf huckleberry-----2
					Sphagnum moss-----2
					Partridgeberry-----2
					Canada mayflower---2
				Currant/gooseberry--1	
				Goldenrod spp.-----1	
				Horsetail-----1	
				Pyrolas spp.-----1	
				Twistedstalk-----1	
				Starflower-----1	
				Violet spp.-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
352B:					
Au Gres-----	Quaking aspen-----5 Balsam fir-----3 Red maple-----2 E. white pine-----2 Paper birch-----1 Jack pine-----1 Red pine-----1	Red maple-----3 Quaking aspen-----2 Balsam fir-----2 Black cherry-----1 Black oak-----1 E. white pine-----1	Honeysuckle spp.----2 Hawthorn spp.-----2 Serviceberry-----2	Brackenfern-----6 Ground pine-----1	Velvetleaf huckleberry-----4 Starflower-----3 Canada mayflower---3 Lousewort-----3 Fringed polygala---3 Bunchberry-----3 Bigleaf aster-----2 Partridgeberry-----2 Strawberry-----2 Wintergreen-----2 Anemone-----2 Bedstraw/cleavers---1 Yellow blue beadlily-----1 Lowbush blueberry---1 Blackberry-----1 Goldthread-----1 Indian cucumber root-----1 Twinflower-----1
Croswell-----	Red pine-----5 Northern red oak----4 Quaking aspen-----3 Jack pine-----3 E. white pine-----3 Red maple-----2 Balsam fir-----1	Black cherry-----4 Red pine-----3 Northern red oak----3 Red maple-----3 Jack pine-----2 Balsam fir-----2 Quaking aspen-----2	Serviceberry-----3	Brackenfern-----4 Stiff clubmoss-----2	Blueberry spp.-----4 Lowbush blueberry---4 Wintergreen-----4 Sedge spp.-----3 Trailing arbutus---3 Sweetfern-----3 Blue cladonia-----2 Blackberry-----2 Cowheat-----2 Currant/gooseberry--2 Canada mayflower---2 Starflower-----2 Reindeer lichen----2

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
360----- Wakeley	Quaking aspen-----3	Balsam fir-----3	Speckled alder-----3	Sensitive fern-----2	Sedge spp.-----4
	Balsam poplar-----3	Black ash-----2	Redosier dogwood---3	Brackenfern-----2	Goldenrod spp.-----4
	N. whitecedar-----3	Balsam poplar-----1	Willow spp.-----2	Wood fern-----2	Black snakeroot-----3
	Balsam fir-----3	Red maple-----1		Interrupted fern---1	Bedstraw/cleavers---3
	Black ash-----1	Paper birch-----1			Northern dewberry---3
	Paper birch-----1				Pyrolas spp.-----3
	E. white pine-----1				Strawberry-----3
	Red maple-----1				Clematis-----3
					Avens-----3
				Horsetail-----3	
				Sphagnum moss-----3	
				Violet spp.-----2	
				Bunchberry-----2	
				Goldthread-----2	
				Miterwort spp.-----2	
				Baneberry-----1	
				Blackberry-----1	
				Blueberry spp.-----1	
				Currant/gooseberry--1	
				Fringed polygala---1	
				Starflower-----1	
				Twinflower-----1	
				Wintergreen-----1	
362B, 362D, 362E----- Millersburg	Sugar maple-----4	Sugar maple-----3	Serviceberry-----2	Brackenfern-----5	Bigleaf aster-----3
	American basswood---3	Red maple-----3	Striped maple-----2		Lousewort-----3
	American beech-----3	Northern red oak---3	Beaked hazelnut---2		Sedge spp.-----3
	White ash-----3	E. hophornbeam-----3	Witch hazel-----1		Trillium-----2
	Bigtooth aspen-----3	American beech-----3	Mapleleaf viburnum--1		Strawberry-----2
	Quaking aspen-----3	White ash-----3			Hawkweed spp.-----1
	Northern red oak---3	American basswood---2			Lowbush blueberry---1
	E. white pine-----2	Bigtooth aspen-----2			Indian cucumber root-----1
	Red maple-----2	Quaking aspen-----2			Canada mayflower---1
	Paper birch-----2	E. white pine-----2			Downy yellow violet 1
	E. hophornbeam-----1	Paper birch-----1			Violet spp.-----1
		Black cherry-----1			Sweet cicely-----1
					Starflower-----1
				Hairy Solomon's seal-----1	
				Pyrolas spp.-----1	
				Partridgeberry-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
368A:					
Au Gres-----	Quaking aspen-----5 Balsam fir-----3 Red maple-----2 E. white pine-----2 Paper birch-----1 Jack pine-----1 Red pine-----1	Red maple-----3 Quaking aspen-----2 Balsam fir-----2 Black cherry-----1 Black oak-----1 E. white pine-----1	Honeysuckle spp.----2 Hawthorn spp.-----2 Serviceberry-----2	Brackenfern-----6 Ground pine-----1	Velvetleaf huckleberry-----4 Starflower-----3 Canada mayflower---3 Lousewort-----3 Fringed polygala---3 Bunchberry-----3 Bigleaf aster-----2 Partridgeberry-----2 Strawberry-----2 Wintergreen-----2 Anemone-----2 Bedstraw/cleavers---1 Yellow blue beadlily-----1 Lowbush blueberry---1 Blackberry-----1 Goldthread-----1 Indian cucumber root-----1 Twinflower-----1
Deford-----	Quaking aspen-----4 Balsam fir-----4 Red maple-----2	---	Buckthorn spp.-----2 Redosier dogwood----1 Willow spp.-----1	Interrupted fern---1 Brackenfern-----1 Sensitive fern-----1 Staghorn clubmoss---1 Stiff clubmoss-----1	Bunchberry-----3 Goldthread-----3 Wild sarsaparilla---3 Bigleaf aster-----2 Bedstraw/cleavers---2 Yellow blue beadlily-----2 Velvetleaf huckleberry-----2 Sphagnum moss-----2 Partridgeberry-----2 Canada mayflower---2 Currant/gooseberry--1 Goldenrod spp.-----1 Horsetail-----1 Pyrolas spp.-----1 Twistedstalk-----1 Starflower-----1 Violet spp.-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
369----- Deford	Quaking aspen-----4 Balsam fir-----4 Red maple-----2	---	Buckthorn spp.-----2 Redosier dogwood---1 Willow spp.-----1	Interrupted fern---1 Brackenfern-----1 Sensitive fern-----1 Staghorn clubmoss---1 Stiff clubmoss-----1	Bunchberry-----3 Goldthread-----3 Wild sarsaparilla---3 Bigleaf aster-----2 Bedstraw/cleavers---2 Yellow blue beadlily-----2 Velvetleaf huckleberry-----2 Sphagnum moss-----2 Partridgeberry-----2 Canada mayflower---2 Currant/gooseberry--1 Goldenrod spp.-----1 Horsetail-----1 Pyrolas spp.-----1 Twistedstalk-----1 Starflower-----1 Violet spp.-----1
371----- Springport	Quaking aspen-----4 N. whitecedar-----3 Black ash-----2 Red maple-----2 Balsam fir-----2 American basswood---1 E. white pine-----1 Balsam poplar-----1 Paper birch-----1	Balsam fir-----2	Redosier dogwood---1	---	Goldenrod spp.-----3 Sedge spp.-----2
388B, 388D, 388E----- Millersburg- Klacking- Graycalm	Sugar maple-----4 White oak-----4 Northern red oak---3 E. white pine-----1 Quaking aspen-----1 Red maple-----1 Bigtooth aspen-----1	Sugar maple-----4 Quaking aspen-----2 E. white pine-----2 Black cherry-----1 Northern red oak---1 White oak-----1 Balsam fir-----1 White spruce-----1	Serviceberry-----2	Brackenfern-----5	Anemone-----3 Lowbush blueberry---2 Bigleaf aster-----1 Velvetleaf huckleberry-----1 Hairy Solomon's seal-----1 Starflower-----1 Canada mayflower---1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
390B, 390D, 390E, 390F--- Graycalm- Horsehead	Northern red oak----4	Bigtooth aspen-----3	Serviceberry-----2	Brackenfern-----4	Sedge spp.-----5
	Black oak-----4	Black oak-----3	American fly		Lowbush blueberry---3
	White oak-----3	Northern red oak---3	honeysuckle-----2		Anemone-----3
	E. white pine-----3	White ash-----3	Hawthorn spp.-----1		Blackberry-----3
	Bigtooth aspen-----1	E. white pine-----2	Mapleleaf viburnum--1		Canada mayflower---3
	Quaking aspen-----1	Black cherry-----2			Hairy Solomon's seal-----3
	Paper birch-----1	Red pine-----2			Hepatica-----2
	Black cherry-----1	Red maple-----2			Wild bergamot-----2
	Red maple-----1	Chokecherry-----1			Bigleaf aster-----2
	White ash-----1	Balsam fir-----1			Starflower-----2
					Cinquefoil-----1
					Velvetleaf huckleberry-----1
					Cowheat-----1
					Sweetfern-----1
			Strawberry-----1		
			Currant/gooseberry--1		
393B, 393C----- Morganlake	Sugar maple-----5	Sugar maple-----3	Serviceberry-----3	Brackenfern-----5	Blueberry spp.-----3
	Red pine-----4	American beech-----3	American fly		Rattlesnake fern---2
	American basswood---3	E. hophornbeam-----3	honeysuckle-----1		Maidenhair fern---2
	American beech-----3	White ash-----3			Spinulose shield fern-----2
	Bigtooth aspen-----3	Red maple-----3			Tree clubmoss-----2
	White ash-----3	Northern red oak---3			Stiff clubmoss-----2
	Red maple-----3	Black cherry-----2			
	Northern red oak---3	Balsam fir-----2			
	E. white pine-----3	E. white pine-----2			
	Yellow birch-----2	Red pine-----2			
	Quaking aspen-----2				
	Jack pine-----2				
	Paper birch-----1				
	E. hophornbeam-----1				
	Black cherry-----1				
				Wintergreen-----3	
				Trout lily-----3	
				Bigleaf aster-----3	
				Sweet cicely-----3	
				Downy yellow violet 3	
				Smooth yellow violet-----3	
				Aster spp.-----2	
				Pyrolas spp.-----2	
				Solomon's seal-----2	
				Starflower-----2	
				Blackberry-----2	
				Fringed polygala---2	
				Bedstraw/cleavers---2	
				Bunchberry-----2	
				Cowheat-----2	
				Wild sarsaparilla---2	
				Lousewort-----2	
				Baneberry-----1	
				Violet spp.-----1	
				Hairy Solomon's seal-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
399D----- Menominee- Bamfield, sandy substratum- Blue Lake	Sugar maple-----4	Sugar maple-----4	---	Brackenfern-----3	Bedstraw/cleavers---3
	White ash-----3	White ash-----3		Rattlesnake fern---1	Miterwort spp.-----2
	American beech-----2	Balsam fir-----2		Spinulose shield	Starflower-----2
	Quaking aspen-----2	American basswood---1		fern-----1	Trillium-----2
	Paper birch-----2	E. hophornbeam-----1		Shining clubmoss---1	Canada mayflower---2
	E. hophornbeam-----1				Baneberry-----1
	American basswood---1				Bellworts-----1
	Northern red oak---1				Currant/gooseberry--1
			Hairy Solomon's seal-----1		
400F----- Menominee- Bamfield, sandy substratum- Blue Lake	Sugar maple-----4	Sugar maple-----4	---	Brackenfern-----3	Bedstraw/cleavers---3
	White ash-----3	White ash-----3		Rattlesnake fern---1	Miterwort spp.-----2
	American beech-----2	Balsam fir-----2		Spinulose shield	Starflower-----2
	Quaking aspen-----2	American basswood---1		fern-----1	Trillium-----2
	Paper birch-----2	E. hophornbeam-----1		Shining clubmoss---1	Canada mayflower---2
	E. hophornbeam-----1				Baneberry-----1
	American basswood---1				Bellworts-----1
	Northern red oak---1				Currant/gooseberry--1
			Hairy Solomon's seal-----1		
424B, 424C----- Morganlake- Ossineke, sandy substratum- Blue Lake	Sugar maple-----5	Sugar maple-----4	---	Brackenfern-----3	Sedge spp.-----3
	American basswood---3	E. hophornbeam-----2		Spinulose shield	Starflower-----3
	White ash-----3	Sugar maple-----2		fern-----1	Violet spp.-----3
	Northern red oak---2	American beech-----2		Rattlesnake fern---1	Canada mayflower---3
	American beech-----1	American basswood---1		Shining clubmoss---1	Trout lily-----3
	E. hophornbeam-----1	Black cherry-----1			Trillium-----3
	Black cherry-----1	Northern red oak---1			Wild sarsaparilla---3
	Eastern hemlock-----1				Pyrolas spp.-----2
			Twistedstalk-----2		
			Currant/gooseberry--1		
			False Solomon's seal-----1		
			Baneberry-----1		
			Bedstraw/cleavers---1		
			Sweet cicely-----1		

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
475B, 475D, 475E----- Graycalm- Klacking	Northern red oak----5	Red maple-----3	Serviceberry-----3	Brackenfern-----4	Velvetleaf
	Red maple-----3	Northern red oak----3	Mapleleaf viburnum--3	Spinulose shield	huckleberry-----4
	Paper birch-----2	Black cherry-----3	Witch hazel-----3	fern-----1	Lowbush blueberry---3
	Red pine-----2	E. white pine-----3	Beaked hazelnut-----1	Staghorn clubmoss---1	Wintergreen-----3
	American basswood---1	Sugar maple-----2	Hawthorn spp.-----1	Ground cedar-----1	Starflower-----3
	American beech-----1	American beech-----1			Wild sarsaparilla---3
	Bigtooth aspen-----1	Chokecherry-----1			Sedge spp.-----2
	E. white pine-----1	E. hophornbeam-----1			Trailing arbutus---2
	Quaking aspen-----1				False Solomon's seal-----2
					Hairy Solomon's seal-----2
					Canada mayflower---2
475B, 476D----- Klacking- Perechney	Quaking aspen-----5	Black cherry-----3	Hawthorn spp.-----2	Brackenfern-----5	Blackberry-----4
	Black oak-----3	Red maple-----3	Serviceberry-----1		Velvetleaf
	Red pine-----3	Quaking aspen-----1			huckleberry-----3
	E. white pine-----2	Black oak-----1			Lowbush blueberry---3
	Black cherry-----1				Starflower-----3
	Red maple-----1				Wintergreen-----3
	Jack pine-----1				Bigleaf aster-----2
	Northern red oak----1				Strawberry-----2
					Bedstraw/cleavers---1
					Mint spp.-----1
					Canada mayflower---1
				Anemone-----1	
488A----- Allendale	Red maple-----4	American beech-----2	Beaked hazelnut-----3	Brackenfern-----4	Sedge spp.-----4
	Quaking aspen-----2	E. white pine-----2		Interrupted fern---1	Wintergreen-----4
	Northern red oak----3	Red pine-----2		Sensitive fern-----1	Blueberry spp.-----3
	White ash-----3	E. hophornbeam-----1			Hepatica-----3
	Paper birch-----3				Anemone-----2
	American basswood---2				Northern dewberry---2
	E. white pine-----2				Horsetail-----1
	American beech-----1				Partridgeberry-----1
	E. hophornbeam-----1				
	White oak-----1				
	Balsam fir-----1				
Red pine-----1					

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
496B----- Gerrish- Grayling	Jack pine-----6	Jack pine-----3	Serviceberry-----3	Brackenfern-----2	Lowbush blueberry---4
	Red pine-----2	Chokecherry-----2	Sand cherry-----2		Kinnikinnick-----3
	Northern red oak---1	Black cherry-----1			Blue cladonia-----3
	Bigtooth aspen-----1	Red maple-----1			Reindeer lichen-----3
	Quaking aspen-----1	Northern red oak---1			Sweetfern-----3
	Paper birch-----1	Red pine-----1			Anemone-----3
	Black oak-----1				Velvetleaf
	Black cherry-----1			huckleberry-----2	
503D, 503E---- Bamfield, sandy substratum- Millersburg- Horsehead	Sugar maple-----5	American basswood---4	Mapleleaf viburnum--2	Brackenfern-----2	Bigleaf aster-----3
	American basswood---3	White ash-----3			Sweet cicely-----2
	American beech-----3	Sugar maple-----3			Anemone-----2
	White ash-----2	Paper birch-----2			Currant/gooseberry--1
	Paper birch-----1				
	Northern red oak---1				
504B, 504D, 504E----- Coppler- Horsehead	Bigtooth aspen-----4	Bigtooth aspen-----3	Serviceberry-----2	Brackenfern-----5	Lowbush blueberry---4
	Red pine-----4	Quaking aspen-----3	Mapleleaf viburnum--2		Hawkweed-----4
	Jack pine-----4	Black cherry-----3	Beaked hazelnut----2		Wintergreen-----4
	Quaking aspen-----3	Red maple-----3	Horthern bush		Blackberry-----3
	Red maple-----3	E. white pine-----3	honeysuckle-----1		Sweetfern-----3
	Northern red oak---2	Chokecherry-----2	Witch hazel-----1		Strawberry-----3
	E. white pine-----1	Northern red oak---1	Hawthorn spp.-----1		Reindeer lichen-----3
		White oak-----1	American fly		Canada mayflower---3
		American beech-----1	honeysuckle-----1		Bigleaf aster-----2
		Red pine-----1			Velvetleaf
					huckleberry-----2
			Anemone-----2		
			Trailing arbutus---2		
			Pink lady slipper---1		
			Hepatica-----1		
			Twinflower-----1		
			Wild sarsaparilla---1		

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
506B, 506C----- Durkeelake	Quaking aspen-----4	Red maple-----3	Serviceberry-----2	Brackenfern-----4	Bigleaf aster-----3
	Red maple-----3	Balsam fir-----2	Mapleleaf viburnum--1	Staghorn clubmoss--3	Fringed polygala---3
	Balsam fir-----3	Black cherry-----2	Beaked hazelnut-----1	Ground pine-----2	Starflower-----3
	Paper birch-----2	Chokecherry-----2	Hawthorn spp.-----1		Anemone-----3
	Sugar maple-----1	American basswood---1			Velvetleaf
	American basswood---1	Northern red oak---1			huckleberry-----2
	Black cherry-----1	White oak-----1			Wintergreen-----2
	E. white pine-----1	E. white pine-----1			Strawberry-----2
	Red pine-----1				Canada mayflower---2
	White spruce-----1				Bedstraw/cleavers---1
	Northern red oak---1				Northern dewberry--1
					Blackberry-----1
					False Solomon's seal-----1
					Hepatica-----1
				Partridgeberry-----1	
				Pyrolas spp.-----1	
				Hairy Solomon's seal-----1	
				Violet spp.-----1	
				Black snakeroot----1	
				Bunchberry-----1	
				Lousewort-----1	
				Currant/gooseberry--1	
507D----- Islandlake	Sugar maple-----5	White ash-----3	---	Spinulose shield fern-----2	Trout lily-----4
	American basswood---3	E. hophornbeam-----3		Rattlesnake fern---2	Trillium-----3
	White ash-----3	American beech-----2		Brackenfern-----2	False Solomon's seal-----2
	Northern red oak---3	American basswood---1		Ground pine-----2	Bigleaf aster-----1
	American beech-----2	Sugar maple-----1			Bedstraw/cleavers---1
	Paper birch-----1	Northern red oak---1			Violet spp.-----1
	Yellow birch-----1	E. white pine-----1			Canada mayflower---1
	E. hophornbeam-----1				Wild sarsaparilla---1
	E. white pine-----1				Currant/gooseberry--1
	Black cherry-----1				Hepatica-----1
				Sedge spp.-----1	
				Hairy Solomon's seal-----1	

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
508B, 508D, 508E----- Islandlake- Blue Lake	Sugar maple-----5 American beech-----3 American basswood---3 Eastern hemlock-----2 White ash-----1 E. hophornbeam-----1 E. white pine-----1 Northern red oak----1	Sugar maple-----3 White ash-----3 American beech-----3 American basswood---3 E. hophornbeam-----2 Balsam fir-----2 E. white pine-----2 White spruce-----2 Chokecherry-----1 Black cherry-----1	Witch hazel-----2 Elderberry-----1	Brackenfern-----3 Spinulose shield fern-----2	Starflower-----3 Twinflower-----3 Canada mayflower---3 Wild sarsaparilla---3 Sweet cicely-----2 Bigleaf aster-----2 Twistedstalk-----2 Sedge spp.-----2 Hairy Solomon's seal-----1 Trillium-----1 Violet spp.-----1
509A----- Colonville- Thunderbay	Black ash-----4 American basswood---2 Balsam poplar-----2 Balsam fir-----2 N. whitecedar-----2 Black spruce-----1 American hornbeam---1	Black ash-----3 Balsam fir-----2 Balsam poplar-----2 Blue beech-----1 Black cherry-----1	Hawthorn spp.-----1 Buckthorn-----1	Cinnamon fern-----4 Ostrich fern-----3 Maidenhair fern-----2 Wood fern-----2 Sensitive fern-----2	Anemone-----3 Canada mayflower---3 Trillium-----3 Blue cohosh-----2 Solomon's seal-----2 Meadow rue-----2 Goldenrod-----2 Greenbrier-----2 Poison ivy-----2 Nettle-----2 Clematis-----2
510----- Deerheart	Balsam fir-----3 E. white pine-----3 Black ash-----2 Quaking aspen-----2 Red maple-----2 E. hophornbeam-----1 Eastern hemlock-----1 Red pine-----1	Balsam fir-----3 E. white pine-----3 Quaking aspen-----1	Redosier dogwood---2	Brackenfern-----3	Strawberry-----3 Bulrush spp.-----3 Fringed polygala---2 Cattail-----1 Goldenrod spp.-----1 Hepatica-----1 Pyrolas-----1

Table 10.--Plant Communities on Selected Soils--Continued

Map symbol and soil name	Extent of major and minor trees	Extent of seedlings	Extent of shrubs	Extent of ferns and clubmoss	Extent of ground plants
512A: Algonquin----	Quaking aspen-----3 Balsam fir-----3 Paper birch-----2 White spruce-----2 Red pine-----1 Red maple-----1	Balsam fir-----4 Northern red oak----2 White spruce-----2 Quaking aspen-----1 Black cherry-----1	Buckthorn spp.-----2 Hawthorn spp.-----1 Witch hazel-----1	Brackenfern-----1	Bigleaf aster-----3 Black snakeroot-----3 Northern dewberry---3 Hepatica-----3 Bunchberry-----2 Sphagnum moss-----2 Canada mayflower---2 Strawberry-----2 Lousewort-----2 Bedstraw/cleavers---1 Blackberry-----1 Currant/gooseberry--1 Meadow rue spp.-----1 Wild bergamot-----1 Poison ivy-----1
Springport----	Quaking aspen-----4 N. whitecedar-----3 Black ash-----2 Red maple-----2 Balsam fir-----2 American basswood---1 E. white pine-----1 Balsam poplar-----1	Balsam fir-----2	Redosier dogwood----1	---	Goldenrod spp.-----3 Sedge spp.-----2

Table 11.--Windbreaks and Environmental Plantings

(Only the soils commonly used for windbreaks and environmental plantings are listed. Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
13: Tawas-----	Common ninebark, redosier dogwood, silky dogwood	Arrowwood, nannyberry, black spruce	Northern whitecedar, green ash	---	---
Lupton-----	Common ninebark, redosier dogwood	Arrowwood, nannyberry, black spruce	Northern whitecedar, green ash	---	---
15A: Croswell-----	---	---	Jack pine, red pine	Eastern white pine	---
Au Gres-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry	White spruce-----	Jack pine, eastern white pine, green ash	---
16B: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
16C: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
16D: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
17A: Croswell-----	---	---	Jack pine, red pine	Eastern white pine	---
17B: Croswell-----	---	---	Jack pine, red pine	Eastern white pine	---
18A: Au Gres-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry	White spruce-----	Jack pine, eastern white pine, green ash	---
20B: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
20D: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
20F: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
21D: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
24A: Kinross.					
Au Gres-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry	White spruce-----	Jack pine, eastern white pine, green ash	---
26B: Cublake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
27A: Tacoda-----	Silky dogwood-----	American cranberrybush, nannyberry	White spruce-----	Eastern white pine, jack pine, green ash	---
31B: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
31C: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
31D: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
32B: Kellogg-----	American cranberrybush, silky dogwood	---	White spruce-----	Eastern white pine, red pine	---
32C: Kellogg-----	American cranberrybush, silky dogwood	---	White spruce-----	Eastern white pine, red pine	---
36B: Annalake-----	American cranberrybush, silky dogwood	Arrowwood, nannyberry	White spruce-----	Eastern white pine, red pine	---
37A: Richter-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry, northern whitecedar	White spruce-----	Eastern white pine, green ash	---
41C: McGinn-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
44B: Ossineke-----	---	American cranberrybush	White spruce-----	White ash-----	---
44C: Ossineke-----	---	---	White spruce-----	White ash-----	---
47D: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
47F: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
50B: Au Gres-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry	White spruce-----	Eastern white pine, green ash	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
50B: Kinross.					
Croswell-----	---	---	Jack pine, red pine	Eastern white pine	---
51: Tawas-----	Common ninebark, redosier dogwood, silky dogwood	Arrowwood, nannyberry, black spruce	Northern whitecedar, green ash	---	---
Leafriver.					
53B: Negwegon-----	Silky dogwood-----	Nannyberry-----	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
53C: Negwegon-----	Silky dogwood-----	Nannyberry-----	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
54A: Algonquin-----	Silky dogwood-----	American cranberrybush	White spruce-----	Green ash, eastern white pine	---
56B: Nester-----	Silky dogwood-----	Arrowwood, nannyberry	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
56C: Nester-----	Silky dogwood-----	Arrowwood, nannyberry	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
57B: Kawkawlin-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry, northern whitecedar	White spruce, eastern white pine, red pine	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
58A: Wakeley.					
Allendale-----	---	American cranberrybush, nannyberry, northern whitecedar	White spruce-----	Eastern white pine, red maple	---
67A: Bowers-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry, northern whitecedar	White spruce-----	Red pine, eastern white pine, green ash	---
Deerheart.					
71: Tawas-----	Common ninebark, redosier dogwood, silky dogwood	Arrowwood, nannyberry, black spruce	Northern whitecedar, green ash	---	---
75B: Rubicon-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
75D: Rubicon-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
81B: Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
81D: Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
81E: Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
81F: Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
90B: Chinwhisker-----	---	---	Jack pine, red pine	Eastern white pine	---
93B: Tacoda-----	Silky dogwood-----	American cranberrybush, nannyberry	White spruce-----	Eastern white pine, jack pine, green ash	---
Wakeley.					
94F: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
McGinn-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
96D2: Mongoo-----	Silky dogwood-----	Nannyberry-----	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
98C: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
110D: Mongoo-----	Silky dogwood-----	Nannyberry-----	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
110F: Mongoo-----	Silky dogwood-----	Nannyberry-----	White spruce-----	Green ash, red pine, white ash, eastern white pine	---
111B: Kellogg-----	American cranberrybush, silky dogwood	---	White spruce-----	Eastern white pine, red pine	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
111C: Kellogg-----	American cranberrybush, silky dogwood	---	White spruce-----	Eastern white pine, red pine	---
116B: Mancelona-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
116C: Mancelona-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
116D: Mancelona-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
116E: Mancelona-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
123D: Klackung-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
125B: Melita-----	---	---	Jack pine, red pine	Eastern white pine	---
144B: Perecheney-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
144C: Perecheney-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
307B: Klackung-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
307E: Klackung-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
338B: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
338E: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
352B: Deford-----	American cranberrybush, common ninebark, silky dogwood	Nannyberry, northern whitecedar	White spruce-----	Eastern white pine, green ash	---
Au Gres-----	Common ninebark-----	American cranberrybush, nannyberry	White spruce-----	Jack pine, eastern white pine, green ash	---
Croswell-----	---	---	Jack pine, red pine	Eastern white pine	---
362B: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
362D: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
362E: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
368A: Au Gres-----	Common ninebark-----	American cranberrybush, nannyberry	White spruce-----	Jack pine, eastern white pine, green ash	---
Deford-----	American cranberrybush, common ninebark, silky dogwood	Nannyberry, northern whitecedar	White spruce-----	Eastern white pine, green ash	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
369: Deford-----	American cranberrybush, common ninebark, silky dogwood	Nannyberry, northern whitecedar	White spruce-----	Eastern white pine, green ash	---
384B: Iosco-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry, northern whitecedar	White spruce-----	Eastern white pine, green ash	---
388B: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Klacking-----	Common ninebark-----	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
388D: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
388E: Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
390B: Horsehead-----	---	---	Jack pine, red pine	Eastern white pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
390D:					
Horsehead-----	---	---	Jack pine, red pine	Eastern white pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
390E:					
Horsehead-----	---	---	Jack pine, red pine	Eastern white pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
390F:					
Horsehead-----	---	---	Jack pine, red pine	Eastern white pine	---
Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
391B:					
Horsehead-----	---	---	Jack pine, red pine	Eastern white pine	---
393B:					
Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
393C:					
Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
399D:					
Menominee-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine, white ash	---
Bamfield, sandy substratum-----	---	American cranberrybush	White spruce-----	White ash-----	---
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
400F:					
Menominee-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine, white ash	---
Bamfield, sandy substratum-----	---	American cranberrybush	White spruce-----	White ash-----	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
400F: Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
424B: Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
Ossineke, sandy substratum-----	---	---	American cranberrybush	---	White spruce, white ash
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
424C: Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
Ossineke, sandy substratum-----	---	---	American cranberrybush	---	White spruce, white ash
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
426B: Coppler-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
441B: Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
Nester-----	---	Arrowwood, nannyberry	White spruce-----	Green ash, white ash, eastern white pine	Red pine
441C: Morganlake-----	American cranberrybush	Nannyberry-----	White spruce-----	Eastern white pine, white ash	---
Nester-----	---	Arrowwood, nannyberry	White spruce-----	Green ash, white ash, eastern white pine	Red pine

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
452D: Bamfield, sandy substratum-----	---	---	American cranberrybush	---	White spruce, white ash
475B: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
475D: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
475E: Graycalm-----	---	---	Jack pine, red pine	Eastern white pine	---
Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
476B: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
Perecheney-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
476D: Klacking-----	---	Nannyberry-----	White spruce-----	Eastern white pine, red pine	---
Perecheney-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
488A: Allendale-----	---	American cranberrybush, nannyberry	White spruce-----	Eastern white pine, red maple	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
496B: Gerrish-----	---	---	Jack pine, red pine	Eastern white pine	---
Grayling-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
503D: Bamfield, sandy substratum-----	---	---	American cranberrybush	---	White spruce, white ash
Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
503E: Bamfield, sandy substratum-----	---	---	American cranberrybush	---	White spruce, white ash
Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
504B: Coppler-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
504D: Coppler-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
504E: Coppler-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
504E: Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
505B: Ossineke-----	---	American cranberrybush	White spruce-----	White ash-----	---
Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
505C: Ossineke-----	---	American cranberrybush	White spruce-----	White ash-----	---
Millersburg-----	---	Arrowwood, nannyberry	White spruce-----	Red pine, eastern white pine	---
Horsehead-----	---	---	White spruce-----	Eastern white pine, jack pine, red pine	---
506B: Durkeelake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
506C: Durkeelake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
507D: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
508B: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
508D: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
508E: Islandlake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
Blue Lake-----	Buffaloberry, smooth sumac, staghorn sumac	---	Jack pine, red pine, eastern white pine	---	---
509A: Colonville-----	Staghorn sumac-----	Hawthorn, buffaloberry, nannyberry	---	Green ash-----	---
Thunderbay.					
511B: Parmalee-----	---	American cranberrybush	Nannyberry, white spruce	Eastern white pine, red pine	---
511C: Parmalee-----	---	American cranberrybush	Nannyberry, white spruce	Eastern white pine, red pine	---
512A: Algonquin-----	Silky dogwood-----	American cranberrybush	White spruce-----	Green ash, eastern white pine	---
Springport.					
513A: Bowers-----	Common ninebark, silky dogwood	American cranberrybush, nannyberry	White spruce-----	Red pine, eastern white pine, green ash	---

Table 12.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Absence of an entry indicates that the soil was not rated or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
13: Tawas-----	Very limited: depth to saturated zone, ponding.				
Lupton-----	Very limited: depth to saturated zone, ponding.				
14: Dawson-----	Very limited: depth to saturated zone, ponding.				
Loxley-----	Very limited: depth to saturated zone, ponding.				
15A: Crowell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone,	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy,	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
16B: Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
16C: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
16D: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
17A: Croswell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
17B: Croswell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
18A: Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
19: Leafriver-----	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: content of organic matter, depth to saturated zone, ponding.			
20B: Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Grayling-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
20D: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
20F:					
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Grayling-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
21D:					
Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Klackang-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: too sandy, slope.	Very limited: slope.
23:					
Ausable-----	Very limited: depth to saturated zone, flooding, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: depth to saturated zone, content of organic matter, flooding, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: flooding, content of organic matter, depth to saturated zone, ponding.
Bowstring-----	Very limited: depth to saturated zone, flooding, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: depth to saturated zone, content of organic matter, flooding, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: flooding, content of organic matter, depth to saturated zone, ponding.
24A:					
Kinross-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.			
Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
26B:					
Cublake-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
27A: Tacoda-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
31B: Klacking-----	Somewhat limited: too sandy.	Somewhat limited: too sandy.	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy.	Not limited.
31C: Klacking-----	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy, slope.	Very limited: slope.	Somewhat limited: too sandy.	Somewhat limited. slope.
31D: Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: too sandy, slope.	Very limited: slope.
32B: Kellogg-----	Very limited: too sandy, restricted permeability, depth to saturated zone.	Very limited: too sandy, restricted permeability, depth to saturated zone.	Very limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: too sandy, depth to saturated zone, droughty.
32C: Kellogg-----	Very limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, restricted permeability, depth to saturated zone.	Very limited: too sandy.	Somewhat limited: too sandy, depth to saturated zone, droughty, slope.
36B: Annalake-----	Somewhat limited: too sandy.	Somewhat limited: too sandy.	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy.	Not limited.
37A: Richter-----	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone.
41C: McGinn-----	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy, slope.	Very limited: slope.	Somewhat limited: too sandy.	Somewhat limited. slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
44B: Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
44C: Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone, restricted permeability.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
47D: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
47F: Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
50B: Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
Kinross-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.
Croswell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
51: Tawas-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
51: Leafriver-----	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: content of organic matter, depth to saturated zone, ponding.
53B: Negwegon-----	Very limited: restricted permeability, depth to saturated zone.	Very limited: restricted permeability, depth to saturated zone.	Very limited: restricted permeability, slope, depth to saturated zone.	Not limited-----	Somewhat limited: depth to saturated zone.
53C: Negwegon-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, restricted permeability, depth to saturated zone.	Not limited-----	Somewhat limited: depth to saturated zone, slope.
54A: Algonquin-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
56B: Nester-----	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Not limited-----	Somewhat limited: depth to saturated zone.
56C: Nester-----	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, restricted permeability, depth to saturated zone.	Not limited-----	Somewhat limited: depth to saturated zone, slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
57B: Kawkawlin-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability, slope.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
58A: Wakeley-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
Allendale-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, droughty.
67A: Bowers-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
Deerheart-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
70: Lupton-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
71: Tawas-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
75B: Rubicon-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
75D: Rubicon-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
78. Pits, borrow					
81B: Grayling-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
81D: Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
81E: Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope.
81F: Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope.
82B. Udorthents					
83B: Udipsamments-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
86: Histosols-----	Very limited: depth to saturated zone, ponding.				
Aquents-----	Very limited: depth to saturated zone, ponding.				

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
87: Ausable-----	Very limited: depth to saturated zone, flooding, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: depth to saturated zone, content of organic matter, flooding, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: flooding, content of organic matter, depth to saturated zone, ponding.
90B: Chinwhisker-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
93B: Tacoda-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
Wakeley-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
94F: Klacking-----	Very limited: slope.				
McGinn-----	Very limited: slope.				
96D2: Mongo-----	Very limited: restricted permeability, slope.	Very limited: restricted permeability, slope.	Very limited: slope, restricted permeability.	Very limited: water erosion.	Very limited: slope.
98C: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
110D: Mongol-----	Very limited: restricted permeability, slope.	Very limited: restricted permeability, slope.	Very limited: slope, restricted permeability.	Not limited-----	Very limited: slope.
110F: Mongol-----	Very limited: slope, restricted permeability.	Very limited: slope, restricted permeability.	Very limited: slope, restricted permeability.	Very limited: slope.	Very limited: slope.
111B: Kellogg-----	Somewhat limited: restricted permeability, too sandy, depth to saturated zone.	Somewhat limited: restricted permeability, too sandy, depth to saturated zone.	Somewhat limited: restricted permeability, too sandy, depth to saturated zone, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, droughty.
111C: Kellogg-----	Somewhat limited: restricted permeability, too sandy, depth to saturated zone, slope.	Somewhat limited: restricted permeability, too sandy, depth to saturated zone, slope.	Very limited: slope, restricted permeability, too sandy, depth to saturated zone.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, droughty, slope.
116B: Mancelona-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Somewhat limited: too sandy, droughty, content of large stones.
116C: Mancelona-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Somewhat limited: too sandy, droughty, slope, content of large stones.
116D: Mancelona-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: slope, too sandy, droughty, content of large stones.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
116E: Mancelona-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy, slope.	Very limited: slope, too sandy, droughty, content of large stones.
123D: Klackung-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
125B: Melita-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
144B: Perecheney-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
144C: Perecheney-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
200. Borrow source					
210B: Grayling-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
210C: Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
210D: Grayling-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
210E: Grayling-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy.
211B: Grayling, banded substratum-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
211C: Grayling, banded substratum-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
211D: Grayling, banded substratum-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
211E: Grayling, banded substratum-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
212B: Grayling, very deep water table-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
213B: Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
213C: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
213D: Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
214B: Oxyaquic Udipsamments-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope,	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
215B: Typic Udipsamments, loamy substratum---	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
215C: Typic Udipsamments, loamy substratum---	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
215D: Typic Udipsamments, loamy substratum---	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
220B: Typic Udipsamments--	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
220C: Typic Udipsamments--	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
220D: Typic Udipsamments--	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
220E: Typic Udipsamments--	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
221B: Typic Udipsamments, banded substratum--	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Lamellic Udipsamments-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
221C: Typic Udipsamments, banded substratum--	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Lamellic Udipsamments-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
221D: Typic Udipsamments, banded substratum--	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Lamellic Udipsamments-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
221E: Typic Udipsamments, banded substratum--	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Lamellic Udipsamments-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
222B: Typic Udipsamments, very deep water table-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
223B: Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Grayling-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
223C: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Grayling-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
223D: Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Grayling-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
223E: Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Grayling-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy.
224B: Croswell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
225B: Entic Haplorthods, sandy, loamy substratum-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
225C: Entic Haplorthods, sandy, loamy substratum-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
225D: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
225E: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy.
230C: Entic Haplorthods, sandy-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: droughty, slope.
230D: Entic Haplorthods, sandy-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
230E: Entic Haplorthods, sandy-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
231B: Lamellic Haplorthods, sandy	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
231C: Lamellic Haplorthods, sandy	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Alfic Haplorthods, sandy-----	Somewhat limited: slope, too sandy.	Somewhat limited: slope, too sandy	Very limited: slope.	Not limited-----	Somewhat limited: droughty, slope.
231D: Lamellic Haplorthods, sandy	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
231E: Lamellic Haplorthods, sandy	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
232B: Entic Haplorthods, sandy, very deep water table-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Alfic Haplorthods, sandy, very deep water table-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
232D: Entic Haplorthods, sandy, very deep water table-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
Alfic Haplorthods, sandy, very deep water table-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
233B: Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
233C: Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: droughty, slope.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
233D: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
233E: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy.
234B: Lamellic Oxyaquic Haplorthods, sandy	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
235B: Alfic Haplorthods, sandy over loamy---	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.
Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.
235C: Alfic Haplorthods, sandy over loamy---	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: slope, droughty.
Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: droughty, slope.
235D: Alfic Haplorthods, sandy over loamy---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
235E: Alfic Haplorthods, sandy over loamy---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
236B: Arenic Hapludalfs---	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Somewhat limited: droughty.
236C: Arenic Hapludalfs---	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: slope, droughty.
236D: Arenic Hapludalfs---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope, droughty.
236E: Arenic Hapludalfs---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, droughty.
237B: Glossudalfs, loamy--	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Not limited.
237C: Glossudalfs, loamy--	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Not limited-----	Somewhat limited: slope.
237D: Glossudalfs, loamy--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: slope.
237E: Glossudalfs, loamy--	Very limited: slope.				

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
247B: Glennie-----	Somewhat limited: depth to saturated zone, restricted permeability.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
247C: Glennie-----	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone, restricted permeability.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone, restricted permeability.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
250D: Glossudalfs-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Not limited-----	Very limited: slope.
Haplosaprists, euic	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
252A: Haplosaprists, euic	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
254A: Haplosaprists, euic	Very limited: depth to saturated zone, flooding, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, flooding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, flooding.
Fluvaquents-----	Very limited: depth to saturated zone, flooding, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: depth to saturated zone, content of organic matter, flooding, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: flooding, content of organic matter, depth to saturated zone, ponding.
Aquic Udipsamments--	Very limited: depth to saturated zone, flooding, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy, flooding.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, flooding, droughty, too sandy.
262A: Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
264A: Allendale-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, droughty.
265B: Glossudalfs-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Not limited.
Allendale-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, droughty.
272: Endoaquods-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.			

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
272: Fluvaquents, occasionally flooded-----	Very limited: depth to saturated zone, flooding, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: depth to saturated zone, content of organic matter, flooding, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, flooding.	Very limited: flooding, content of organic matter, depth to saturated zone, ponding.
273: Leafriver-----	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: content of organic matter, depth to saturated zone, ponding.			
Wakeley-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
274: Typic Endoaquods, wet-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.			
280: Aquents-----	Very limited: depth to saturated zone, ponding.	Very limited: ponding, depth to saturated zone.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: ponding, depth to saturated zone.
Histosols-----	Very limited: depth to saturated zone, ponding.	Very limited: ponding, depth to saturated zone.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: ponding, depth to saturated zone.
281: Haplosaprists, dysic	Very limited: depth to saturated zone, ponding.				
282: Haplosaprists, euic	Very limited: depth to saturated zone, ponding.				

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
307B: Klacking-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
307E: Klacking-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
338B: Islandlake-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
338E: Islandlake-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.
352B: Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.
Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
Croswell-----	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone.	Very limited: too sandy, depth to saturated zone, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy, depth to saturated zone.
360: Wakeley-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
362B: Millersburg-----	Somewhat limited: too sandy.	Somewhat limited: too sandy.	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy.	Not limited.
362D: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: too sandy, slope.	Somewhat limited: slope.
362E: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited slope.
368A: Au Gres-----	Very limited: depth to saturated zone, too sandy.	Very limited: too sandy, depth to saturated zone.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, droughty, too sandy.
Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.
369: Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, droughty.
371: Springport-----	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
380. Access denied					

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
384B: Iosco-----	Very limited: depth to saturated zone, too sandy, restricted permeability.	Very limited: too sandy, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, too sandy, restricted permeability, slope.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone, too sandy.
388B: Millersburg-----	Somewhat limited: too sandy.	Somewhat limited: too sandy.	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy.	Not limited.
Klackings-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
388D: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: too sandy, slope.	Somewhat limited: slope.
Klackings-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
388E: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.
Klackings-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
390B: Horsehead-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.
Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
390D: Horsehead-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: droughty, slope, too sandy, content of large stones.
Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
390E: Horsehead-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy, content of large stones.
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
390F: Horsehead-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: slope, too sandy.	Very limited: slope, droughty, too sandy, content of large stones.
Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
391B: Horsehead-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
393B: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone.
393C: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, slope.
399D: Menominee-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Very limited: slope, too sandy.
Bamfield, sandy substratum-----	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Somewhat limited: too sandy.	Very limited: slope.
Blue Lake-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
400F: Menominee-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy.
Bamfield, sandy substratum-----	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, too sandy.	Very limited: slope.
Blue Lake-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
424B: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone.
Ossineke, sandy substratum-----	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
Blue Lake-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
424C: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, slope.
Ossineke, sandy substratum-----	Somewhat limited: depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
Blue Lake-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
426B: Coppler-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
441B: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone.
Nester-----	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: restricted permeability, slope, depth to saturated zone.	Not limited-----	Somewhat limited: depth to saturated zone.
441C: Morganlake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, slope.
Nester-----	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, restricted permeability, depth to saturated zone.	Not limited-----	Somewhat limited: depth to saturated zone, slope.
452D: Bamfield, sandy substratum-----	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Very limited: slope, restricted permeability, too sandy.	Somewhat limited: too sandy.	Very limited: slope.
475B: Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
Klacking-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
475D: Graycalm-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Klackings-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
475E: Graycalm-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
Klackings-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
476B: Klackings-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
Perecheney-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone.
476D: Klackings-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Perecheney-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
488A: Allendale-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, droughty.
496B: Gerrish-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
Graycalm-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Somewhat limited: droughty, too sandy.
503D: Bamfield, sandy substratum-----	Very limited: restricted permeability, slope, too sandy.	Very limited: restricted permeability, slope, too sandy.	Very limited: slope, restricted permeability, too sandy.	Somewhat limited: too sandy.	Somewhat limited: slope.
Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Somewhat limited: too sandy, slope.	Somewhat limited: slope.
Horsehead-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: droughty, slope, too sandy, content of large stones.
504B: Coppler-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.
Horsehead-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.
504D: Coppler-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: droughty, slope, too sandy, content of large stones.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
504D: Horsehead-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: droughty, slope, too sandy, content of large stones.
504E: Coppler-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy, content of large stones.
Horsehead-----	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy, content of large stones.
505B: Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
Millersburg-----	Somewhat limited: too sandy.	Somewhat limited: too sandy.	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy.	Not limited.
Horsehead-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, content of large stones.
505C: Ossineke-----	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone, restricted permeability.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
Millersburg-----	Somewhat limited: too sandy, slope.	Somewhat limited: too sandy, slope.	Very limited: slope.	Somewhat limited: too sandy.	Somewhat limited. slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
505C: Horsehead-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy, content of large stones.	Very limited: too sandy.	Very limited: droughty, too sandy, slope, content of large stones.
506B: Durkeelake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone.
506C: Durkeelake-----	Somewhat limited: too sandy, depth to saturated zone, restricted permeability, slope.	Somewhat limited: too sandy, restricted permeability, depth to saturated zone, slope.	Very limited: slope, too sandy, depth to saturated zone, restricted permeability.	Somewhat limited: too sandy.	Somewhat limited: depth to saturated zone, slope.
507D: Islandlake-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
508B: Islandlake-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
Blue Lake-----	Very limited: too sandy.	Very limited: too sandy.	Very limited: too sandy, slope.	Very limited: too sandy.	Very limited: droughty, too sandy.
508D: Islandlake-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.
Blue Lake-----	Very limited: too sandy, slope.	Very limited: too sandy, slope.	Very limited: slope, too sandy.	Very limited: too sandy.	Somewhat limited: droughty, slope, too sandy.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
508E: Islandlake-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
Blue Lake-----	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: slope, too sandy.	Very limited: too sandy, slope.	Very limited: slope, droughty, too sandy.
509A: Colonville-----	Very limited: depth to saturated zone, flooding.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, flooding.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, flooding.
Thunderbay-----	Very limited: depth to saturated zone, flooding, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, flooding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, flooding.
510: Deerheart-----	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding, restricted permeability.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
511B: Parmalee-----	Somewhat limited: depth to saturated zone, restricted permeability.	Somewhat limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
511C: Parmalee-----	Somewhat limited: depth to saturated zone, restricted permeability, slope.	Somewhat limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone, restricted permeability.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.
512A: Algonquin-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Lawns, landscaping, and golf fairways
512A: Springport-----	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, restricted permeability, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.
513A: Bowers-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.

Table 13.--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
13: Tawas-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Lupton-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
14: Dawson-----	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.
15A: Crowell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
16B: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
16C: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
16D: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
17A: Crowell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
17B: Crowell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
18A: Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
19: Leafriver-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
20B: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
20D: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

Table 13.--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
20F:										
Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
21D:										
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Klacking-----	Poor	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
23:										
Ausable-----	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
Bowstring-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
24A:										
Kinross-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
26B:										
Cublake-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
27A:										
Tacoda-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
31B:										
Klacking-----	Poor	Fair	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
31C:										
Klacking-----	Poor	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
31D:										
Klacking-----	Poor	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
32B:										
Kellogg-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
32C:										
Kellogg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
36B:										
Annalake-----	Poor	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Poor.
37A:										
Richter-----	Fair	Good	Good	Fair	Good	Fair	Fair	Good	Fair	Fair.
41C:										
McGinn-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 13.--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
44B: Ossineke-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
44C: Ossineke-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
47D: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
47F: Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
50B: Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
Kinross-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Croswell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
51: Tawas-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Leafriver-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
53B: Negwegon-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
53C: Negwegon-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
54A: Algonquin-----	Fair	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
56B: Nester-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
56C: Nester-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
57B: Kawkawlin-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
58A: Wakeley-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Poor.
Allendale-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.

Table 13.--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
67A: Bowers-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Deerheart-----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
70: Lupton-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
71: Tawas-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
75B: Rubicon-----	Poor	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
75D: Rubicon-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
78. Pits, borrow										
81B: Grayling-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
81D: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
81E: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
81F: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
82B. Udorthents										
83B. Udipsamments										
86: Histosols-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Aquents.										
87: Ausable-----	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
90B: Chinwhisker-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.

Table 13.--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
93B:										
Tacoda-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
Wakeley-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.
94F:										
Klacking-----	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
McGinn-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
96D2:										
Mongo-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
98C:										
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
110D:										
Mongo-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
110F:										
Mongo-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
111B:										
Kellogg-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
111C:										
Kellogg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
116B:										
Mancelona-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
116C:										
Mancelona-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
116D:										
Mancelona-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
116E:										
Mancelona-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
123D:										
Klacking-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
125B:										
Melita-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
144B: Perecheney-----	Poor	Poor	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
144C: Perecheney-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
200. Borrow source										
210B: Grayling-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
210C: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
210D: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
210E: Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
211B: Grayling, banded substratum-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
211C: Grayling, banded substratum-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
211D: Grayling, banded substratum-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Graycalm-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
211E: Grayling, banded substratum-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
212B: Grayling, very deep water table	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
213B: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
213C: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
213D: Graycalm-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
214B: Oxyaquic Udipsamments-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
215B: Typic Udipsamments, loamy substratum	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
215C: Typic Udipsamments, loamy substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
215D: Typic Udipsamments, loamy substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220B: Typic Udipsamments	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220C: Typic Udipsamments	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220D: Typic Udipsamments	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
220E: Typic Udipsamments	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
221B: Typic Udipsamments, banded substratum	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

Table 13.--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
221B: Lamellic Udipsamments-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
221C: Typic Udipsamments, banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Lamellic Udipsamments-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
221D: Typic Udipsamments, banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Lamellic Udipsamments-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
221E: Typic Udipsamments, banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Lamellic Udipsamments-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
222B: Typic Udipsamments, very deep water table-----	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
223B: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
223C: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
223D: Graycalm-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

Table 13.--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
223E: Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
224B: Croswell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
225B: Entic Haplorthods, sandy, loamy substratum-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
225C: Entic Haplorthods, sandy, loamy substratum-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
225D: Entic Haplorthods, sandy, loamy substratum-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
225E: Entic Haplorthods, sandy, loamy substratum-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.
230C: Entic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
230D: Entic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
230E: Entic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
231B: Lamellic Haplorthods, sandy-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
231C: Lamellic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
231D: Lamellic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
231E: Lamellic Haplorthods, sandy-----	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Alfic Haplorthods, sandy-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
232B: Entic Haplorthods, sandy, very deep water table-----	Poor	Poor	Good	Good	Good	Poor	Poor	Poor	Good	Poor.
Alfic Haplorthods, sandy, very deep water table-----	Poor	Poor	Good	Good	Good	Poor	Poor	Fair	Fair	Poor.
232D: Entic Haplorthods, sandy, very deep water table-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Very poor.	Fair	Very poor.
Alfic Haplorthods, sandy, very deep water table-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
233B: Alfic Haplorthods, sandy-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Entic Haplorthods, sandy, fine-loamy banded substratum	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
233C: Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Entic Haplorthods, sandy, fine-loamy banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
233D: Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Entic Haplorthods, sandy, fine-loamy banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
233E: Alfic Haplorthods, sandy-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Entic Haplorthods, sandy, fine-loamy banded substratum	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
234B: Lamellic Oxyaquic Haplorthods, sandy-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
235B: Alfic Haplorthods, sandy over loamy	Poor	Poor	Good	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
235C: Alfic Haplorthods, sandy over loamy	Poor	Poor	Good	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
235D: Alfic Haplorthods, sandy over loamy	Poor	Poor	Good	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.
Alfic Haplorthods, sandy-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
235E: Alfic Haplorthods, sandy over loamy	Very poor.	Very poor.	Good	Fair	Good	Poor	Very poor.	Poor	Fair	Very poor.
Alfic Haplorthods, sandy-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
236B: Arenic Hapludalfs	Poor	Fair	Good	Fair	Good	Poor	Poor	Fair	Fair	Very poor.
236C: Arenic Hapludalfs	Poor	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
236D: Arenic Hapludalfs	Poor	Fair	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
236E: Arenic Hapludalfs	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
237B: Glossudalfs, loamy	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
237C: Glossudalfs, loamy	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
237D: Glossudalfs, loamy	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
237E: Glossudalfs, loamy	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
247B: Glennie-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ossineke-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
247C: Glennie-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ossineke-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--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
250D: Glossudalfs-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Haplosaprist, euc-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
252A: Haplosaprist, euc-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
254A: Haplosaprist, euc-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Fluvaquents-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Aquic Udipsamments	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Good	Poor.
262A: Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
264A: Allendale-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
265B: Glossudalfs-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Allendale-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
272: Endoaquods-----	Very poor.	Poor	Fair	Poor	Poor	Fair	Good	Poor	Poor	Good.
Fluvaquents, occasionally flooded-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
273: Leafriver-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wakeley-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Poor.
274: Typic Endoaquods, wet-----	Very poor.	Very poor.	Poor	Fair	Fair	Good	Good	Poor	Poor	Good.
280: Aquents.										
Histosols-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

Table 13.--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
281: Haplosaprists, dysic-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
282: Haplosaprists, euc-----	Very poor.	Very poor.	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
307B: Klacking-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
307E: Klacking-----	Very poor.	Poor	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
338B: Islandlake-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
338E: Islandlake-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
352B: Deford-----	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Good.
Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
Croswell-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
360: Wakeley-----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Poor.
362B: Millersburg-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
362D: Millersburg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
362E: Millersburg-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
368A: Au Gres-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.
Deford-----	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Good.
369: Deford-----	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Good.

Table 13.--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
371: Springport-----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
380. Access denied										
384B: Iosco-----	Poor	Poor	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
388B: Millersburg-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Klacking-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
388D: Millersburg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Klacking-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
388E: Millersburg-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Klacking-----	Very poor.	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Graycalm-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
390B: Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
390D: Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
390E: Horsehead-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
390F:										
Horsehead-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
391B:										
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
393B:										
Morganlake-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
393C:										
Morganlake-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
399D:										
Menominee-----	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bamfield, sandy substratum-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Blue Lake-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
400F:										
Menominee-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Bamfield, sandy substratum-----	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
Blue Lake-----	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
424B:										
Morganlake-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Ossineke, sandy substratum-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Blue Lake-----	Poor	Poor	Good	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.
424C:										
Morganlake-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ossineke, sandy substratum-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Blue Lake-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.

Table 13.--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
426B: Copples-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
441B: Morganlake-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Nester-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
441C: Morganlake-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Nester-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
452D: Bamfield, sandy substratum-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
475B: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Klacking-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
475D: Graycalm-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Klacking-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
475E: Graycalm-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Klacking-----	Very poor.	Poor	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
476B: Klacking-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Fair	Poor.
Perecheney-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
476D: Klacking-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Perecheney-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
488A: Allendale-----	Poor	Poor	Good	Fair	Good	Poor	Fair	Fair	Fair	Poor.

Table 13.--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
496B:										
Gerrish-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Grayling-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
503D:										
Bamfield, sandy substratum-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Millersburg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
503E:										
Bamfield, sandy substratum-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Millersburg-----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Horsehead-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
504B:										
Coppler-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
504D:										
Coppler-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
504E:										
Coppler-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Horsehead-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
505B:										
Ossineke-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Millersburg-----	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 13.--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
505C: Ossineke-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Millersburg-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Horsehead-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
506B: Durkeelake-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Good	Poor.
506C: Durkeelake-----	Poor	Poor	Good	Fair	Good	Poor	Poor	Fair	Good	Poor.
507D: Islandlake-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
508B: Islandlake-----	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Blue Lake-----	Poor	Poor	Good	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.
508D: Islandlake-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Blue Lake-----	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
508E: Islandlake-----	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Blue Lake-----	Very poor.	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
509A: Colonville-----	Fair	Poor	Good	Good	Good	Fair	Fair	Fair	Fair	Fair.
Thunderbay-----	Very poor.	Very poor.	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
510: Deerheart-----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
511B: Parmalee-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
511C: Parmalee-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--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
512A: Algonquin-----	Fair	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair.
Springport-----	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
513A: Bowers-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

Table 14.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for further explanation of ratings in this table)

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
13: Tawas-----	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: depth to saturated zone, subsidence, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
Lupton-----	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, frost action, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, cutbanks cave.
14: Dawson-----	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, frost action, subsidence, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
Loxley-----	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, frost action, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, cutbanks cave.
15A: Crowell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
16B: Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
16C: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
16D: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
17A: Crowell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
17B: Crowell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
18A: Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
19: Leafriver-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding.
20B: Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Grayling-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
20D: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
20D: Grayling-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
20F: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
21D: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Klackung-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
23: Ausable-----	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: depth to saturated zone, flooding, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, flooding.
Bowstring-----	Very limited: subsidence, flooding, depth to saturated zone, content of organic matter, ponding.	Very limited: subsidence, flooding, depth to saturated zone, ponding.	Very limited: subsidence, flooding, depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, subsidence, frost action, flooding, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter, flooding.
24A: Kinross-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
24A: Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
26B: Cublake-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
27A: Tacoda-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.
31B: Klacking-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
31C: Klacking-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
31D: Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
32B: Kellogg-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
32C: Kellogg-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
36B: Annalake-----	Not limited-----	Very limited: depth to saturated zone.	Not limited-----	Somewhat limited: frost action.	Very limited: cutbanks cave, depth to saturated zone.
37A: Richter-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
41C: McGinn-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: frost action, slope.	Very limited: cutbanks cave, slope.
44B: Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave.
44C: Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action, slope.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave, slope.
47D: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
47F: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
50B:					
Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
Kinross-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding.
Croswell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
51:					
Tawas-----	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: depth to saturated zone, subsidence, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
Leafriver-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding.
53B:					
Negwegon-----	Very limited: shrink-swell, depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: shrink-swell, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
53C:					
Negwegon-----	Very limited: shrink-swell, depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: shrink-swell, slope, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
54A: Algonquin-----	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, shrink-swell.	Very limited: depth to saturated zone.
56B: Nester-----	Somewhat limited: shrink-swell, depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: shrink-swell, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
56C: Nester-----	Somewhat limited: shrink-swell, depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, shrink-swell, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey, slope.
57B: Kawkawlin-----	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, shrink-swell.	Very limited: depth to saturated zone.
58A: Wakeley-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, too clayey.
Allendale-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
67A: Bowers-----	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, shrink-swell.	Very limited: depth to saturated zone, cutbanks cave.
Deerheart-----	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, cutbanks cave.
70: Lupton-----	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, subsidence, ponding.	Very limited: depth to saturated zone, frost action, subsidence, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, cutbanks cave.
71: Tawas-----	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: subsidence, depth to saturated zone, ponding.	Very limited: depth to saturated zone, subsidence, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
75B: Rubicon-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
75D: Rubicon-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
78: Pits, borrow-----	Not rated-----	Not rated-----	Not rated-----	Not rated-----	Not rated.
81B: Grayling-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
81D: Grayling-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
81E: Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
81F: Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
82B: Udorthents-----	Not rated-----	Not rated-----	Not rated-----	Not rated-----	Not rated.
83B: Udipsamments-----	Not rated-----	Not rated-----	Not rated-----	Not rated-----	Very limited: cutbanks cave.
86: Histosols-----	Very limited: ponding, depth to saturated zone, content of organic matter, subsidence.	Very limited: ponding, depth to saturated zone, content of organic matter, subsidence.	Very limited: ponding, depth to saturated zone, content of organic matter, subsidence.	Very limited: ponding, depth to saturated zone, frost action, subsidence.	Very limited: ponding, depth to saturated zone, content of organic matter, cutbanks cave.
Aquents-----	Very limited: ponding, depth to saturated zone, content of org.nic	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone, frost action.	Very limited: ponding, depth to saturated zone.
87: Ausable-----	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: depth to saturated zone, flooding, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, flooding.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
90B: Chinwhisker-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
93B: Tacoda-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.
Wakeley-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, too clayey.
94F: Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
McGinn-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: cutbanks cave, slope.
96D2: Mongo-----	Very limited: shrink-swell, slope.	Very limited: shrink-swell, slope.	Very limited: slope, shrink-swell.	Very limited: shrink-swell, slope, frost action.	Very limited: slope, too clayey, cutbanks cave.
98C: Graycalm-----	Not limited-----	Not limited-----	Somewhat limited: slope.	Not limited-----	Very limited: cutbanks cave.
110D: Mongo-----	Very limited: shrink-swell, slope.	Very limited: shrink-swell, slope.	Very limited: slope, shrink-swell.	Very limited: low strength, shrink-swell, slope, frost action.	Very limited: slope, too clayey.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
110F: Mongo-----	Very limited: slope, shrink-swell.	Very limited: slope, shrink-swell.	Very limited: slope, shrink-swell.	Very limited: slope, low strength, shrink-swell, frost action.	Very limited: slope, too clayey.
111B: Kellogg-----	Very limited: shrink-swell, depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: shrink-swell, depth to saturated zone.	Very limited: shrink-swell, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, too clayey.
111C: Kellogg-----	Very limited: shrink-swell, depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: shrink-swell, slope, depth to saturated zone.	Very limited: shrink-swell, depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, too clayey, slope.
116B: Mancelona-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
116C: Mancelona-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
116D: Mancelona-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
116E: Mancelona-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
123D: Klackung-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
125B: Melita-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
144B: Perecheney-----	Not limited-----	Very limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave, depth to saturated zone.
144C: Perecheney-----	Somewhat limited: slope.	Very limited: depth to saturated zone, slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, depth to saturated zone, slope.
200: Borrow source-----	Not rated-----	Not rated-----	Not rated-----	Not rated-----	Not rated.
210B: Grayling-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
210C: Grayling-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
210D: Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
210E: Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
211B: Grayling, banded substratum-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
211C: Grayling, banded substratum-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
211D: Grayling, banded substratum-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
211E: Grayling, banded substratum-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
212B: Grayling, very deep water table-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave.
213B: Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
213C: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
213D: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
214B: Oxyaquic Udipsamments-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave, depth to saturated zone.
215B: Typic Udipsamments, loamy substratum---	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
215C: Typic Udipsamments, loamy substratum---	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
215D: Typic Udipsamments, loamy substratum---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
220B: Typic Udipsamments--	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
220C: Typic Udipsamments--	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
220D: Typic Udipsamments--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
220E: Typic Udipsamments--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
221B: Typic Udipsamments, banded substratum--	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Lamellic Udipsamments-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
221C: Typic Udipsamments, banded substratum--	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Lamellic Udipsamments-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
221D: Typic Udipsamments, banded substratum--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Lamellic Udipsamments-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
221E: Typic Udipsamments, banded substratum--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Lamellic Udipsamments-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
222B: Typic Udipsamments, very deep water table-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave.
223B: Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Grayling-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
223C: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Grayling-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
223D: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
223E: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
224B: Crowell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
225B: Entic Haplorthods, sandy, loamy substratum-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
225C: Entic Haplorthods, sandy, loamy substratum-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
225D: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
225E: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
230C: Entic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
230D: Entic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
230D: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
230E: Entic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
231B: Lamellic Haplorthods, sandy	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
231C: Lamellic Haplorthods, sandy	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
231D: Lamellic Haplorthods, sandy	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
231D: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
231E: Lamellic Haplorthods, sandy	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
232B: Entic Haplorthods, sandy, very deep water table-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Alfic Haplorthods, sandy, very deep water table-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave.
232D: Entic Haplorthods, sandy, very deep water table-----	Very limited: slope.	Very limited: slope, depth to saturated zone.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy, very deep water table-----	Very limited: slope.	Very limited: slope, depth to saturated zone.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
233B: Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
233C: Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
233D: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
233E: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
234B: Lamellic Oxyaquic Haplorthods, sandy	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
235B: Alfic Haplorthods, sandy over loamy---	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Alfic Haplorthods, sandy-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
235C: Alfic Haplorthods, sandy over loamy---	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
235D: Alfic Haplorthods, sandy over loamy---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
235E: Alfic Haplorthods, sandy over loamy---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
235E: Alfic Haplorthods, sandy-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
236B: Arenic Hapludalfs---	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
236C: Arenic Hapludalfs---	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
236D: Arenic Hapludalfs---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
236E: Arenic Hapludalfs---	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
237B: Glossudalfs, loamy--	Not limited-----	Not limited-----	Not limited-----	Somewhat limited: frost action.	Very limited: cutbanks cave.
237C: Glossudalfs, loamy--	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope, frost action.	Very limited: cutbanks cave, slope.
237D: Glossudalfs, loamy--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: slope, cutbanks cave.
237E: Glossudalfs, loamy--	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
247B: Glennie-----	Not limited-----	Somewhat limited: depth to saturated zone.	Not limited-----	Somewhat limited: frost action.	Very limited: cutbanks cave, depth to saturated zone, depth to dense layer.
Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave.
247C: Glennie-----	Somewhat limited: slope.	Somewhat limited: depth to saturated zone, slope.	Very limited: slope.	Somewhat limited: frost action, slope.	Very limited: cutbanks cave, depth to saturated zone, depth to dense layer, slope.
Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action, slope.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave, slope.
250D: Glossudalfs-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: cutbanks cave, slope.
Haplosaprists, euic	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
252A: Haplosaprists, euic	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
254A: Haplosaprists, euic	Very limited: flooding, depth to saturated zone, content of organic matter, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, frost action, flooding, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter, flooding.
Fluvaquents-----	Very limited: ponding, flooding, depth to saturated zone.	Very limited: ponding, flooding, depth to saturated zone.	Very limited: ponding, flooding, depth to saturated zone.	Very limited: ponding, depth to saturated zone, flooding.	Very limited: ponding, depth to saturated zone, cutbanks cave, flooding.
Aquic Udipsamments--	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: depth to saturated zone, flooding, frost action.	Very limited: depth to saturated zone, cutbanks cave, flooding.
262A: Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
264A: Allendale-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
265B: Glossudalfs-----	Not limited-----	Not limited-----	Not limited-----	Somewhat limited: frost action.	Very limited: cutbanks cave.
Allendale-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.
272: Endoaquods-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding.
Fluvaquents, occasionally flooded-----	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: depth to saturated zone, flooding.	Very limited: depth to saturated zone, cutbanks cave, flooding.
273: Leafriver-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding.
Wakeley-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, too clayey.
274: Typic Endoaquods, wet-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding.
280: Aquents-----	Very limited: ponding, depth to saturated zone, content of org.nic	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone, frost action.	Very limited: ponding, depth to saturated zone.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
280: Histosols-----	Very limited: ponding, depth to saturated zone, content of organic matter, subsidence.	Very limited: ponding, depth to saturated zone, subsidence.	Very limited: ponding, depth to saturated zone, content of organic matter, subsidence.	Very limited: ponding, depth to saturated zone, frost action, subsidence.	Very limited: ponding, depth to saturated zone, cutbanks cave, content of organic matter.
281: Haplosaprists, dysic-----	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, cutbanks cave.
282: Haplosaprists, euic	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding.	Very limited: depth to saturated zone, frost action, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter.
307B: Klacking-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
307E: Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
338B: Islandlake-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
338E: Islandlake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
352B: Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding.
Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
Croswell-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks
360: Wakeley-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, shrink- swell, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding, too clayey.
362B: Millersburg-----	Not limited-----	Not limited-----	Not limited-----	Somewhat limited: frost action.	Somewhat limited: cutbanks cave.
362D: Millersburg-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope, frost action.	Somewhat limited: slope, cutbanks cave.
362E: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: slope, cutbanks cave.
368A: Au Gres-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
369: Deford-----	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, frost action.	Very limited: depth to saturated zone, cutbanks cave, ponding.
371: Springport-----	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, shrink-swell, ponding.	Very limited: depth to saturated zone, frost action, low strength, shrink-swell, ponding.	Very limited: depth to saturated zone, ponding.
380: Access denied-----	Not rated-----	Not rated-----	Not rated-----	Not rated-----	Not rated.
384B: Iosco-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave.
388B: Millersburg-----	Not limited-----	Not limited-----	Not limited-----	Somewhat limited: frost action.	Somewhat limited: cutbanks cave.
Klacking-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
388D: Millersburg-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope, frost action.	Somewhat limited: slope, cutbanks cave.
Klacking-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
388E: Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: slope, cutbanks cave.
Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
390B: Horsehead-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
390D: Horsehead-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
390E: Horsehead-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
390F: Horsehead-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
391B: Horsehead-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
393B: Morganlake-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink- swell.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
393C: Morganlake-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink- swell, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.
399D: Menominee-----	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: cutbanks cave, slope.
Bamfield, sandy substratum-----	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, low strength, shrink- swell, frost action.	Very limited: slope, depth to dense layer, cutbanks cave.
Blue Lake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
400F: Menominee-----	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, cutbanks cave.
Bamfield, sandy substratum-----	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, low strength, shrink- swell, frost action.	Very limited: slope, depth to dense layer, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
400F: Blue Lake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
424B: Morganlake-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Ossineke, sandy substratum-----	Somewhat limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell.	Somewhat limited: low strength, depth to saturated zone, shrink-swell, frost action.	Very limited: depth to saturated zone, cutbanks cave.
Blue Lake-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
424C: Morganlake-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.
Ossineke, sandy substratum-----	Somewhat limited: depth to saturated zone, shrink-swell, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone, shrink-swell.	Somewhat limited: low strength, depth to saturated zone, shrink-swell, frost action, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.
Blue Lake-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
426B: Coppler-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
441B: Morganlake-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Nester-----	Somewhat limited: shrink-swell, depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: shrink-swell, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
441C: Morganlake-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.
Nester-----	Somewhat limited: shrink-swell, depth to saturated zone, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, shrink-swell, depth to saturated zone.	Very limited: low strength, shrink-swell, frost action, depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey, slope.
452D: Bamfield, sandy substratum-----	Very limited: slope, shrink-swell.	Very limited: slope, shrink-swell.	Very limited: slope, shrink-swell.	Very limited: slope, low strength, shrink-swell, frost action.	Very limited: slope, depth to dense layer, cutbanks cave.
475B: Graycalm-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Klacking-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
475D: Graycalm-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
475D: Klacking-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
475E: Graycalm-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Klacking-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
476B: Klacking-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Perecheney-----	Not limited-----	Very limited: depth to saturated zone.	Not limited-----	Not limited-----	Very limited: cutbanks cave, depth to saturated zone.
476D: Klacking-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
Perecheney-----	Somewhat limited: slope.	Very limited: depth to saturated zone, slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, depth to saturated zone, slope.
488A: Allendale-----	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, frost action.	Very limited: depth to saturated zone, cutbanks cave, too clayey.
496B: Gerrish-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Grayling-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
503D: Bamfield, sandy substratum-----	Somewhat limited: slope, shrink- swell.	Somewhat limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: low strength, slope, shrink- swell, frost action.	Somewhat limited: slope, depth to dense layer, cutbanks cave.
Millersburg-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope, frost action.	Somewhat limited: slope, cutbanks cave.
Horsehead-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
503E: Bamfield, sandy substratum-----	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, shrink- swell.	Very limited: slope, low strength, shrink- swell, frost action.	Very limited: slope, depth to dense layer, cutbanks cave.
Millersburg-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, frost action.	Very limited: slope, cutbanks cave.
Horsehead-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
504B: Coppler-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Horsehead-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
504D: Coppler-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
504D: Horsehead-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.
504E: Coppler-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Horsehead-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
505B: Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave.
Millersburg-----	Not limited-----	Not limited-----	Not limited-----	Somewhat limited: frost action.	Somewhat limited: cutbanks cave.
Horsehead-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
505C: Ossineke-----	Somewhat limited: depth to saturated zone, shrink-swell, slope.	Very limited: depth to saturated zone, shrink-swell, slope.	Very limited: slope, depth to saturated zone, shrink-swell.	Somewhat limited: depth to saturated zone, shrink-swell, frost action, slope.	Very limited: depth to saturated zone, depth to dense layer, cutbanks cave, slope.
Millersburg-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: frost action, slope.	Somewhat limited: cutbanks cave, slope.
Horsehead-----	Somewhat limited: slope.	Somewhat limited: slope.	Very limited: slope.	Somewhat limited: slope.	Very limited: cutbanks cave, slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
506B: Durkeelake-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
506C: Durkeelake-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave, slope.
507D: Islandlake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
508B: Islandlake-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
Blue Lake-----	Not limited-----	Not limited-----	Not limited-----	Not limited-----	Very limited: cutbanks cave.
508D: Islandlake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
Blue Lake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: cutbanks cave, slope.
508E: Islandlake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.
Blue Lake-----	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope.	Very limited: slope, cutbanks cave.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
509A: Colonville-----	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone.	Very limited: depth to saturated zone, frost action, flooding.	Very limited: depth to saturated zone, cutbanks cave, flooding.
Thunderbay-----	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: flooding, depth to saturated zone, ponding.	Very limited: depth to saturated zone, frost action, flooding, ponding.	Very limited: depth to saturated zone, cutbanks cave, ponding, content of organic matter, flooding.
510: Deerheart-----	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, ponding, shrink-swell.	Very limited: depth to saturated zone, ponding, cutbanks cave.
511B: Parmalee-----	Somewhat limited: depth to saturated zone.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Very limited: frost action, low strength, depth to saturated zone.	Very limited: depth to saturated zone.
511C: Parmalee-----	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Very limited: frost action, low strength, depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.
512A: Algonquin-----	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, shrink-swell.	Very limited: depth to saturated zone, frost action, low strength, shrink-swell.	Very limited: depth to saturated zone.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Shallow excavations
512A: Springport-----	Very limited: depth to saturated zone, shrink- swell, ponding.	Very limited: depth to saturated zone, shrink- swell, ponding.	Very limited: depth to saturated zone, shrink- swell, ponding.	Very limited: depth to saturated zone, frost action, low strength, shrink- swell, ponding.	Very limited: depth to saturated zone, ponding.
513A: Bowers-----	Very limited: depth to saturated zone, shrink- swell.	Very limited: depth to saturated zone, shrink- swell.	Very limited: depth to saturated zone, shrink- swell.	Very limited: depth to saturated zone, frost action, low strength, shrink- swell.	Very limited: depth to saturated zone, cutbanks cave.

Table 15.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Absence of an entry indicates that the soil was not rated or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
13:					
Tawas-----	Very limited: depth to saturated zone, subsidence, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Lupton-----	Very limited: depth to saturated zone, subsidence, ponding.	Very limited: content of organic matter, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, seepage, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, seepage.
14:					
Dawson-----	Very limited: depth to saturated zone, filtering capacity, subsidence, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Loxley-----	Very limited: depth to saturated zone, subsidence, ponding.	Very limited: content of organic matter, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, seepage, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, too acid, ponding, seepage.
15A:					
Croswell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
16B:					
Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
16C: Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
16D: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
17A: Croswell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
17B: Croswell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
18A: Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
19: Leafriver-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
20B: Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Grayling-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
20D:					
Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Grayling-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
20F:					
Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
21D:					
Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Klacking-----	Somewhat limited: slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, slope, seepage.
23:					
Ausable-----	Very limited: flooding, depth to saturated zone, filtering capacity, ponding.	Very limited: flooding, seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, too sandy, ponding.	Very limited: flooding, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Bowstring-----	Very limited: flooding, depth to saturated zone, filtering capacity, subsidence, ponding.	Very limited: flooding, seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, content of organic matter, ponding.	Very limited: flooding, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
24A: Kinross-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
26B: Cublake-----	Very limited: depth to saturated zone, restricted permeability, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone.
27A: Tacoda-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.
31B: Klacking-----	Not limited-----	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.
31C: Klacking-----	Somewhat limited: slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
31D: Klacking-----	Very limited: slope.	Very limited: slope, seepage.	Very limited: too sandy, slope, seepage.	Very limited: seepage, slope.	Very limited: too sandy, slope, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
32B: Kellogg-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone, too clayey.
32C: Kellogg-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, too clayey, slope.
36B: Annalake-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: depth to saturated zone.
37A: Richter-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too sandy.
41C: McGinn-----	Somewhat limited: restricted permeability, slope.	Very limited: seepage, slope.	Somewhat limited: slope.	Very limited: seepage, slope.	Somewhat limited: slope.
44B: Ossineke-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
44C: Ossineke-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, seepage, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.
47D: Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
47F: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
50B: Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
Kinross-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Croswell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
51: Tawas-----	Very limited: depth to saturated zone, subsidence, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Leafriver-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
53B: Negwegon-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Very limited: hard to compact, depth to saturated zone, too clayey.
53C: Negwegon-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: depth to saturated zone, slope.	Very limited: hard to compact, depth to saturated zone, too clayey, slope.
54A: Algonquin-----	Very limited: restricted permeability, depth to saturated zone.	Not limited-----	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
56B: Nester-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, too clayey.
56C: Nester-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, too clayey, slope.
57B: Kawkawlin-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: slope.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
58A: Wakeley-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: seepage, ponding, content of organic matter.	Very limited: depth to saturated zone, too clayey, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too clayey, hard to compact, ponding.
Allendale-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, content of organic matter.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.
67A: Bowers-----	Very limited: restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
Deerheart-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.
70: Lupton-----	Very limited: depth to saturated zone, subsidence, ponding.	Very limited: content of organic matter, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, seepage, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, ponding, seepage.
71: Tawas-----	Very limited: depth to saturated zone, subsidence, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
75B: Rubicon-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
75D: Rubicon-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
78. Pits, borrow					
81B: Grayling-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
81D: Grayling-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
81E: Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
81F: Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
82B. Udorthents					
83B: Udipsamments-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, too acid.
86: Histosols-----	Very limited: ponding, depth to saturated zone, subsidence.	Very limited: ponding, content of organic matter, depth to saturated zone, seepage.	Very limited: depth to saturated zone, content of organic matter, seepage, ponding.	Very limited: ponding, depth to saturated zone, seepage.	Very limited: ponding, depth to saturated zone, content of organic matter, seepage.
Aquents-----	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
87: Ausable-----	Very limited: flooding, depth to saturated zone, filtering capacity, ponding.	Very limited: flooding, seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, too sandy, ponding.	Very limited: flooding, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
90B: Chinwhisker-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
93B: Tacoda-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.
Wakeley-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: seepage, ponding, content of organic matter.	Very limited: depth to saturated zone, too clayey, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too clayey, hard to compact, ponding.
94F: Klacking-----	Very limited: slope.	Very limited: slope, seepage.	Very limited: too sandy, slope, seepage.	Very limited: seepage, slope.	Very limited: too sandy, slope, seepage.
McGinn-----	Very limited: slope, restricted permeability.	Very limited: slope, seepage.	Very limited: slope.	Very limited: seepage, slope.	Very limited: slope.
96D2: Mongo-----	Very limited: restricted permeability, slope.	Very limited: slope.	Very limited: slope, too clayey.	Very limited: slope.	Very limited: too clayey, hard to compact, slope.
98C: Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
110D: Mongol-----	Very limited: restricted permeability, slope.	Very limited: slope.	Very limited: too clayey, slope.	Very limited: slope.	Very limited: too clayey, hard to compact, slope.
110F: Mongol-----	Very limited: restricted permeability, slope.	Very limited: slope.	Very limited: slope, too clayey.	Very limited: slope.	Very limited: slope, too clayey, hard to compact.
111B: Kellogg-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: too clayey, depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Very limited: too clayey, depth to saturated zone.
111C: Kellogg-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: too clayey, depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Very limited: too clayey, depth to saturated zone, slope.
116B: Mancelona-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.
116C: Mancelona-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, gravel content, slope.
116D: Mancelona-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope, gravel content.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
116E: Mancelona-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.
123D: Klackung-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
125B: Melita-----	Very limited: restricted permeability, filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy.	Very limited: seepage.	Very limited: too sandy.
144B: Perecheney-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: seepage, too sandy, depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Very limited: too sandy, seepage, depth to saturated zone.
144C: Perecheney-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: seepage, too sandy, depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Very limited: too sandy, seepage, depth to saturated zone, slope.
200. Borrow source					
210B: Grayling-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
210C: Grayling-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
210D: Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
210E: Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
211B: Grayling, banded substratum-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
211C: Grayling, banded substratum-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
211D: Grayling, banded substratum-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
211E: Grayling, banded substratum-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
211E: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
212B: Grayling, very deep water table-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
213B: Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
213C: Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
213D: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
214B: Oxyaquic Udipsamments-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage.
215B: Typic Udipsamments, loamy substratum---	Very limited: restricted permeability, filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
215C: Typic Udipsamments, loamy substratum---	Very limited: restricted permeability, filtering capacity, slope.	Very limited: seepage, slope.	Very limited: too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
215D: Typic Udipsamments, loamy substratum---	Very limited: slope, restricted permeability, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
220B: Typic Udipsamments--	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
220C: Typic Udipsamments--	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
220D: Typic Udipsamments--	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
220E: Typic Udipsamments--	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
221B: Typic Udipsamments, banded substratum--	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Lamellic Udipsamments-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
221C: Typic Udipsamments, banded substratum--	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Lamellic Udipsamments-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
221D: Typic Udipsamments, banded substratum--	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Lamellic Udipsamments-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
221E: Typic Udipsamments, banded substratum--	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Lamellic Udipsamments-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
222B: Typic Udipsamments, very deep water table-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
223B: Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
223B: Grayling-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
223C: Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Grayling-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
223D: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
223E: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Grayling-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
224B: Crowell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
225B: Entic Haplorthods, sandy, loamy substratum-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
225C: Entic Haplorthods, sandy, loamy substratum-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
225D: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
225E: Entic Haplorthods, sandy, loamy substratum-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
230C: Entic Haplorthods, sandy-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, content of organic matter.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
230D: Entic Haplorthods, sandy-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
230E: Entic Haplorthods, sandy-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
231B: Lamellic Haplorthods, sandy	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.
Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, content of organic matter, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
231C: Lamellic Haplorthods, sandy	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, content of organic matter.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
231D: Lamellic Haplorthods, sandy	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
231D: Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
231E: Lamellic Haplorthods, sandy	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
232B: Entic Haplorthods, sandy, very deep water table-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Alfic Haplorthods, sandy, very deep water table-----	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, content of organic matter, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
232D: Entic Haplorthods, sandy, very deep water table-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
232D: Alfic Haplorthods, sandy, very deep water table-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
233B: Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, content of organic matter, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.
233C: Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, content of organic matter.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
233D: Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
233E: Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
234B: Lamellic Oxyaquic Haplorthods, sandy	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.
235B: Alfic Haplorthods, sandy over loamy---	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, content of organic matter, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
235B: Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, content of organic matter, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
235C: Alfic Haplorthods, sandy over loamy---	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, content of organic matter.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Alfic Haplorthods, sandy-----	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, content of organic matter.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
235D: Alfic Haplorthods, sandy over loamy---	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
235E: Alfic Haplorthods, sandy over loamy---	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
235E: Alfic Haplorthods, sandy-----	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage, content of organic matter.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
236B: Arenic Hapludalfs---	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: seepage, too sandy.
236C: Arenic Hapludalfs---	Very limited: filtering capacity, slope, restricted permeability.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: seepage, slope, too sandy.
236D: Arenic Hapludalfs---	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.
236E: Arenic Hapludalfs---	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.
237B: Glossudalfs, loamy--	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, slope.	Very limited: seepage.	Very limited: seepage.	Somewhat limited: seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
237C: Glossudalfs, loamy--	Very limited: filtering capacity, restricted permeability, slope.	Very limited: seepage, slope.	Very limited: seepage, slope.	Very limited: seepage, slope.	Somewhat limited: slope, seepage.
237D: Glossudalfs, loamy--	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage.
237E: Glossudalfs, loamy--	Very limited: slope, filtering capacity, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope, seepage.
247B: Glennie-----	Very limited: restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: too sandy, depth to saturated zone.	Somewhat limited: depth to saturated zone.	Somewhat limited: too sandy, depth to saturated zone.
Ossineke-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
247C: Glennie-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: too sandy, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, slope.	Somewhat limited: too sandy, depth to saturated zone, slope.
Ossineke-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, seepage, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
250D: Glossudalfs-----	Very limited: filtering capacity, slope, restricted permeability.	Very limited: seepage, slope.	Very limited: slope, seepage.	Very limited: seepage, slope.	Very limited: slope, seepage.
Haplosaprists, euic	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
252A: Haplosaprists, euic	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
254A: Haplosaprists, euic	Very limited: flooding, depth to saturated zone, filtering capacity, ponding.	Very limited: flooding, seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, too sandy, ponding.	Very limited: flooding, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Fluvaquents-----	Very limited: flooding, ponding, depth to saturated zone, filtering capacity.	Very limited: ponding, flooding, seepage, depth to saturated zone, content of organic matter.	Very limited: flooding, depth to saturated zone, ponding, seepage, too sandy.	Very limited: flooding, ponding, depth to saturated zone, seepage.	Very limited: ponding, depth to saturated zone, too sandy, seepage.
Aquic Udipsamments--	Very limited: flooding, depth to saturated zone, filtering capacity.	Very limited: flooding, seepage, depth to saturated zone.	Very limited: flooding, depth to saturated zone, seepage, too sandy.	Very limited: flooding, depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
262A: Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
264A: Allendale-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, content of organic matter.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.
265B: Glossudalfs-----	Very limited: filtering capacity, restricted permeability.	Very limited: seepage, slope.	Very limited: seepage.	Very limited: seepage.	Somewhat limited: seepage.
Allendale-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, content of organic matter.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.
272: Endoaquods-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Fluvaquents, occasionally flooded-----	Very limited: flooding, depth to saturated zone, filtering capacity.	Very limited: flooding, seepage, depth to saturated zone, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, too sandy.	Very limited: flooding, depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
273: Leafriver-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Wakeley-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: seepage, ponding, content of organic matter.	Very limited: depth to saturated zone, too clayey, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too clayey, hard to compact, ponding.
274: Typic Endoaquods, wet-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	---	Very limited: depth to saturated zone, seepage, ponding.	---
280: Aquents-----	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.	Very limited: ponding, depth to saturated zone.
Histosols-----	Very limited: ponding, depth to saturated zone, filtering capacity, subsidence.	Very limited: ponding, seepage, depth to saturated zone, content of organic matter.	Very limited: depth to saturated zone, ponding, seepage, too sandy.	Very limited: ponding, depth to saturated zone, seepage.	Very limited: ponding, depth to saturated zone, too sandy, seepage.
281: Haplosaprists, dysic-----	Very limited: depth to saturated zone, ponding.	Very limited: content of organic matter, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, seepage, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, content of organic matter, too acid, ponding, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
282: Haplosaprists, euic	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
307B: Klacking-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
307E: Klacking-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
338B: Islandlake-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
338E: Islandlake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
352B: Deford-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
Croswell-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: too sandy, seepage, depth to saturated zone.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
360: Wakeley-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: seepage, ponding, content of organic matter.	Very limited: depth to saturated zone, too clayey, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too clayey, hard to compact, ponding.
362B: Millersburg-----	Somewhat limited: restricted permeability.	Very limited: seepage, slope.	Not limited-----	Not limited-----	Not limited.
362D: Millersburg-----	Somewhat limited: slope, restricted permeability.	Very limited: seepage, slope.	Somewhat limited: slope.	Somewhat limited: slope.	Somewhat limited: slope.
362E: Millersburg-----	Very limited: slope, restricted permeability.	Very limited: slope, seepage.	Very limited: slope.	Very limited: slope.	Very limited: slope.
368A: Au Gres-----	Very limited: depth to saturated zone, filtering capacity.	Very limited: seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, too sandy.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too sandy, seepage.
Deford-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
369: Deford-----	Very limited: depth to saturated zone, filtering capacity, ponding.	Very limited: seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: depth to saturated zone, seepage, too sandy, ponding.	Very limited: depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
371: Springport-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: ponding.	Very limited: depth to saturated zone, ponding, too clayey.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
380. Access denied					
384B: Iosco-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone.
388B: Millersburg-----	Somewhat limited: restricted permeability.	Very limited: seepage, slope.	Not limited-----	Not limited-----	Not limited.
Klacking-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
388D: Millersburg-----	Somewhat limited: slope, restricted permeability.	Very limited: seepage, slope.	Somewhat limited: slope.	Somewhat limited: slope.	Somewhat limited: slope.
Klacking-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
388E: Millersburg-----	Very limited: slope, restricted permeability.	Very limited: slope, seepage.	Very limited: slope.	Very limited: slope.	Very limited: slope.
Klacking-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
390B: Horsehead-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.
Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
390D: Horsehead-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope, gravel content.
Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
390E: Horsehead-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.
Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
390F: Horsehead-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.
Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
391B: Horsehead-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
393B: Morganlake-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone.
393C: Morganlake-----	Very limited: depth to saturated zone, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, slope.
399D: Menominee-----	Very limited: restricted permeability, slope.	Very limited: slope, seepage.	Very limited: slope, too clayey.	Very limited: seepage, slope.	Very limited: slope, too clayey.
Bamfield, sandy substratum-----	Very limited: restricted permeability, slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, slope.	Very limited: slope.	Very limited: slope.
Blue Lake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: too sandy, slope, seepage.	Very limited: seepage, slope.	Very limited: too sandy, slope, seepage.
400F: Menominee-----	Very limited: slope, restricted permeability.	Very limited: slope, seepage.	Very limited: slope, too clayey.	Very limited: slope, seepage.	Very limited: slope, too clayey.
Bamfield, sandy substratum-----	Very limited: slope, restricted permeability, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope.	Very limited: slope.
Blue Lake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
424B: Morganlake-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone.
Ossineke, sandy substratum-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability.	Somewhat limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
Blue Lake-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.
424C: Morganlake-----	Very limited: depth to saturated zone, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, slope.
Ossineke, sandy substratum-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability, slope.	Very limited: slope, seepage, depth to saturated zone.	Very limited: depth to saturated zone, seepage, slope.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.
Blue Lake-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
426B: Coppler-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
441B: Morganlake-----	Very limited: depth to saturated zone, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone.
Nester-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Somewhat limited: depth to saturated zone, too clayey.
441C: Morganlake-----	Very limited: depth to saturated zone, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, slope.
Nester-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, too clayey, slope.
452D: Bamfield, sandy substratum-----	Very limited: restricted permeability, slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, slope.	Very limited: slope.	Very limited: slope.
475B: Graycalm-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Klacking-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
475D: Graycalm-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
475D: Klacking-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
475E: Graycalm-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Klacking-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
476B: Klacking-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Perecheney-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: seepage, too sandy, depth to saturated zone.	Very limited: seepage, depth to saturated zone.	Very limited: too sandy, seepage, depth to saturated zone.
476D: Klacking-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Perecheney-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: seepage, too sandy, depth to saturated zone, slope.	Very limited: seepage, depth to saturated zone, slope.	Very limited: too sandy, seepage, depth to saturated zone, slope.
488A: Allendale-----	Very limited: restricted permeability, depth to saturated zone, filtering capacity.	Very limited: seepage, content of organic matter.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone, seepage.	Very limited: depth to saturated zone, too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
496B: Gerrish-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: seepage, too sandy.
Grayling-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
503D: Bamfield, sandy substratum-----	Very limited: restricted permeability, filtering capacity, slope.	Very limited: slope, seepage.	Very limited: seepage, slope.	Somewhat limited: slope.	Somewhat limited: slope.
Millersburg-----	Somewhat limited: slope, restricted permeability.	Very limited: seepage, slope.	Somewhat limited: slope.	Somewhat limited: slope.	Somewhat limited: slope.
Horsehead-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope, gravel content.
503E: Bamfield, sandy substratum-----	Very limited: slope, restricted permeability, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage.	Very limited: slope.	Very limited: slope.
Millersburg-----	Very limited: slope, restricted permeability.	Very limited: slope, seepage.	Very limited: slope.	Very limited: slope.	Very limited: slope.
Horsehead-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
504B: Coppler-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.
Horsehead-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.
504D: Coppler-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope, gravel content.
Horsehead-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope, gravel content.
504E: Coppler-----	Very limited: filtering capacity, slope.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.
Horsehead-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage, gravel content.
505B: Ossineke-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.
Millersburg-----	Somewhat limited: restricted permeability.	Very limited: seepage, slope.	Not limited-----	Not limited-----	Not limited.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
505B: Horsehead-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage, gravel content.
505C: Ossineke-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, seepage, depth to saturated zone.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, slope.
Millersburg-----	Somewhat limited: restricted permeability, slope.	Very limited: seepage, slope.	Somewhat limited: slope.	Somewhat limited: slope.	Somewhat limited: slope.
Horsehead-----	Very limited: filtering capacity, slope.	Very limited: seepage, slope.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, gravel content, slope.
506B: Durkeelake-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability.	Very limited: seepage, depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey.	Very limited: seepage, depth to saturated zone.	Somewhat limited: depth to saturated zone, too clayey.
506C: Durkeelake-----	Very limited: depth to saturated zone, filtering capacity, restricted permeability, slope.	Very limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: seepage, depth to saturated zone, slope.	Somewhat limited: depth to saturated zone, too clayey, slope.
507D: Islandlake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
508B:					
Islandlake-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: seepage, too sandy.	Very limited: seepage.	Very limited: too sandy, seepage.
Blue Lake-----	Very limited: filtering capacity.	Very limited: seepage, slope.	Very limited: too sandy, seepage.	Very limited: seepage.	Very limited: too sandy, seepage.
508D:					
Islandlake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: seepage, too sandy, slope.	Very limited: seepage, slope.	Very limited: too sandy, seepage, slope.
Blue Lake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: too sandy, slope, seepage.	Very limited: seepage, slope.	Very limited: too sandy, slope, seepage.
508E:					
Islandlake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, seepage, too sandy.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
Blue Lake-----	Very limited: slope, filtering capacity.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.	Very limited: slope, seepage.	Very limited: slope, too sandy, seepage.
509A:					
Colonville-----	Very limited: flooding, depth to saturated zone.	Very limited: flooding, depth to saturated zone, seepage.	Very limited: flooding, depth to saturated zone, seepage.	Very limited: flooding, depth to saturated zone, seepage.	Very limited: depth to saturated zone, seepage.
Thunderbay-----	Very limited: flooding, depth to saturated zone, filtering capacity, ponding, restricted permeability.	Very limited: flooding, seepage, depth to saturated zone, ponding, content of organic matter.	Very limited: flooding, depth to saturated zone, seepage, too sandy, ponding.	Very limited: flooding, depth to saturated zone, seepage, ponding.	Very limited: depth to saturated zone, too sandy, seepage, ponding.
510:					
Deerheart-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoons	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
511B: Parmalee-----	Very limited: restricted permeability, depth to saturated zone.	Somewhat limited: seepage, slope, depth to saturated zone.	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
511C: Parmalee-----	Very limited: restricted permeability, depth to saturated zone, slope.	Very limited: slope, seepage, depth to saturated zone.	Very limited: depth to saturated zone, too clayey, slope.	Very limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, too clayey, slope.
512A: Algonquin-----	Very limited: restricted permeability, depth to saturated zone.	Not limited-----	Very limited: depth to saturated zone, too clayey.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.
Springport-----	Very limited: restricted permeability, depth to saturated zone, ponding.	Very limited: ponding.	Very limited: depth to saturated zone, ponding, too clayey.	Very limited: depth to saturated zone, ponding.	Very limited: depth to saturated zone, ponding, too clayey.
513A: Bowers-----	Very limited: restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, too clayey.

Table 16.--Construction Materials

(For the purposes of this table, gravel is defined as particles ranging from about 0.2 inch to 3 inches in diameter. Soils are rated as a possible gravel source with a minimum of 25 percent gravel by weight and a probable gravel source with a minimum of 50 percent gravel by weight. The probability of the soil material being a source of gravel is reduced by the content of rock fragments larger than 3 inches in diameter. The intent of the ratings is to show only the probability of finding material of the defined quantity and quality. The suitability for specific purposes is not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Absence of an entry indicates that the soil was not rated or that no rating is applicable. See text for further explanation of the ratings in this table)

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
13: Tawas-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Lupton-----	Improbable: Content of organic matter	Improbable: Content of organic matter	Poor: Depth to saturated zone Content of organic matter	Poor: Depth to saturated zone
14: Dawson-----	Bottom layer not a source	Bottom layer not a source	Poor: Depth to saturated zone Content of organic matter Too acid	Poor: Depth to saturated zone
Loxley-----	Improbable: Content of organic matter	Improbable: Content of organic matter	Poor: Depth to saturated zone Content of organic matter Too acid	Poor: Depth to saturated zone
15A: Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Fair: Depth to saturated zone
Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
16B: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
16C: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
16D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good
17A: Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Depth to saturated zone
17B: Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Depth to saturated zone
18A: Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
19: Leafriver-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
20B: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
20D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
20F:				
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
21D:				
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
23:				
Ausable-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim	Poor: Depth to saturated zone
Bowstring-----	Improbable: Content of organic matter	Improbable: Content of organic matter	Poor: Depth to saturated zone Content of organic matter	Poor: Depth to saturated zone
24A:				
Kinross-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
26B:				
Cublake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Hard to reclaim Too acid	Fair: Depth to saturated zone
27A:				
Tacoda-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid	Poor: Depth to saturated zone Low strength Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
31B: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
31C: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
31D: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Good
32B: Kellogg-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Too acid Rock fragments	Fair: Depth to saturated zone Shrink-swell
32C: Kellogg-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Too acid Rock fragments Slope	Fair: Depth to saturated zone Shrink-swell
36B: Annalake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Too sandy Depth to saturated zone	Fair: Depth to saturated zone
37A: Richter-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone
41C: McGinn-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Too acid	Good
44B: Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content	Fair: Depth to saturated zone Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
44C: Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content Slope	Fair: Depth to saturated zone Shrink-swell
47D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good
47F: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
50B: Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
Kinross-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Fair: Depth to saturated zone
51: Tawas-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Leafriver-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
53B: Negwegon-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Fair: Depth to saturated zone Shrink-swell
53C: Negwegon-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone Slope	Fair: Depth to saturated zone Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
54A: Algonquin-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Fair: Depth to saturated zone Shrink-swell Low strength
56B: Nester-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Poor: Depth to saturated zone Shrink-swell Low strength
56C: Nester-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone Slope	Poor: Depth to saturated zone Shrink-swell Low strength
57B: Kawkawlin-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Poor: Depth to saturated zone Shrink-swell Low strength
58A: Wakeley-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Depth to saturated zone Too sandy	Poor: Depth to saturated zone Shrink-swell
Allendale-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Poor: Depth to saturated zone Shrink-swell
67A: Bowers-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Poor: Depth to saturated zone Shrink-swell Low strength
Deerheart-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Poor: Depth to saturated zone Shrink-swell Low strength
70: Lupton-----	Improbable: Content of organic matter	Improbable: Content of organic matter	Poor: Depth to saturated zone Content of organic matter	Poor: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
71: Tawas-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
75B: Rubicon-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
75D: Rubicon-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Slope	Good
78. Pits, borrow				
81B: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
81D: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
81E: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
81F: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
82B. Udorthents				
83B: Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
86: Histosols-----	Bottom layer not a source Content of organic matter	Not rated-----	Not rated-----	Poor: Depth to saturated zone
Aquents-----	Bottom layer not a source	Not rated-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
87: Ausable-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim	Poor: Depth to saturated zone
90B: Chinwhisker-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Fair: Depth to saturated zone
93B: Tacoda-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid	Poor: Depth to saturated zone Low strength Shrink-swell
Wakeley-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone Shrink-swell
94F: Klackang-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: slope
McGinn-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Poor: slope
96D2: Mongo-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Slope	Fair: Shrink-swell
98C: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
110D: Mongo-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Slope Carbonate content	Poor: Shrink-swell Low strength
110F: Mongo-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Slope Too clayey Carbonate content	Poor: Slope Low strength Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
111B: Kellogg-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Fair: Depth to saturated zone Shrink-swell
111C: Kellogg-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments Slope	Fair: Depth to saturated zone Shrink-swell
116B: Mancelona-----	Thickest layer not a source Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments	Good
116C: Mancelona-----	Thickest layer not a source Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments Slope	Good
116D: Mancelona-----	Thickest layer not a source Bottom layer possible source	Probable-----	Poor: Slope Too sandy Hard to reclaim Rock fragments	Good
116E: Mancelona-----	Thickest layer not a source Bottom layer possible source	Probable-----	Poor: Slope Too sandy Hard to reclaim Rock fragments	Poor: Slope
123D: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments Too acid	Good
125B: Melita-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Fair: Low strength
144B: Perechney-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone	Fair: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
144C: Perecheney-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone Slope	Fair: Depth to saturated zone
200. Borrow source				
210B: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
210C: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Slope	Good
210D: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Too sandy	Fair: Slope
210E: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Too sandy	Poor: Slope
211B: Grayling, banded substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
211C: Grayling, banded substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Too acid	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
211D: Grayling, banded substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Too acid	Fair: Slope

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
211D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
211E: Grayling, banded substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Too acid	Poor: Slope
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
212B: Grayling, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
213B: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
213C: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
213D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
214B: Oxyaquic Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
215B: Typic Udipsamments, loamy substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
215C: Typic Udipsamments, loamy substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
215D: Typic Udipsamments, loamy substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
220B: Typic Udipsamments--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
220C: Typic Udipsamments--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Slope	Good
220D: Typic Udipsamments--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Fair: Slope
220E: Typic Udipsamments--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Poor: Slope
221B: Typic Udipsamments, banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
Lamellic Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Rock fragments	Good
221C: Typic Udipsamments, banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Slope	Good
Lamellic Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Rock fragments Slope	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
221D: Typic Udipsamments, banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Fair: Slope
Lamellic Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid Rock fragments	Fair: Slope
221E: Typic Udipsamments, banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Poor: Slope
Lamellic Udipsamments-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid Rock fragments	Poor: Slope
222B: Typic Udipsamments, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
223B: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
223C: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Slope	Good
223D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
223D: Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Too sandy	Fair: Slope
223E: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Too sandy	Poor: Slope
224B: Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Fair: Depth to saturated zone
225B: Entic Haplorthods, sandy, loamy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
225C: Entic Haplorthods, sandy, loamy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
225D: Entic Haplorthods, sandy, loamy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
225E: Entic Haplorthods, sandy, loamy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
230C: Entic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
230C: Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
230D: Entic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Fair: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
230E: Entic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Poor: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
231B: Lamellic Haplorthods, sandy	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
231C: Lamellic Haplorthods, sandy	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
231D: Lamellic Haplorthods, sandy	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
231E: Lamellic Haplorthods, sandy	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
232B: Entic Haplorthods, sandy, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid	Good
Alfic Haplorthods, sandy, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
232D: Entic Haplorthods, sandy, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid	Fair: Slope
Alfic Haplorthods, sandy, very deep water table-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
233B: Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
233B: Entic Haplorthods, sandy, fine-loamy banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
233C: Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
Entic Haplorthods, sandy, fine-loamy banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
233D: Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
Entic Haplorthods, sandy, fine-loamy banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Fair: Slope
233E: Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
Entic Haplorthods, sandy, fine-loamy banded substratum--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
234B: Lamellic Oxyaquic Haplorthods, sandy	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid Rock fragments	Fair: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
235B: Alfic Haplorthods, sandy over loamy---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
235C: Alfic Haplorthods, sandy over loamy---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
235D: Alfic Haplorthods, sandy over loamy---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
235E: Alfic Haplorthods, sandy over loamy---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
Alfic Haplorthods, sandy-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
236B: Arenic Hapludalfs---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
236C: Arenic Hapludalfs---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
236D: Arenic Hapludalfs---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Fair: Slope
236E: Arenic Hapludalfs---	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
237B: Glossudalfs, loamy--	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Rock fragments	Good
237C: Glossudalfs, loamy--	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Rock fragments	Good
237D: Glossudalfs, loamy--	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Rock fragments	Fair: Slope
237E: Glossudalfs, loamy--	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Rock fragments	Poor: Slope
247B: Glennie-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Hard to reclaim Too sandy	Fair: Low strength
Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content	Fair: Depth to saturated zone Shrink-swell
247C: Glennie-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Hard to reclaim Too sandy Slope	Fair: Low strength
Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content Slope	Fair: Depth to saturated zone Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
250D: Glossudalfs-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Rock fragments	Good
Haplosaprists, euic	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
252A: Haplosaprists, euic	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
254A: Haplosaprists, euic	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Fluvaquents-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Aquic Udipsamments--	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid	Poor: Depth to saturated zone
262A: Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
264A: Allendale-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Poor: Depth to saturated zone Shrink-swell
265B: Glossudalfs-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
265B: Allendale-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Poor: Depth to saturated zone Shrink-swell
272: Endoaquods-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Poor: Depth to saturated zone
Fluvaquents, occasionally flooded-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
273: Leafriver-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Wakeley-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Depth to saturated zone Too sandy	Poor: Depth to saturated zone Shrink-swell
274: Typic Endoaquods, wet-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
280: Aquents-----	Bottom layer not a source	Not rated-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone
Histosols-----	Bottom layer not a source	Not rated-----	Not rated-----	Poor: Depth to saturated zone
281: Haplosaprists, dysic	Improbable: Content of organic matter	Improbable: Content of organic matter	Poor: Depth to saturated zone Content of organic matter Too acid	Poor: Depth to saturated zone
282: Haplosaprists, euic	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
307B: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments Too acid	Good
307E: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Rock fragments Too sandy Too acid	Poor: Slope
338B: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
338E: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Rock fragments Too sandy	Poor: Slope
352B: Deford-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
Croswell-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Depth to saturated zone
360: Wakeley-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Depth to saturated zone Too sandy	Poor: Depth to saturated zone Shrink-swell
362B: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Too acid Rock fragments	Good
362D: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Too acid Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
362E: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Rock fragments	Poor: Slope
368A: Au Gres-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Rock fragments Too acid	Poor: Depth to saturated zone
Deford-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
369: Deford-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Poor: Depth to saturated zone
371: Springport-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone Too clayey Carbonate content	Poor: Depth to saturated zone Low strength Shrink-swell
380. Access denied				
384B: Iosco-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone Low strength Shrink-swell
388B: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Too acid Rock fragments	Good
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Too acid Rock fragments	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
388D: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Too acid Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
388D: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Too acid Rock fragments	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
388E: Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too acid Rock fragments	Poor: Slope
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Too acid Rock fragments	Poor: Slope
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
390B: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
390D: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim Slope	Good
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
390E: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Slope Too sandy Rock fragments Hard to reclaim	Poor: Slope
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
390F: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Slope Too sandy Rock fragments Hard to reclaim	Poor: Slope
Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
391B: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim	Good
393B: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Low strength Depth to saturated zone Shrink-swell
393C: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Slope	Fair: Low strength Depth to saturated zone Shrink-swell
399D: Menominee-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Slope Too acid	Fair: Shrink-swell
Bamfield, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Hard to reclaim	Poor: Low strength Shrink-swell
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
400F: Menominee-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Slope Too acid	Poor: Slope Shrink-swell
Bamfield, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Hard to reclaim	Poor: Slope Low strength Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
400F: Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Poor: Slope
424B: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Low strength Depth to saturated zone Shrink-swell
Ossineke, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone	Fair: Depth to saturated zone Low strength Shrink-swell
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
424C: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Slope	Fair: Low strength Depth to saturated zone Shrink-swell
Ossineke, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone Slope	Fair: Depth to saturated zone Low strength Shrink-swell
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good
426B: Coppler-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim	Good
441B: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone	Fair: Low strength Depth to saturated zone Shrink-swell
Nester-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone	Poor: Low strength Depth to saturated zone Shrink-swell

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
441C: Morganlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Slope	Fair: Low strength Depth to saturated zone Shrink-swell
Nester-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too clayey Depth to saturated zone Slope	Poor: Low strength Depth to saturated zone Shrink-swell
452D: Bamfield, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Hard to reclaim	Poor: Low strength Shrink-swell
475B: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments Too acid	Good
475D: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Good
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments Too acid	Good
475E: Graycalm-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments Too acid	Poor: Slope
476B: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments Too acid	Good
Perechney-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone	Fair: Depth to saturated zone

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
476D: Klacking-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments Too acid	Good
Perecheney-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Depth to saturated zone Slope	Fair: Depth to saturated zone
488A: Allendale-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Too sandy Depth to saturated zone Rock fragments	Poor: Depth to saturated zone Shrink-swell
496B: Gerrish-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
Grayling-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
503D: Bamfield, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Hard to reclaim	Poor: Low strength Shrink-swell
Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Rock fragments Too acid	Good
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Rock fragments Hard to reclaim Slope	Good
503E: Bamfield, sandy substratum-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Slope Hard to reclaim	Poor: Low strength Shrink-swell Slope
Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Rock fragments Too acid	Fair: Slope

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
503E: Horsehead-----	Bottom layer possible source	Probable-----	Poor: Slope Rock fragments Hard to reclaim Too sandy	Fair: Slope
504B: Coppler-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim	Good
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments	Good
504D: Coppler-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Slope	Good
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments Slope	Good
504E: Coppler-----	Bottom layer possible source	Probable-----	Poor: Slope Too sandy Hard to reclaim	Poor: Slope
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Slope Too sandy Hard to reclaim Rock fragments	Poor: Slope
505B: Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content	Fair: Depth to saturated zone Shrink-swell
Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Too acid Rock fragments	Good
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
505C: Ossineke-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Hard to reclaim Depth to saturated zone Carbonate content Slope	Fair: Depth to saturated zone Shrink-swell
Millersburg-----	Bottom layer not a source Thickest layer not a source	Probable-----	Fair: Too acid Slope Rock fragments	Good
Horsehead-----	Bottom layer possible source	Probable-----	Poor: Too sandy Hard to reclaim Rock fragments Slope	Good
506B: Durkeelake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid	Fair: Depth to saturated zone
506C: Durkeelake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Depth to saturated zone Too acid Slope	Fair: Depth to saturated zone
507D: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
508B: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Rock fragments	Good
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy	Good
508D: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope Rock fragments	Good
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Too sandy Slope	Good

Table 16.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel	Potential as source of sand	Potential as source of topsoil	Potential as source of roadfill
508E: Islandlake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy Rock fragments	Poor: Slope
Blue Lake-----	Bottom layer not a source Thickest layer not a source	Probable-----	Poor: Slope Too sandy	Poor: Slope
509A: Colonville-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone
Thunderbay-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone	Poor: Depth to saturated zone
510: Deerheart-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone Too clayey	Poor: Depth to saturated zone Shrink-swell Low strength
511B: Parmalee-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Fair: Depth to saturated zone Too clayey	Fair: Depth to saturated zone
511C: Parmalee-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Fair: Depth to saturated zone Too clayey Slope	Fair: Depth to saturated zone
512A: Algonquin-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone Too clayey	Poor: Depth to saturated zone Shrink-swell Low strength
Springport-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone Too clayey Carbonate content	Poor: Depth to saturated zone Shrink-swell Low strength
513A: Bowers-----	Bottom layer not a source Thickest layer not a source	Improbable-----	Poor: Depth to saturated zone Too clayey	Poor: Depth to saturated zone Low strength Shrink-swell

Table 17.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Absence of an entry indicates that the soil was not rated or that no rating is applicable. 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	Grassed waterways	Drainage
13: Tawas-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Lupton-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Somewhat limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, content of organic matter, frost action.
14: Dawson-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Loxley-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Somewhat limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, content of organic matter, frost action.
15A: Crowell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
16B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
16C: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
16D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
17A: Crowell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
17B: Crowell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
18A: Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
19: Leafriver-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
20B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Grayling-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
20D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
20F: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
21D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
23: Ausable-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: flooding, depth to saturated zone, cutbanks cave.
Bowstring-----	Very limited: seepage.		Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: flooding, depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
24A: Kinross-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
26B: Cublake-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: depth to water.	Somewhat limited: droughty, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
27A: Tacoda-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
31B: Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
31C: Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
31D: Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
32B: Kellogg-----	Very limited: seepage.	Very limited: depth to saturated zone.	Very limited: depth to water.	Somewhat limited: restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
32C: Kellogg-----	Very limited: seepage.	Very limited: depth to saturated zone.	Very limited: depth to water.	Very limited: slope, restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
36B: Annalake-----	Somewhat limited: seepage.	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Somewhat limited: water erosion, depth to saturated zone.	Very limited: cutbanks cave, depth to saturated zone.
37A: Richter-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, water erosion.	Very limited: depth to saturated zone, cutbanks cave, frost action.
41C: McGinn-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
44B: Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
44C: Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
47D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
47F: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
50B: Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Kinross-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave
Croswell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
51: Tawas-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Leafriver-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
53B: Negwegon-----	Not limited-----	Very limited: depth to saturated zone, hard to pack.	Very limited: depth to water.	Very limited: restricted permeability, water erosion, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
53C: Negwegon-----	Not limited-----	Very limited: depth to saturated zone, hard to pack.	Very limited: depth to water.	Very limited: restricted permeability, slope, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
54A: Algonquin-----	Not limited-----	Very limited: depth to saturated zone, hard to pack.	Very limited: depth to water.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
56B: Nester-----	Not limited-----	Very limited: depth to saturated zone.	Very limited: depth to water.	Somewhat limited: restricted permeability, water erosion, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
56C: Nester-----	Not limited-----	Very limited: depth to saturated zone.	Very limited: depth to water.	Very limited: slope, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
57B: Kawkawlin-----	Not limited-----	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
58A: Wakeley-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
58A: Allendale-----	Very limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, droughty.	Very limited: depth to saturated zone, cutbanks cave.
67A: Bowers-----	Somewhat limited: seepage.	Very limited: depth to saturated zone.	Somewhat limited: slow refill, cutbanks cave.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
Deerheart-----	Not limited-----	Very limited: depth to saturated zone, ponding, piping.	Somewhat limited: cutbanks cave, slow refill.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action.
70: Lupton-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Somewhat limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, content of organic matter, frost action.
71: Tawas-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
75B: Rubicon-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
75D: Rubicon-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
78. Pits, borrow					
81B: Grayling-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
81D: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
81E: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
81F: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
82B. Udorthents					
83B: Udipsamments-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
86: Histosols-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Aquents-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
87: Ausable-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: flooding, depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
90B: Chinwhisker-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
93B: Tacoda-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Wakeley-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
94F: Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
McGinn-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
96D2: Mongo-----	Somewhat limited: slope.	Somewhat limited: hard to pack.	Very limited: depth to water.	Very limited: slope, water erosion, restricted permeability.	Very limited: slope, cutbanks cave.
98C: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: slope, droughty.	Very limited: cutbanks cave.
110D: Mongo-----	Somewhat limited: slope.	Somewhat limited: hard to pack.	Very limited: depth to water.	Very limited: slope, restricted permeability, water erosion.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
110F: Mongol-----	Somewhat limited: slope.	Somewhat limited: hard to pack.	Very limited: depth to water.	Very limited: slope, restricted permeability, water erosion.	Very limited: slope, cutbanks cave.
111B: Kellogg-----	Very limited: seepage.	Very limited: depth to saturated zone.	Very limited: depth to water.	Somewhat limited: restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
111C: Kellogg-----	Very limited: seepage.	Very limited: depth to saturated zone.	Very limited: depth to water.	Very limited: slope, restricted permeability, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
116B: Mancelona-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: droughty.	Very limited: cutbanks cave,
116C: Mancelona-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
116D: Mancelona-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
116E: Mancelona-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
123D: Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
125B: Melita-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
144B: Perecheney-----	Very limited: seepage.	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Somewhat limited: depth to saturated zone.	Very limited: cutbanks cave, depth to saturated zone.
144C: Perecheney-----	Very limited: seepage.	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: slope, depth to saturated zone.	Very limited: cutbanks cave, depth to saturated zone.
200. Borrow source					
210B: Grayling-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
210C: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
210D: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
210E: Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
211B: Grayling, banded substratum-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
211B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty, slope.	Very limited: cutbanks cave.
211C: Grayling, banded substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
211D: Grayling, banded substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
211E: Grayling, banded substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
212B: Grayling, very deep water table-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
213B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave,

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
213C: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
213D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
214B: Oxyaquic Udipsamments-----	Very limited: seepage.	Somewhat limited: seepage, depth to saturated zone.	Very limited: cutbanks cave, depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave, depth to saturated zone.
215B: Typic Udipsamments, loamy substratum---	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
215C: Typic Udipsamments, loamy substratum---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
215D: Typic Udipsamments, loamy substratum---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
220B: Typic Udipsamments--	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
220C: Typic Udipsamments--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
220D: Typic Udipsamments--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
220E: Typic Udipsamments--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
221B: Typic Udipsamments, banded substratum--	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Lamellic Udipsamments-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
221C: Typic Udipsamments, banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Lamellic Udipsamments-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
221D: Typic Udipsamments, banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Lamellic Udipsamments-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
221E: Typic Udipsamments, banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Lamellic Udipsamments-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
222B: Typic Udipsamments, very deep water table-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
223B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Grayling-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
223C: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
223D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
223E: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Grayling-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
224B: Croswell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
225B: Entic Haplorthods, sandy, loamy substratum-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
225C: Entic Haplorthods, sandy, loamy substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
225D: Entic Haplorthods, sandy, loamy substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
225E: Entic Haplorthods, sandy, loamy substratum-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
230C: Entic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
230D: Entic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
230E: Entic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
231B: Lamellic Haplorthods, sandy	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
231C: Lamellic Haplorthods, sandy	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
231D: Lamellic Haplorthods, sandy	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
231E: Lamellic Haplorthods, sandy	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
232B: Entic Haplorthods, sandy, very deep water table-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Alfic Haplorthods, sandy, very deep water table-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
232D: Entic Haplorthods, sandy, very deep water table-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy, very deep water table-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
233B: Alfic Haplorthods, sandy-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
233C: Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
233D: Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
233E: Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Entic Haplorthods, sandy, fine-loamy banded substratum--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
234B: Lamellic Oxyaquic Haplorthods, sandy	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
235B: Alfic Haplorthods, sandy over loamy---	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: droughty.	Very limited: cutbanks cave
Alfic Haplorthods, sandy-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
235C: Alfic Haplorthods, sandy over loamy---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
235D: Alfic Haplorthods, sandy over loamy---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
235D: Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
235E: Alfic Haplorthods, sandy over loamy---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Alfic Haplorthods, sandy-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
236B: Arenic Hapludalfs---	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited:	Very limited: cutbanks cave.
236C: Arenic Hapludalfs---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope.	Very limited: cutbanks cave, slope.
236D: Arenic Hapludalfs---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope.	Very limited: slope, cutbanks cave.
236E: Arenic Hapludalfs---	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope.	Very limited: slope, cutbanks cave.
237B: Glossudalfs, loamy--	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: water erosion.	Very limited: cutbanks cave.
237C: Glossudalfs, loamy--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
237D: Glossudalfs, loamy--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
237E: Glossudalfs, loamy--	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
247B: Glennie-----	Not limited-----	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, restricted permeability, droughty.	Very limited: cutbanks cave, depth to saturated zone.
Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
247C: Glennie-----	Not limited-----	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, restricted permeability, slope.	Very limited: cutbanks cave, depth to saturated zone.
Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
250D: Glossudalfs-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
Haplosaprists, euic	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
252A: Haplosaprists, euic	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
254A: Haplosaprists, euic	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Fluvaquents-----	Very limited: seepage.	Very limited: ponding, depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: ponding, depth to saturated zone, cutbanks cave.
Aquic Udipsamments--	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
262A: Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
264A: Allendale-----	Very limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, droughty.	Very limited: depth to saturated zone, cutbanks cave.
265B: Glossudalfs-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: water erosion.	Very limited: cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
265B: Allendale-----	Very limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, droughty.	Very limited: depth to saturated zone, cutbanks cave.
272: Endoaquods-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Fluvaquents, occasionally flooded-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
273: Leafriver-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Wakeley-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
274: Typic Endoaquods, wet-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
280: Aquents-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Histosols-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: ponding, depth to saturated zone, frost action.
281: Haplosaprists, dysic	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Somewhat limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, content of organic matter, frost action.
282: Haplosaprists, euic	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave, frost action.
307B: Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
307E: Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
338B: Islandlake-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave
338E: Islandlake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
352B: Deford-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
Croswell-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave, depth to water.	Somewhat limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
360: Wakeley-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
362B: Millersburg-----	Somewhat limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: water erosion.	Very limited: cutbanks cave.
362D: Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
362E: Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
368A: Au Gres-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
368A: Deford-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
369: Deford-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, droughty.	Very limited: depth to saturated zone, cutbanks cave.
371: Springport-----	Not limited-----	Very limited: depth to saturated zone, ponding, hard to pack.	Very limited: depth to water.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
380. Access denied					
384B: Iosco-----	Very limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
388B: Millersburg-----	Somewhat limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: water erosion.	Very limited: cutbanks cave.
Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty, slope.	Very limited: cutbanks cave,
388D: Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
388D: Klackung-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
388E: Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
Klackung-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
390B: Horsehead-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
390D: Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
390E: Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
390E: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
390F: Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
391B: Horsehead-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
393B: Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
393C: Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
399D: Menominee-----	Very limited: seepage, slope.	Not limited-----	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
Bamfield, sandy substratum-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage, piping.	Very limited: depth to water.	Very limited: slope, water erosion, restricted permeability.	Very limited: slope, cutbanks cave.
Blue Lake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
400F:					
Menominee-----	Very limited: seepage, slope.	Not limited-----	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
Bamfield, sandy substratum-----	Somewhat limited: slope, seepage.	Somewhat limited: seepage, piping.	Very limited: depth to water.	Very limited: slope, water erosion, restricted permeability.	Very limited: slope, cutbanks cave.
Blue Lake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
424B:					
Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
Ossineke, sandy substratum-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, seepage, piping.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Blue Lake-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
424C:					
Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Ossineke, sandy substratum-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, seepage, piping.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
424C: Blue Lake-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
426B: Coppler-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
441B: Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
Nester-----	Not limited-----	Very limited: depth to saturated zone.	Very limited: depth to water.	Somewhat limited: restricted permeability, water erosion, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
441C: Morganlake-----	Very limited: seepage.	Very limited: piping, depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
Nester-----	Not limited-----	Very limited: depth to saturated zone.	Very limited: depth to water.	Very limited: slope, restricted permeability, water erosion.	Very limited: depth to saturated zone, cutbanks cave.
452D: Bamfield, sandy substratum-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage, piping.	Very limited: depth to water.	Very limited: slope, water erosion, restricted permeability.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
475B: Graycalm-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
475D: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
475E: Graycalm-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
476B: Klacking-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Perecheney-----	Very limited: seepage.	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Somewhat limited: depth to saturated zone.	Very limited: cutbanks cave, depth to saturated zone.
476D: Klacking-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Perecheney-----	Very limited: seepage.	Somewhat limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: slope, depth to saturated zone.	Very limited: cutbanks cave, depth to saturated zone.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
488A: Allendale-----	Very limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: depth to saturated zone, restricted permeability, droughty.	Very limited: depth to saturated zone, cutbanks cave.
496B: Gerrish-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Grayling-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
503D: Bamfield, sandy substratum-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage, piping.	Very limited: depth to water.	Very limited: water erosion, slope, restricted permeability.	Very limited: cutbanks cave, slope.
Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: cutbanks cave, slope.
Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
503E: Bamfield, sandy substratum-----	Somewhat limited: slope, seepage.	Somewhat limited: seepage, piping.	Very limited: depth to water.	Very limited: slope, water erosion, restricted permeability.	Very limited: slope, cutbanks cave.
Millersburg-----	Somewhat limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water erosion.	Very limited: slope, cutbanks cave.
Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
504B:					
Coppler-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Horsehead-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
504D:					
Coppler-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
504E:					
Coppler-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Horsehead-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
505B:					
Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, cutbanks cave.
Millersburg-----	Somewhat limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Slightly limited: water erosion.	Very limited: cutbanks cave.
Horsehead-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
505C:					
Ossineke-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
505C: Millersburg-----	Somewhat limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, water	Very limited: cutbanks cave, slope.
Horsehead-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
506B: Durkeelake-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: depth to water.	Somewhat limited: depth to saturated zone, slope.	Very limited: depth to saturated zone, cutbanks cave.
506C: Durkeelake-----	Very limited: seepage.	Very limited: depth to saturated zone, seepage.	Very limited: depth to water.	Very limited: slope, depth to saturated zone.	Very limited: depth to saturated zone, cutbanks cave.
507D: Islandlake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
508B: Islandlake-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
Blue Lake-----	Very limited: seepage.	Somewhat limited: seepage.	Very limited: depth to water.	Somewhat limited: droughty.	Very limited: cutbanks cave.
508D: Islandlake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.
Blue Lake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: cutbanks cave, slope.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
508E: Islandlake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
Blue Lake-----	Very limited: seepage, slope.	Somewhat limited: seepage.	Very limited: depth to water.	Very limited: slope, droughty.	Very limited: slope, cutbanks cave.
509A: Colonville-----	Very limited: seepage.	Very limited: depth to saturated zone.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, water erosion.	Very limited: depth to saturated zone, cutbanks cave, frost action.
Thunderbay-----	Very limited: seepage.	Very limited: depth to saturated zone, ponding, seepage.	Very limited: cutbanks cave.	Very limited: depth to saturated zone, water erosion.	Very limited: depth to saturated zone, cutbanks cave, frost action.
510: Deerheart-----	Not limited-----	Very limited: depth to saturated zone, ponding, piping.	Somewhat limited: cutbanks cave, slow refill.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action.
511B: Parmalee-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, depth to saturated zone, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
511C: Parmalee-----	Somewhat limited: seepage.	Very limited: depth to saturated zone, piping.	Very limited: depth to water.	Very limited: water erosion, slope, depth to saturated zone.	Very limited: depth to saturated zone, frost action, cutbanks cave.

Table 17.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Grassed waterways	Drainage
512A: Algonquin-----	Not limited-----	Very limited: depth to saturated zone, hard to pack.	Very limited: depth to water.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
Springport-----	Not limited-----	Very limited: depth to saturated zone, ponding, hard to pack.	Very limited: depth to water.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.
513A: Bowers-----	Somewhat limited: seepage.	Very limited: depth to saturated zone.	Somewhat limited: slow refill, cutbanks cave.	Very limited: depth to saturated zone, water erosion, restricted permeability.	Very limited: depth to saturated zone, frost action, cutbanks cave.

Table 18.--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	
13:												
Tawas-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-15	Muck	PT	A-8	0	0	---	---	---	---	---	---
	15-24	Muck	PT	A-8	0	0	---	---	---	---	---	---
	24-30	Mucky sand, gravelly sand	SM, SP, SP-SM	A-4, A-3, A- 2-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-55	Sand, gravelly sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3, A-4	0	0	95-100	92-100	35-70	0-40	0-14	NP
	55-80	Gravelly sand, sand	SP, SP-SM, SM	A-2-4, A-4, A-3, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
Lupton-----	0-4	Muck	PT	A-8	0	0	---	---	---	---	---	---
	4-55	Muck	PT	A-8	0	0	---	---	---	---	---	---
	55-80	Muck	PT	A-8	0	0	---	---	---	---	---	---
14:												
Dawson-----	0-4	Peat	PT	A-8	0	0	---	---	---	---	---	---
	4-9	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	9-32	Muck	PT	A-8	0	0	---	---	---	---	---	---
	32-80	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	90-100	75-100	40-70	0-15	0-14	NP
Loxley-----	0-6	Peat	PT	A-8	0	0	---	---	---	---	---	---
	6-43	Muck	PT	A-8	0	0	---	---	---	---	---	---
	43-80	Muck	PT	A-8	0	0	---	---	---	---	---	---
15A:												
Croswell-----	0-2	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-75	3-15	0-14	NP
	8-12	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	12-19	Sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	19-33	Sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	33-80	Sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
15A: Au Gres-----	0-4	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
16B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP-SM, SP	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
16C: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP-SM, SP	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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	
16D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP, SP-SM, SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
17A: Crowell-----	0-2	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-15	0-14	NP
	8-12	Sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	12-19	Sand	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	19-33	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	33-80	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
17B: Crowell-----	0-2	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-75	3-15	0-14	NP
	8-12	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	12-19	Sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	19-33	Sand	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	33-80	Sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
18A: Au Gres-----	0-4	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
19: Leafriver-----	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-20	Sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	45-70	3-35	0-14	NP
	20-40	Sand	SP-SM, SM, SP	A-2, A-2-4, A-3	0	0	95-100	90-100	45-70	3-35	0-14	NP
	40-80	Sand	SP-SM, SM, SP	A-3, A-2-4, A-2	0	0	95-100	90-100	45-70	3-35	0-14	NP
20B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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	
20D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-2-4, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
20F: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SM, SP	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-2-4, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SP, SM, SP-SM	A-2, A-1, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
21D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Loamy sand	SM, SP-SM	A-2-4, A-1	0	0-5	90-100	85-100	35-75	10-30	0-14	NP
	3-13	Sand, loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	13-21	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	21-39	Sand, loamy sand, sandy loam	SP-SM, SP, SM, SC-SM	A-2-4, A-3, A-1, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	39-46	Sandy loam, sand, loamy sand	SP-SM, SP, SM, SC-SM	A-4, A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	46-80	Sand, loamy sand, sandy loam	SC-SM, SP-SM, SP, SM	A-3, A-2-4, A-1, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
23: Ausable-----	0-11	Muck	PT	A-8	0	0	---	---	---	---	---	---
	11-16	Sand	SM, SP-SM	A-2-4, A-3	0	0-15	95-100	85-100	50-75	5-30	0-14	NP
	16-23	Sand, stratified sand to muck, loamy sand	SP-SM, SM, SP	A-1, A-2-4, A-3	0	0-15	80-100	70-100	35-75	0-30	0-14	NP
	23-48	Sand, stratified sand to muck, loamy sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	80-100	70-100	35-75	0-30	0-14	NP
	48-80	Sand, stratified sand to muck, loamy sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	80-100	70-100	35-75	0-30	0-14	NP

Table 18.--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	
23: Bowstring-----	0-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-32	Muck	PT	A-8	0	0	---	---	---	---	---	---
	32-47	Stratified sand to muck, fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	100	50-80	5-30	0-14	NP
	47-74	Muck	PT	A-8	0	0	---	---	---	---	---	---
	74-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	0	100	100	50-80	5-30	0-14	NP
24A: Kinross-----	0-3	Muck	PT	A-8	0	0	---	---	---	---	---	---
	3-10	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	100	100	35-75	0-15	0-14	NP
	10-14	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	100	100	35-70	0-15	0-14	NP
	14-22	Sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	100	100	40-70	3-15	0-14	NP
	22-80	Sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	100	100	40-70	3-15	0-14	NP
Au Gres-----	0-4	Sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
26B: Cublake-----	0-3	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	90-100	40-70	0-25	0-14	NP
	3-5	Sand	SP, SP-SM, SM	A-3, A-1-b, A-2-4	0	0	90-100	90-100	40-70	0-25	0-14	NP
	5-10	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	90-100	40-70	0-25	0-14	NP
	10-24	Sand	SP, SM, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	90-100	40-70	0-25	0-14	NP
	24-45	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	90-100	40-70	0-25	0-14	NP
	45-80	Stratified very fine sandy loam to silt loam	SC-SM, SC, CL, CL-ML	A-6, A-2, A-4	0	0	90-100	90-100	65-95	25-90	20-40	NP-20
27A: Tacoda-----	0-3	Sand	SM, SP, SP-SM	A-3, A-2, A- 2-4	0	0	90-100	85-100	35-70	0-15	0-14	NP
	3-15	Sand	SP-SM, SM	A-2, A-3	0	0	90-100	85-100	35-70	0-15	0-14	NP
	15-23	Sand	SP-SM, SM	A-3, A-2	0	0	90-100	85-100	35-70	0-15	0-14	NP
	23-35	Sand	SP-SM, SM	A-3, A-2	0	0	90-100	85-100	35-70	0-15	0-14	NP
	35-45	Sand	SP-SM, SM	A-3, A-2	0	0	90-100	85-100	35-70	0-15	0-14	NP
	45-80	Silty clay, clay	CL, CH	A-7	0	0	98-100	97-100	90-100	75-95	45-60	30-40
31B: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Loamy sand	SM, SP-SM	A-2-4, A-1	0	0-5	90-100	85-100	35-75	10-30	0-14	NP
	3-13	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	13-21	Sand, loamy sand	SP-SM, SM, SP	A-1, A-2-4, A-3	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	21-39	Sand, loamy sand, sandy loam	SP, SC-SM, SM, SP-SM	A-1, A-2-4, A-3, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	39-46	Sandy loam, sand, loamy sand	SP, SM, SP- SM, SC-SM	A-3, A-1, A- 2-4, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	46-80	Sand, loamy sand, sandy loam	SP-SM, SP, SM, SC-SM	A-1, A-2-4, A-3, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7

Table 18.--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	
31C: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Loamy sand	SP-SM, SM	A-1, A-2-4	0	0-5	90-100	85-100	35-75	10-30	0-14	NP
	3-13	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	13-21	Sand, loamy sand	SP, SM, SP-SM	A-1, A-2-4, A-3	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	21-39	Sand, loamy sand, sandy loam	SP-SM, SC-SM, SM, SP	A-1, A-2-4, A-3, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	39-46	Sandy loam, sand, loamy sand	SP-SM, SP, SM, SC-SM	A-4, A-2-4, A-1, A-3	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	46-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM, SC-SM	A-4, A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
31D: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Loamy sand	SP-SM, SM	A-1, A-2-4	0	0-5	90-100	85-100	35-75	10-30	0-14	NP
	3-13	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	13-21	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A-2-4	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	21-39	Sand, loamy sand, sandy loam	SM, SP, SP-SM, SC-SM	A-4, A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	39-46	Sandy loam, sand, loamy sand	SC-SM, SP-SM, SP, SM	A-2-4, A-1, A-3, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	46-80	Sand, loamy sand, sandy loam	SC-SM, SP-SM, SP, SM	A-3, A-4, A-2-4, A-1	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7

Table 18.--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	
32B: Kellogg-----	0-8	Sand	SM, SP-SM	A-1-b, A-3, A-2-4	0	0-5	90-100	85-100	40-70	5-15	0-14	NP
	8-13	Sand, loamy sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-14	NP
	13-17	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-26	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	26-28	Clay loam, sandy loam, loamy sand, sand, silty clay loam, clay	SC, ML, CL, SM	A-6, A-2-4, A-4	0	0-8	95-100	75-100	45-90	20-60	0-30	NP-40
	28-34	Silty clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	34-46	Silty clay loam, silty clay, clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	46-80	Clay, silty clay loam, silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40

Table 18.--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	
32C: Kellogg-----	0-8	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-70	5-15	0-14	NP
	8-13	Sand, loamy sand	SM, SP-SM	A-1-b, A-3, A-2-4	0	0-5	90-100	85-100	40-75	5-30	0-14	NP
	13-17	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-26	Sand, loamy sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	26-28	Clay loam, sandy loam, loamy sand, sand, silty clay loam, clay	SM, SC, ML, CL	A-6, A-2-4, A-4	0	0-8	95-100	75-100	45-90	20-60	0-30	NP-40
	28-34	Silty clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	34-46	Silty clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	46-80	Silty clay loam, clay, silty clay	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40

Table 18.--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	
36B: Annalake-----	0-1	Loamy very fine sand, very fine sandy loam, fine sandy loam	ML, SC-SM, SM	A-4, A-2-4	0	0	95-100	92-100	50-95	25-65	0-14	NP
	1-3	Loamy very fine sand, very fine sandy loam, fine sandy loam	SM	A-2-4	0	0	95-100	92-100	50-90	15-65	0-14	NP
	3-8	Loamy very fine sand, very fine sandy loam, fine sandy loam, loamy fine sand	SM	A-2-4	0	0	95-100	92-100	50-95	15-65	0-14	NP
	8-12	Loamy very fine sand, very fine sandy loam, fine sandy loam, loamy fine sand	SM	A-2-4	0	0	95-100	92-100	50-95	15-70	0-14	NP
	12-16	Loamy very fine sand, very fine sandy loam, fine sandy loam, loamy fine sand	SM, SC, ML, CL	A-2, A-4	0	0	95-100	92-100	60-90	20-70	15-30	NP-8
	16-21	Loam, very fine sandy loam, fine sandy loam, loamy fine sand, loamy very fine sand	ML, SC, SM, CL	A-4, A-2	0	0	95-100	92-100	60-90	20-70	15-30	NP-8
	21-41	Loam, very fine sandy loam, fine sandy loam	ML, SM, CL, SC	A-4, A-2-4	0	0	95-100	92-100	50-95	25-80	18-28	3-9
	41-80	Loamy very fine sand	SC-SM, SM	A-2-4	0	0	95-100	92-100	50-95	25-80	0-14	NP-8

Table 18.--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	
37A: Richter-----	0-8	Loamy fine sand	SM, SP-SM	A-1, A-2-4	0	0	95-100	92-100	45-80	10-35	0-14	NP
	8-12	Loamy sand, very fine sandy loam	SC-SM, SC, SM	A-1, A-2-4, A-4	0	0	95-100	92-100	45-90	15-45	0-25	NP-10
	12-18	Loamy sand, sandy loam	SC-SM, SC, SM	A-2-4, A-4, A-1	0	0	95-100	92-100	45-90	15-45	0-25	NP-10
	18-26	Sandy loam, loamy sand, fine sandy loam, very fine sandy loam	SC, SC-SM, SM	A-1, A-2-4, A-4	0	0	95-100	92-100	45-90	15-45	10-25	NP-10
	26-37	Stratified fine sandy loam to clay loam	SM, SC, SC-SM	A-4, A-2-4, A-1	0	0	95-100	92-100	45-80	15-45	10-25	NP-10
	37-60	Stratified loamy sand to silt loam	SC-SM, SC, SM	A-1, A-2-4, A-4	0	0	95-100	92-100	45-80	15-45	10-25	NP-10
41C: McGinn-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	2-4	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	4-16	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	16-18	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	18-21	Loamy sand, sandy loam, loam	ML, SC-SM, SM, SP-SM	A-4, A-2-4, A-1-b	0	0-8	90-100	85-100	35-95	10-60	15-25	NP-15
	21-25	Sandy loam, loamy sand, loam	SC-SM, SP-SM, SM, ML	A-4, A-2-4, A-1-b	0	0-8	90-100	85-100	35-95	10-60	15-25	NP-15
	25-35	Sandy loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-4, A- 2-4	0	0-8	90-100	85-100	45-95	20-60	25-30	5-15
	35-80	Sandy loam	SM, SC-SM	A-2-4, A-4, A-1-b	0	0-8	90-100	85-100	45-80	20-50	15-25	NP-10

Table 18.--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	
44B: Ossineke-----	0-9	Fine sandy loam	SC, SM, SC-SM	A-4, A-6, A- 2-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	CL, SC-SM	A-4, A-2, A-6	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	CL, SC-SM	A-2, A-4, A-6	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	CL, SC-SM	A-6, A-4, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25

Table 18.--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	
44C: Ossineke-----	0-9	Fine sandy loam	SC-SM, SC, SM	A-6, A-4, A-2-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	SC-SM, CL	A-2, A-4, A-6	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	CL, SC-SM	A-2, A-4, A-6	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	CL, SC-SM	A-6, A-4, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
47D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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	
47F: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SM, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
50B: Au Gres-----	0-4	Sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SM, SP-SM, SP	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
Kinross-----	0-3	Muck	PT	A-8	0	0	---	---	---	---	---	---
	3-10	Sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	100	100	35-75	0-15	0-14	NP
	10-14	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	100	100	35-70	0-15	0-14	NP
	14-22	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	100	100	40-70	3-15	0-14	NP
	22-80	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	100	100	40-70	3-15	0-14	NP

Table 18.--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		
50B: Crowell-----	In												
	0-2	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	5-15	0-14	NP	
	2-8	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-75	3-15	0-14	NP	
	8-12	Sand	SP, SP-SM, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP	
	12-19	Sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP	
	19-33	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP	
	33-80	Sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP	
51: Tawas-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---	
	7-15	Muck	PT	A-8	0	0	---	---	---	---	---	---	
	15-24	Muck	PT	A-8	0	0	---	---	---	---	---	---	
	24-30	Mucky sand, gravelly sand	SP, SM, SP-SM	A-2-4, A-3, A-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP	
	30-55	Sand, gravelly sand	SP-SM, SP, SM	A-2-4, A-3, A-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP	
	55-80	Gravelly sand, sand	SP, SP-SM, SM	A-1-b, A-4, A-3, A-2-4	0	0	95-100	92-100	35-70	0-40	0-14	NP	
Leafriver-----	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---	
	12-20	Sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	45-70	3-35	0-14	NP	
	20-40	Sand	SM, SP-SM, SP	A-2, A-2-4, A-3	0	0	95-100	90-100	45-70	3-35	0-14	NP	
	40-80	Sand	SP-SM, SP, SM	A-2, A-2-4, A-3	0	0	95-100	90-100	45-70	3-35	0-14	NP	
53B: Negwagon-----	0-10	Silt loam	CL-ML, CL	A-6, A-4	0	0	95-100	90-100	80-100	65-90	20-40	5-15	
	10-15	Silty clay loam, silt loam, silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40	
	15-23	Silty clay, silty clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40	
	23-34	Silty clay, silty clay loam, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40	
	34-80	Silty clay loam, silty clay	CL, CH	A-7	0	0	95-100	90-100	80-100	65-95	40-65	20-40	

Table 18.--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	
53C: Negwegon-----	0-10	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	65-90	20-40	5-15
	10-15	Silty clay loam, silt loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	15-23	Silty clay, silty clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	23-34	Silty clay, silty clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	34-80	Silty clay loam, silty clay	CH, CL	A-7	0	0	95-100	90-100	80-100	65-95	40-65	20-40
54A: Algonquin-----	0-6	Silt loam	CL	A-6, A-4	0	0	99-100	95-100	80-100	70-90	25-40	7-15
	6-15	Clay, silty clay loam, silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	15-18	Silty clay loam, clay, silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	18-35	Silty clay loam, silty clay, stratified silty clay loam to silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	35-80	Silty clay loam, silty clay, stratified silty clay loam to silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40

Table 18.--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	
56B: Nester-----	0-3	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	65-100	50-90	15-35	5-15
	3-6	Loam, sandy loam, clay loam	CL, ML, SC, SM	A-2-6, A-6, A-2-4, A-4	0	0-5	90-100	85-100	45-100	20-90	15-35	NP-15
	6-16	Clay loam, silty clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	16-34	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	34-41	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
	41-80	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
56C: Nester-----	0-3	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	65-100	50-90	15-35	5-15
	3-6	Loam, sandy loam, clay loam	CL, ML, SC, SM	A-6, A-4, A- 2-6, A-2-4	0	0-5	90-100	85-100	45-100	20-90	15-35	NP-15
	6-16	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	16-34	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	34-41	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
	41-80	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
57B: Kawkawlin-----	0-10	Loam	CL-ML, ML, CL	A-6, A-4	0	0-5	95-100	85-100	70-95	50-75	20-40	2-15
	10-13	Clay loam, loam, clay	CH, CL	A-7-6	0	0-5	95-100	85-100	75-100	55-95	40-55	20-30
	13-16	Clay loam, clay	CH, CL	A-7-6	0	0-5	95-100	85-100	75-100	55-95	40-55	20-30
	16-30	Clay loam	CL	A-7-6, A-6	0	0-5	95-100	85-100	75-100	50-95	35-50	15-25
	30-60	Clay loam	CL	A-7-6, A-6	0	0-5	95-100	85-100	75-100	50-95	35-50	15-25

Table 18.--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	
58A: Wakeley-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-22	Sand	SM, SC-SM, SP-SM, SP	A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	22-29	Clay, silty clay loam, sandy clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	29-80	Silty clay, silty clay loam, sandy clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
Allendale-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-5	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	5-10	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-17	Sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-40	Clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-63	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	63-80	Silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
67A: Bowers-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	25-40	7-16
	8-11	Silty clay loam, sandy loam, loam, clay loam	CL, SC-SM	A-7, A-4	0	0	100	100	90-100	70-95	25-50	7-25
	11-25	Silty clay loam, clay loam	CL	A-7, A-6	0	0	100	100	90-100	70-95	40-50	9-25
	25-45	Silty clay loam, clay loam	CL	A-7, A-6	0	0	100	100	90-100	70-95	40-50	9-25
	45-80	Stratified silty clay loam to silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	35-50	9-25

Table 18.--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	
67A:												
Deerheart-----	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	65-90	25-35	5-15
	6-27	Silty clay loam, clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	65-95	35-50	15-25
	27-43	Silty clay loam, clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	65-95	35-50	15-25
	43-80	Stratified silty clay loam to very fine sandy loam to silt to silt loam	CL, CL-ML	A-7, A-4, A-6	0	0	95-100	90-100	75-100	50-95	25-50	5-25
70:												
Lupton-----	0-4	Muck	PT	A-8	0	0	---	---	---	---	---	---
	4-55	Muck	PT	A-8	0	0	---	---	---	---	---	---
	55-80	Muck	PT	A-8	0	0	---	---	---	---	---	---
71:												
Tawas-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-15	Muck	PT	A-8	0	0	---	---	---	---	---	---
	15-24	Muck	PT	A-8	0	0	---	---	---	---	---	---
	24-30	Mucky sand, gravelly sand	SM, SP-SM, SP	A-1-b, A-2-4, A-4, A-3	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-55	Sand, gravelly sand	SP-SM, SP, SM	A-4, A-3, A- 2-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
	55-80	Gravelly sand, sand	SP, SP-SM, SM	A-4, A-2-4, A- 1-b, A-3	0	0	95-100	92-100	35-70	0-40	0-14	NP
75B:												
Rubicon-----	0-4	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	92-100	35-70	0-15	0-14	NP
	4-9	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	92-100	35-70	0-15	0-14	NP
	9-16	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	0	95-100	92-100	35-70	0-15	0-14	NP
	16-22	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	92-100	35-70	0-15	0-14	NP
	22-47	Sand	SP-SM, SP, SM	A-3, A-2, A- 1-b	0	0	95-100	92-100	30-70	0-15	0-14	NP
	47-80	Sand	SP-SM, SP, SM	A-1-b, A-2, A-3	0	0	95-100	92-100	30-70	0-15	0-14	NP

Table 18.--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:												
Rubicon-----	0-4	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	92-100	35-70	0-15	0-14	NP
	4-9	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	92-100	35-70	0-15	0-14	NP
	9-16	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	95-100	92-100	35-70	0-15	0-14	NP
	16-22	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	92-100	35-70	0-15	0-14	NP
	22-47	Sand	SM, SP, SP-SM	A-1-b, A-2, A-3	0	0	95-100	92-100	30-70	0-15	0-14	NP
	47-80	Sand	SM, SP, SP-SM	A-1-b, A-3, A-2	0	0	95-100	92-100	30-70	0-15	0-14	NP
78.												
Pits, borrow												
81B:												
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
81D:												
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
81E:												
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SM, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP, SP-SM, SM	A-3, A-1, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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	
81F: Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP, SP-SM, SM	A-1, A-3, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP-SM, SP, SM	A-1, A-3, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
82B: Udorthents-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
83B: Udipsamments----	0-7	Sand	SP, SM, SP-SM	A-3, A-2-4, A-1	0	0	85-100	85-100	30-75	0-25	0-14	NP
	7-13	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0	85-100	85-100	30-75	0-25	0-14	NP
	13-65	Sand	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0	85-100	85-100	30-75	0-25	0-14	NP
	65-80	Sand	SM, SP-SM, SP	A-2-4, A-1, A-3	0	0	85-100	85-100	30-75	0-25	0-14	NP
86: Histosols-----	0-14	Muck	PT	A-8	0	0	---	---	---	---	---	---
	14-80	Muck	PT	A-8	---	---	---	---	---	---	---	---
Aquents-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
87: Ausable-----	0-11	Muck	PT	A-8	0	0	---	---	---	---	---	---
	11-16	Sand	SP-SM, SM	A-2-4, A-3	0	0-15	95-100	85-100	50-75	5-30	0-14	NP
	16-23	Sand, stratified sand to muck, loamy sand	SM, SP-SM, SP	A-3, A-2-4, A-1	0	0-15	80-100	70-100	35-75	0-30	0-14	NP
	23-48	Stratified sand to muck, sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1	0	0-15	80-100	70-100	35-75	0-30	0-14	NP
	48-80	Stratified sand to muck, sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A- 2-4	0	0-15	80-100	70-100	35-75	0-30	0-14	NP

Table 18.--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	
90B: Chinwhisker-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-5	Sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0	95-100	85-100	35-70	0-25	0-14	NP
	5-10	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-25	0-14	NP
	10-21	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-25	0-14	NP
	21-29	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	29-80	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-25	0-14	NP
93B: Tacoda-----	0-3	Sand	SP-SM, SM, SP	A-2-4, A-3, A-2	0	0	90-100	85-100	35-70	0-15	0-14	NP
	3-15	Sand	SP-SM, SM	A-3, A-2	0	0	90-100	85-100	35-70	0-15	0-14	NP
	15-23	Sand	SP-SM, SM	A-2, A-3	0	0	90-100	85-100	35-70	0-15	0-14	NP
	23-35	Sand	SP-SM, SM	A-2, A-3	0	0	90-100	85-100	35-70	0-15	0-14	NP
	35-45	Sand	SM, SP-SM	A-2, A-3	0	0	90-100	85-100	35-70	0-15	0-14	NP
	45-80	Silty clay, clay	CH, CL	A-7	0	0	98-100	97-100	90-100	75-95	45-60	30-40
Wakeley-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-22	Sand	SC-SM, SP-SM, SM, SP	A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	22-29	Clay, silty clay loam, sandy clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	29-80	Silty clay, silty clay loam, sandy clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40

Table 18.--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	
94F: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Loamy sand	SM, SP-SM	A-1, A-2-4	0	0-5	90-100	85-100	35-75	10-30	0-14	NP
	3-13	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	13-21	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	90-100	85-100	35-75	0-30	0-14	NP
	21-39	Sand, loamy sand, sandy loam	SP, SM, SC- SM, SP-SM	A-4, A-2-4, A-1, A-3	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	39-46	Sandy loam, sand, loamy sand	SM, SC-SM, SP, SP-SM	A-1, A-2-4, A-3, A-4	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
	46-80	Sand, loamy sand, sandy loam	SM, SP, SP- SM, SC-SM	A-4, A-1, A- 2-4, A-3	0	0-5	90-100	85-100	35-70	0-40	0-25	NP-7
McGinn-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	2-4	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	4-16	Loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	16-18	Loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	90-100	85-100	35-75	10-30	0-14	NP
	18-21	Loamy sand, sandy loam, loam	ML, SC-SM, SM, SP-SM	A-4, A-2-4, A-1-b	0	0-8	90-100	85-100	35-95	10-60	15-25	NP-15
	21-25	Sandy loam, loamy sand, loam	SC-SM, SM, SP-SM, ML	A-1-b, A-2-4, A-4	0	0-8	90-100	85-100	35-95	10-60	15-25	NP-15
	25-35	Sandy loam, loam	CL, SC, SC- SM, CL-ML	A-2-4, A-4, A-6	0	0-8	90-100	85-100	45-95	20-60	25-30	5-15
	35-80	Sandy loam	SC-SM, SM	A-1-b, A-2-4, A-4	0	0-8	90-100	85-100	45-80	20-50	15-25	NP-10

Table 18.--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	
96D2: Mongo-----	0-6	Silty clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	75-95	35-50	15-25
	6-10	Silty clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	10-40	Silty clay, silty clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-80	Stratified silty clay loam to silt loam	CH, CL	A-7	0	0	95-100	90-100	80-100	65-95	40-65	20-40
98C: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-2-4, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
110D: Mongo-----	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	60-75	20-40	5-15
	7-16	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	16-23	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	23-44	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	44-80	Clay, silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	40-65	20-40

Table 18.--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	
110F: Mongo-----	0-7	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-75	20-40	5-15
	7-16	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	16-23	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	23-44	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	95-100	85-95	40-65	20-40
	44-80	Clay, silty clay	CL, CH	A-7	0	0	100	100	95-100	85-95	40-65	20-40
111B: Kellogg-----	0-4	Loamy sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-14	NP
	4-6	Sand, loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	90-100	85-100	40-75	5-30	0-14	NP
	6-17	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-24	Sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	24-27	Clay, sandy loam, loamy sand, sand, silty clay loam	CL, ML, SC, SM	A-6, A-2-4, A-4	0	0-8	95-100	75-100	45-90	20-60	0-30	NP-40
	27-32	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	32-50	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	50-80	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40

Table 18.--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	
111C: Kellogg-----	0-4	Loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0-5	90-100	85-100	40-70	5-15	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0-5	90-100	85-100	40-75	5-30	0-14	NP
	6-17	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-24	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	24-27	Clay, sandy loam, loamy sand, sand, silty clay loam	SM, ML, CL, SC	A-4, A-6, A- 2-4	0	0-8	95-100	75-100	45-90	20-60	0-30	NP-40
	27-32	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	32-50	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40
	50-80	Clay, silty clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	40-65	20-40

Table 18.--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	
116B: Mancelona-----	0-3	Sand	SP-SM, SM, SP	A-2, A-3, A-1-b	0	0-15	90-100	80-100	35-70	0-15	0-14	NP
	3-6	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-1-b, A-3, A-2	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	6-16	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-3, A-2, A-1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	16-20	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-2, A-3, A-1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	20-29	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-2, A-3, A-1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	29-35	Gravelly sandy loam, sandy clay loam, gravelly sandy clay loam, gravelly loamy sand, loamy sand	SC, SP-SC, SC-SM	A-4, A-6, A-1, A-2	0-5	0-15	85-100	60-100	35-80	10-50	20-35	4-15
	35-80	Very gravelly sand, gravelly sand, sand	SP, GP, GW, SW	A-3, A-2, A-1	0-5	0-15	40-90	35-70	20-60	0-15	0-14	NP

Table 18.--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	
116C: Mancelona-----	0-3	Sand	SP-SM, SM, SP	A-2, A-1-b, A-3	0	0-15	90-100	80-100	35-70	0-15	0-14	NP
	3-6	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-1-b, A-2, A-3	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	6-16	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-3, A-1-b, A-2	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	16-20	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-3, A-1-b, A-2	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	20-29	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-3, A-1-b, A-2	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	29-35	Gravelly sandy loam, sandy clay loam, gravelly sandy clay loam, gravelly loamy sand, loamy sand	SC, SC-SM, SP-SC	A-6, A-4, A- 2, A-1	0-5	0-15	85-100	60-100	35-80	10-50	20-35	4-15
	35-80	Very gravelly sand, gravelly sand, sand	SW, SP, GW, GP	A-3, A-2, A-1	0-5	0-15	40-90	35-70	20-60	0-15	0-14	NP

Table 18.--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	
116D: Mancelona-----	0-3	Sand	SP-SM, SM, SP	A-3, A-1-b, A-2	0	0-15	90-100	80-100	35-70	0-15	0-14	NP
	3-6	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-3, A-2, A- 1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	6-16	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-1-b, A-3, A-2	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	16-20	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-2, A-1-b, A-3	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	20-29	Sand, loamy sand, gravelly loamy sand, gravelly sand	SM, SP-SM	A-1-b, A-2, A-3	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	29-35	Gravelly sandy loam, sandy clay loam, gravelly sandy clay loam, gravelly loamy sand, loamy sand	SC, SC-SM, SP-SC	A-4, A-6, A- 1, A-2	0-5	0-15	85-100	60-100	35-80	10-50	20-35	4-15
	35-80	Very gravelly sand, gravelly sand, sand	GP, SW, SP, GW	A-3, A-1, A-2	0-5	0-15	40-90	35-70	20-60	0-15	0-14	NP

Table 18.--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	
116E: Mancelona-----	0-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1-b	0	0-15	90-100	80-100	35-70	0-15	0-14	NP
	3-6	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-3, A-2, A-1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	6-16	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-2, A-1-b, A-3	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	16-20	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-1-b, A-2, A-3	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	20-29	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM	A-3, A-2, A-1-b	0	0-15	80-100	60-100	30-75	5-30	0-14	NP
	29-35	Gravelly sandy loam, sandy clay loam, gravelly sandy clay loam, gravelly loamy sand, loamy sand	SC, SC-SM, SP-SC	A-2, A-1, A-4, A-6	0-5	0-15	85-100	60-100	35-80	10-50	20-35	4-15
	35-80	Very gravelly sand, gravelly sand, sand	SP, SW, GP, GW	A-1, A-2, A-3	0-5	0-15	40-90	35-70	20-60	0-15	0-14	NP

Table 18.--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	
123D: Klackung-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-1, A-3, A-2	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SP-SM, SC-SM, SM, SP	A-2-4, A-3, A-4, A-1	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SM, SP	A-2-4, A-3, A-2	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
125B: Melita-----	0-4	Sand	SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	92-100	45-80	5-35	0-14	NP
	4-8	Sand	SM, SP-SM	A-2, A-3, A-1	0	0-5	95-100	92-100	45-80	5-35	0-14	NP
	8-16	Sand, loamy sand	SM, SP-SM	A-2, A-3, A-1	0	0-5	95-100	92-100	45-80	5-35	0-14	NP
	16-43	Sand, loamy sand	SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	92-100	45-80	5-35	0-14	NP
	43-47	Silty clay loam, loam, clay loam	CL, CL-ML	A-7, A-6, A-4	0	0-5	95-100	92-100	75-100	55-95	25-45	4-25
	47-80	Sandy clay loam, clay loam, silty clay loam, loam, sandy loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	92-100	75-100	55-95	25-40	4-25

Table 18.--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	
144B: Perecheney-----	0-2	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM	A-1-b, A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP
	7-12	Sand, loamy sand, loamy fine sand	SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP
	12-21	Sand, loamy sand, loamy fine sand	SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP
	21-28	Loamy sand, loamy sand, loamy fine sand	SP-SM	A-4, A-2-4	0	0	95-100	85-100	55-95	5-40	0-14	NP
	28-42	Loam, sandy clay loam, sandy loam, sand	CL, CL-ML, SC	A-4, A-6	0	0	95-100	85-100	55-95	40-80	10-40	NP-20
	42-44	Loamy sand, sandy loam, very fine sandy loam, sand	CL-ML, SC, CL	A-4, A-6	0	0	95-100	85-100	55-95	40-80	10-30	NP-20
	44-80	Sand, loamy sand	SP-SM, SC-SM, SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	40-75	5-30	0-14	NP

Table 18.--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	
144C: Perecheney-----	0-2	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	40-70	5-15	0-14	NP
	7-12	Sand, loamy sand, loamy fine sand	SM	A-1-b, A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP
	12-21	Sand, loamy sand, loamy fine sand	SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	40-70	5-15	0-14	NP
	21-28	Loamy sand, loamy sand, loamy fine sand	SP-SM	A-2-4, A-4	0	0	95-100	85-100	55-95	5-40	0-14	NP
	28-42	Loam, sandy clay loam, sandy loam, sand	CL, SC, CL-ML	A-6, A-4	0	0	95-100	85-100	55-95	40-80	10-40	NP-20
	42-44	Loamy sand, sandy loam, very fine sandy loam, sand	CL, SC, CL-ML	A-6, A-4	0	0	95-100	85-100	55-95	40-80	10-30	NP-20
	44-80	Sand, loamy sand	SC-SM, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	40-75	5-30	0-14	NP
200. Borrow source												
210B: Grayling-----	0-4	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SP-SM, SM, SP	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
210C: Grayling-----	0-4	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP

Table 18.--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	
210D:												
Grayling-----	0-4	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SP-SM, SM, SP	A-2, A-3, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
210E:												
Grayling-----	0-4	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SP, SM, SP-SM	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
211B:												
Grayling, banded substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-28	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	28-81	Sand	SM, SP-SM, SP	A-3, A-1, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
	81-155	Sand, fine sand, coarse sand, loamy sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
	155-180	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SM, SP-SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-180	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-2-4, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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	
211C: Grayling, banded substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-28	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	28-81	Sand	SP, SM, SP-SM	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
	81-155	Sand, fine sand, coarse sand, loamy sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
	155-180	Sand	SP, SP-SM, SM	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM, SP	A-3, A-1, A-2	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-180	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-2-4, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
211D: Grayling, banded substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-28	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	28-81	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
	81-155	Sand, fine sand, coarse sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
	155-180	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP

Table 18.--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: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-180	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-2-4, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
211E: Grayling, banded substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-28	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	28-81	Sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
	81-155	Sand, fine sand, coarse sand, loamy sand	SP-SM, SM, SP	A-3, A-1, A- 2-4	0	0	95-100	90-100	40-70	0-15	0-14	NP
	155-180	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-180	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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			
212B: Grayling, very deep water table-----	In												
	0-4	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP	
	4-18	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP	
	18-26	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP	
	26-84	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP	
	84-168	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP	
213B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP	
	2-3	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	3-7	Sand	SP, SM, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	7-17	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	17-24	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	24-80	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10	
213C: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP	
	2-3	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	3-7	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	7-17	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	17-24	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP	
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-2-4, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10	

Table 18.--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	
213D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SM, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SM, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
214B: Oxyaquic Udipsamments---	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-5	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-15	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-25	Sand, loamy sand	SP-SM, SM, SP	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	25-34	Sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	34-43	Sand, coarse sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
	43-71	Coarse sand, sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	71-80	Sand, coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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: Typic Udipsamments, loamy substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-4	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	4-24	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-32	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-78	Sand, coarse sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	78-102	Clay loam	CL	A-6	0	0	90-100	80-85	75-85	50-70	30-45	10-25
215C: Typic Udipsamments, loamy substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-4	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	4-24	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-32	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-78	Sand, coarse sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	78-102	Clay loam	CL	A-6	0	0	90-100	80-85	75-85	50-70	30-45	10-25

Table 18.--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: Typic Udipsamments, loamy substratum-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-4	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	4-24	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-78	Sand, coarse sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	78-102	Clay loam	CL	A-6	0	0	90-100	80-85	75-85	50-70	30-45	10-25
220B: Typic Udipsamments---	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-23	Sand, loamy sand	SM, SP-SM, SP	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	23-41	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	41-180	Sand, coarse sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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	
220C: Typic Udipsamments---	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-23	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	23-41	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	41-180	Sand, coarse sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
220D: Typic Udipsamments---	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-23	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	23-41	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	41-180	Sand, coarse sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
220E: Typic Udipsamments---	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-23	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	23-41	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	41-180	Sand, coarse sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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	
221B: Typic Udipsamments, banded substratum-----	0-1	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-12	Sand, loamy sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	12-18	Sand, loamy sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	18-30	Sand, loamy sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	30-70	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	70-90	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	90-105	Sand, fine sandy loam	SP-SM, SP, SM	A-4, A-3, A-2	0	0	95-100	85-100	40-70	0-50	0-25	NP-10
	105-180	Sand	SP-SM, SM, SP	A-1, A-3, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
Lamellic Udipsamments---	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-12	Sand	SP-SM, SM, SP	A-3, A-1, A-2	0	0-5	95-100	75-100	35-55	0-15	0-14	NP
	12-27	Sand, fine sand	SP, SP-SM, SM	A-1, A-3, A-2	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	27-58	Sand, fine sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	58-180	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	75-100	30-75	0-30	0-14	NP

Table 18.--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	
221C: Typic Udipsamments, banded substratum-----	0-1	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-12	Sand, loamy sand	SP, SM, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	12-18	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	18-30	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	30-70	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	70-90	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
	90-105	Sand, fine sandy loam	SP, SM, SP-SM	A-3, A-2, A-4	0	0	95-100	85-100	40-70	0-50	0-25	NP-10
	105-180	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
Lamellic Udipsamments---	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-12	Sand	SP-SM, SM, SP	A-1, A-3, A-2	0	0-5	95-100	75-100	35-55	0-15	0-14	NP
	12-27	Sand, fine sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	27-58	Sand, fine sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	58-180	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-1, A-2, A-3	0	0-5	95-100	75-100	30-75	0-30	0-14	NP

Table 18.--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	
221D: Typic Udipsamments, banded substratum-----	0-1	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-12	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	12-18	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	18-30	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	30-70	Sand	SP, SP-SM, SM	A-3, A-1, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
	70-90	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
	90-105	Sand, fine sandy loam	SP-SM, SP, SM	A-2, A-4, A-3	0	0	95-100	85-100	40-70	0-50	0-25	NP-10
	105-180	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
Lamellic Udipsamments---	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-12	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	75-100	35-55	0-15	0-14	NP
	12-27	Sand, fine sand	SM, SP-SM, SP	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	27-58	Sand, fine sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	58-180	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-1, A-3, A-2	0	0-5	95-100	75-100	30-75	0-30	0-14	NP

Table 18.--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	
221E: Typic Udipsamments, banded substratum-----	0-1	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-12	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	12-18	Sand, loamy sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	18-30	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	30-70	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	70-90	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	90-105	Sand, fine sandy loam	SP-SM, SM, SP	A-3, A-2, A-4	0	0	95-100	85-100	40-70	0-50	0-25	NP-10
	105-180	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
Lamellic Udipsamments---	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-12	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	95-100	75-100	35-55	0-15	0-14	NP
	12-27	Sand, fine sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	27-58	Sand, fine sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	0-14	NP
	58-180	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	0-14	NP

Table 18.--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	
222B: Typic Udipsamments, very deep water table-----	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-70	3-15	0-14	NP
	3-5	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	5-23	Sand, loamy sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	45-70	3-15	0-14	NP
	23-41	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	85-100	40-70	0-15	0-14	NP
	41-180	Sand, coarse sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP
223B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-1, A-3, A- 2-4	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-4	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SM, SP-SM, SP	A-2, A-3, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP

Table 18.--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	
223C: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-4	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP
223D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SM, SP	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-4	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0	95-100	90-100	40-70	0-15	0-14	NP

Table 18.--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	
223E: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SM, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Grayling-----	0-4	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0	95-100	90-100	45-70	3-15	0-14	NP
	4-18	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0	95-100	90-100	45-70	3-15	0-14	NP
	18-26	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0	95-100	90-100	45-70	3-15	0-14	NP
	26-84	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
	84-168	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	40-70	0-15	0-14	NP
224B: Crowell-----	0-2	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-75	3-15	0-14	NP
	8-12	Sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	12-19	Sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	19-33	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	33-80	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
225B: Entic Haplorthods, sandy, loamy substratum-----	0-2	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-10	Sand, loamy sand, fine sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	10-26	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	26-32	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-76	Sand, coarse sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	76-148	Coarse sandy loam, sand, very fine sandy loam, sandy clay loam	SP, SP-SM, SC-SM	A-3, A-2-4, A-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-20
	148-180	Fine sand, loamy fine sand, clay loam	SP-SM, SP, SC-SM	A-3, A-4, A- 2-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-25

Table 18.--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	
225C: Entic Haplorthods, sandy, loamy substratum-----	0-2	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-10	Sand, loamy sand, fine sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	10-26	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	26-32	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-76	Sand, coarse sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	76-148	Coarse sandy loam, sand, very fine sandy loam, sandy clay loam	SC-SM, SP, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-20
	148-180	Fine sand, loamy fine sand, clay loam	SC-SM, SP, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-25

Table 18.--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	
225D: Entic Haplorthods, sandy, loamy substratum-----												
	0-2	Sand, fine sand, loamy sand	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-10	Sand, loamy sand, fine sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	10-26	Sand, loamy sand, fine sand	SP, SM, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	26-32	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-76	Sand, coarse sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	76-148	Coarse sandy loam, sand, very fine sandy loam, sandy clay loam	SC-SM, SP, SP-SM	A-3, A-2-4, A-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-20
	148-180	Fine sand, loamy fine sand, clay loam	SC-SM, SP, SP-SM	A-3, A-4, A- 2-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-25

Table 18.--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	
225E: Entic Haplorthods, sandy, loamy substratum-----	0-2	Sand, fine sand, loamy sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-10	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	10-26	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	26-32	Sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	32-76	Sand, coarse sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	76-148	Coarse sandy loam, sand, very fine sandy loam, sandy clay loam	SC-SM, SP, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-20
	148-180	Fine sand, loamy fine sand, clay loam	SP-SM, SP, SC-SM	A-3, A-2-4, A-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-25

Table 18.--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	
230C: Entic Haplorthods, sandy-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-7	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	95-100	85-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand, fine sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-23	Sand, loamy sand, fine sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	23-30	Sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	30-180	Sand, coarse sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
230D: Entic Haplorthods, sandy-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-7	Sand, fine sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-23	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	23-30	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	30-180	Sand, coarse sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP-SM, SP	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
230E: Entic Haplorthods, sandy-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-7	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand, fine sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-23	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	23-30	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	30-180	Sand, coarse sand	SM, SP-SM, SP	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
231B: Lamellic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Sand, fine sand, loamy sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-8	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	8-14	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	14-27	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	27-36	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	36-62	Sand, loamy sand	SC-SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-25	NP-10
	62-180	Loamy sand, sand, sandy loam	SM, SP-SM	A-3, A-2-4, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP

Table 18.--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	
231B: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-6, A-2-4, A-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
231C: Lamellic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Sand, fine sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-8	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	8-14	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	14-27	Sand, loamy sand, fine sand	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	27-36	Sand	SM, SP-SM, SP	A-3, A-1-b, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	36-62	Sand, loamy sand	SC-SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-25	NP-10
	62-180	Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC-SM, SC	A-4, A-2-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
231D: Lamellic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-8	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	8-14	Sand, loamy sand, fine sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	14-27	Sand, loamy sand, fine sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	27-36	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	36-62	Sand, loamy sand	SC-SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-25	NP-10
	62-180	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP

Table 18.--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	
231D: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC, CL, CL- ML, SC-SM	A-2-4, A-6, A-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
231E: Lamellic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-8	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	8-14	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	14-27	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	27-36	Sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	36-62	Sand, loamy sand	SP-SM, SC-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-25	NP-10
	62-180	Loamy sand, sand, sandy loam	SM, SP-SM	A-4, A-3, A- 2-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL-ML, SC, SC-SM, CL	A-4, A-6, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
232B: Entic Haplorthods, sandy, very deep water table-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-7	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-23	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	23-30	Sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	30-180	Sand, coarse sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP

Table 18.--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	
232B: Alfic Haplorthods, sandy, very deep water table-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC-SM, CL-ML, CL, SC	A-6, A-4, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
232D: Entic Haplorthods, sandy, very deep water table-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-3	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-15	0-14	NP
	3-7	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-23	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	23-30	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	30-180	Sand, coarse sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP

Table 18.--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	
232D: Alfic Haplorthods, sandy, very deep water table-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-4, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
233B: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
233B: Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	Slightly decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-11	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-24	Sand, loamy sand, fine sand	SP-SM, SM, SP	A-2-4, A-1-b, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-40	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	40-55	Sandy clay loam	SC-SM, SC	A-6, A-4	0	0	90-100	85-100	40-70	20-70	15-25	NP-20
	55-180	Sand, sandy loam, sandy clay loam	SC-SM, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-20

Table 18.--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	
233C: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP, SM, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL-ML, CL, SC, SC-SM	A-6, A-4, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
233C: Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	Slightly decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Sand, fine sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-11	Sand, loamy sand, fine sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-24	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-40	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	40-55	Sandy clay loam	SC-SM, SC	A-6, A-4	0	0	90-100	85-100	40-70	20-70	15-25	NP-20
	55-180	Sand, sandy loam, sandy clay loam	SC-SM, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-20

Table 18.--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	
233D: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-4, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
233D: Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	Slightly decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-11	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-24	Sand, loamy sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-40	Sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	40-55	Sandy clay loam	SC-SM, SC	A-4, A-6	0	0	90-100	85-100	40-70	20-70	15-25	NP-20
	55-180	Sand, sandy loam, sandy clay loam	SC-SM, SP-SM	A-3, A-4, A- 2-4	0	0	90-100	85-100	40-70	3-70	0-25	NP-20

Table 18.--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	
233E: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP, SM, SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC, CL, CL- ML, SC-SM	A-6, A-2-4, A-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
233E: Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	Slightly decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-2	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	2-3	Sand, fine sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	3-11	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	11-24	Sand, loamy sand, fine sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	90-100	85-100	40-70	3-15	0-14	NP
	24-40	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	85-100	40-70	3-15	0-14	NP
	40-55	Sandy clay loam	SC, SC-SM	A-6, A-4	0	0	90-100	85-100	40-70	20-70	15-25	NP-20
	55-180	Sand, sandy loam, sandy clay loam	SC-SM, SP-SM	A-4, A-2-4, A-3	0	0	90-100	85-100	40-70	3-70	0-25	NP-20

Table 18.--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	
234B: Lamellic Oxyaquic Haplorthods, sandy-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-5	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-70	0-15	0-14	NP
	5-7	Sand	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	85-100	35-70	0-25	0-14	NP
	7-10	Sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-25	0-14	NP
	10-16	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-25	0-14	NP
	16-27	Sand	SM, SP-SM, SP	A-3, A-1-b, A-2-4	0	0	95-100	85-100	35-70	0-15	0-14	NP
	27-55	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	85-100	35-70	0-15	0-14	NP
	55-84	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	35-75	0-25	0-14	NP

Table 18.--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	
235B: Alfic Haplorthods, sandy over loamy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Sand, loamy sand	SP, SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	6-9	Sand, loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	27-44	Sandy clay loam, silty clay loam, clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-2-4, A-6, A-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	44-52	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	35-75	0-30	0-25	NP-10
	52-120	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-25	NP-10

Table 18.--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	
235B: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	SC-SM, CL-ML, CL, SC	A-2-4, A-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
235C: Alfic Haplorthods, sandy over loamy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-6	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	6-9	Sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	9-27	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	27-44	Sandy clay loam, silty clay loam, clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-4, A- 2-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	44-52	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-25	NP-10
	52-120	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-25	NP-10

Table 18.--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	
235C: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-2-4, A-4	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
235D: Alfic Haplorthods, sandy over loamy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-6	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	6-9	Sand, loamy sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	9-27	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	27-44	Sandy clay loam, silty clay loam, clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-2-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	44-52	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-25	NP-10
	52-120	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-25	NP-10

Table 18.--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	
235D: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
235E: Alfic Haplorthods, sandy over loamy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-6	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	6-9	Sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	9-27	Sand, loamy sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	27-44	Sandy clay loam, silty clay loam, clay loam, silt loam	CL-ML, CL, SC, SC-SM	A-4, A-2-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	44-52	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-25	NP-10
	52-120	Sand, loamy sand, loamy fine sand, fine sand, sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-25	NP-10

Table 18.--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	
235E: Alfic Haplorthods, sandy-----	0-2	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	2-4	Loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-7	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	7-11	Sand, loamy sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	11-32	Sand, loamy sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-37	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-42	Sandy loam, fine sandy loam, sandy clay loam, silt loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4, A-6	0	0	90-100	75-100	45-95	20-80	20-40	4-18
	42-180	Sand, loamy sand, coarse sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
236B: Arenic Hapludalfs-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-4	Loamy sand, sand	SP-SM, SM	A-2-4, A-1-b	0	0	90-100	75-100	35-75	10-30	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	6-12	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	12-32	Loamy sand, sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	32-37	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam, gravelly sandy loam, gravelly fine sandy loam	SC-SM, SM, SC	A-2-4, A-4, A-6	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	37-47	Sandy clay loam, loam, clay loam, sandy loam, fine sandy loam, gravelly sandy clay loam, gravelly clay loam	SC-SM, SM, SC	A-2-4, A-6, A-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	47-72	Loamy sand, gravelly loamy sand, sand, loam	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	70-100	35-80	0-30	0-20	NP-10
	72-80	Stratified sand to gravelly sand to fine sand to loamy sand	SP, SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	70-100	35-80	0-30	0-14	NP

Table 18.--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	
236C: Arenic Hapludalfs-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-4	Loamy sand, sand	SP-SM, SM	A-1-b, A-2-4	0	0	90-100	75-100	35-75	10-30	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	35-75	5-30	0-14	NP
	6-12	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	12-32	Loamy sand, sand	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	35-75	5-30	0-14	NP
	32-37	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam, gravelly sandy loam, gravelly fine sandy loam	SC-SM, SC, SM	A-6, A-4, A-2-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	37-47	Sandy clay loam, loam, clay loam, sandy loam, fine sandy loam, gravelly sandy clay loam, gravelly clay loam	SC-SM, SC, SM	A-6, A-4, A-2-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	47-72	Loamy sand, gravelly loamy sand, sand, loam	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	70-100	35-80	0-30	0-20	NP-10
	72-80	Stratified sand to gravelly sand to fine sand to loamy sand	SP, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	70-100	35-80	0-30	0-14	NP

Table 18.--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	
236D: Arenic Hapludalfs-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-4	Loamy sand, sand	SM, SP-SM	A-1-b, A-2-4	0	0	90-100	75-100	35-75	10-30	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	5-30	0-14	NP
	6-12	Sand, loamy sand	SP-SM, SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-14	NP
	12-32	Loamy sand, sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	32-37	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam, gravelly sandy loam, gravelly fine sandy loam	SC, SC-SM, SM	A-6, A-4, A- 2-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	37-47	Sandy clay loam, loam, clay loam, sandy loam, fine sandy loam, gravelly sandy clay loam, gravelly clay loam	SC-SM, SC, SM	A-2-4, A-6, A-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	47-72	Loamy sand, gravelly loamy sand, sand, loam	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	70-100	35-80	0-30	0-20	NP-10
	72-80	Stratified sand to gravelly sand to fine sand to loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	70-100	35-80	0-30	0-14	NP

Table 18.--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	
236E: Arenic Hapludalfs-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-4	Loamy sand, sand	SM, SP-SM	A-2-4, A-1-b	0	0	90-100	75-100	35-75	10-30	0-14	NP
	4-6	Sand, loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	35-75	5-30	0-14	NP
	6-12	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	5-30	0-14	NP
	12-32	Loamy sand, sand	SM, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	35-75	5-30	0-14	NP
	32-37	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam, gravelly sandy loam, gravelly fine sandy loam	SC, SC-SM, SM	A-2-4, A-6, A-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	37-47	Sandy clay loam, loam, clay loam, sandy loam, fine sandy loam, gravelly sandy clay loam, gravelly clay loam	SM, SC-SM, SC	A-6, A-4, A- 2-4	0	0	90-100	70-100	40-85	20-50	15-30	NP-20
	47-72	Loamy sand, gravelly loamy sand, sand, loam	SP, SM, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	70-100	35-80	0-30	0-20	NP-10
	72-80	Stratified sand to gravelly sand to fine sand to loamy sand	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	70-100	35-80	0-30	0-14	NP

Table 18.--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	
237B: Glossudalfs, loamy-----	0-3	Sandy loam, loamy sand	SC, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SC-SM, SP-SM	A-4, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SC-SM, SP-SM, SC	A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SP-SM, SC, SC-SM	A-2-4, A-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-35

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
237C: Glossudalfs, loamy-----	In											
	0-3	Sandy loam, loamy sand	SC, SP-SM, SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SP-SM, SC-SM	A-1-b, A-2-4, A-4	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SC-SM, SC, SP-SM	A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SC, SC-SM, SP-SM	A-4, A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-35
237D: Glossudalfs, loamy-----	0-3	Sandy loam, loamy sand	SC, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SP-SM, SM, SP	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SP-SM, SC-SM	A-4, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SP-SM, SC, SC-SM	A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SC, SP-SM, SC-SM	A-2-4, A-4, A-3	0	0	90-100	75-100	40-70	3-55	0-45	NP-35

Table 18.--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	
237E: Glossudalfs, loamy-----	0-3	Sandy loam, loamy sand	SP-SM, SC, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SC-SM, SP-SM	A-2-4, A-4, A-1-b	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SP-SM, SC-SM, SC	A-3, A-2-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SC-SM, SC, SP-SM	A-3, A-2-4, A-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-35
247B: Glennie-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Loamy sand	SM, SP-SM	A-1, A-2-4	0	0-10	90-100	85-100	45-75	10-30	0-14	NP
	3-7	Loamy sand	SM, SP-SM	A-1, A-2-4	0	0-10	90-100	85-100	45-75	10-30	0-14	NP
	7-11	Sandy loam, loamy sand	SC-SM, SM, SP-SM	A-2-4, A-1, A-4	0	0-10	90-100	85-100	45-75	10-40	15-25	NP-10
	11-20	Loamy sand, sandy loam	CL, ML, SC, SM	A-4, A-2-4	0	0-10	90-100	85-100	45-85	10-75	10-35	NP-10
	20-40	Loamy sand, loam, sandy clay loam	SM, SC, CL, ML	A-4, A-2-6, A-2-4, A-6	0	0-10	90-100	85-100	45-85	10-75	10-35	NP-35
	40-46	Sandy clay loam, sandy loam, loamy sand	CH, SC, CL	A-6, A-7	0	0-10	90-100	85-100	65-95	45-90	30-65	10-35
	46-56	Clay, clay loam, sandy clay loam	CL, SC	A-7, A-6, A-4	0	0-10	90-100	85-100	65-90	45-75	25-50	7-25
	56-80	Sandy clay loam, clay loam, clay	SC, CL	A-4, A-6, A-7	0	0-10	90-100	85-100	65-90	45-75	25-50	7-25

Table 18.--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	
247B: Ossineke-----	0-9	Fine sandy loam	SC, SC-SM, SM	A-6, A-2-4, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	CL, SC-SM	A-4, A-6, A-2	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	SC-SM, CL	A-2, A-6, A-4	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	SC-SM, CL	A-4, A-6, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25

Table 18.--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	
247C: Glennie-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-3	Loamy sand	SM, SP-SM	A-2-4, A-1	0	0-10	90-100	85-100	45-75	10-30	0-14	NP
	3-7	Loamy sand	SM, SP-SM	A-1, A-2-4	0	0-10	90-100	85-100	45-75	10-30	0-14	NP
	7-11	Sandy loam, loamy sand	SP-SM, SC-SM, SM	A-2-4, A-4, A-1	0	0-10	90-100	85-100	45-75	10-40	15-25	NP-10
	11-20	Loamy sand, sandy loam	SM, SC, ML, CL	A-4, A-2-4	0	0-10	90-100	85-100	45-85	10-75	10-35	NP-10
	20-40	Loamy sand, loam, sandy clay loam	SM, SC, CL, ML	A-2-4, A-2-6, A-4, A-6	0	0-10	90-100	85-100	45-85	10-75	10-35	NP-35
	40-46	Sandy clay loam, sandy loam, loamy sand	CL, SC, CH	A-7, A-6	0	0-10	90-100	85-100	65-95	45-90	30-65	10-35
	46-56	Clay, clay loam, sandy clay loam	CL, SC	A-6, A-7, A-4	0	0-10	90-100	85-100	65-90	45-75	25-50	7-25
	56-80	Sandy clay loam, clay loam, clay	CL, SC	A-4, A-6, A-7	0	0-10	90-100	85-100	65-90	45-75	25-50	7-25

Table 18.--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		
247C: Ossineke-----	In											
	0-9	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-6	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	CL, SC-SM	A-2, A-4, A-6	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	SC-SM, CL	A-4, A-2, A-6	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	CL, SC-SM	A-2, A-4, A-6	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25

Table 18.--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	
250D: Glossudalfs-----	0-3	Sandy loam, loamy sand	SM, SC, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SM, SP-SM, SP	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SP-SM, SC-SM	A-4, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SP, SP-SM, SM	A-1-b, A-3, A-2-4	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SC-SM, SC, SP-SM	A-3, A-2-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SP-SM, SC-SM, SC	A-3, A-2-4, A-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-35
Haplosaprists, euic-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-25	Muck	PT	A-8	0	0	---	---	---	---	---	---
	25-30	Sand, sandy clay loam	SP-SM, SP, SM	A-2-4, A-3, A-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-80	Sand, sandy clay loam	SP, SM, SP-SM	A-4, A-3, A- 2-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
252A: Haplosaprists, euic-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-25	Muck	PT	A-8	0	0	---	---	---	---	---	---
	25-30	Sand, sandy clay loam	SP-SM, SM, SP	A-1-b, A-2-4, A-3, A-4	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-80	Sand, sandy clay loam	SP, SP-SM, SM	A-1-b, A-2-4, A-4, A-3	0	0	95-100	92-100	35-70	0-40	0-14	NP

Table 18.--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	
252A: Au Gres-----	0-4	Sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SM, SP-SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
254A: Haplosaprists, euc-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-25	Muck	PT	A-8	0	0	---	---	---	---	---	---
	25-30	Sand, sandy clay loam	SM, SP-SM, SP	A-1-b, A-3, A-4, A-2-4	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-80	Sand, sandy clay loam	SP, SP-SM, SM	A-4, A-1-b, A-2-4, A-3	0	0	95-100	92-100	35-70	0-40	0-14	NP
Fluvaquents-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-6	Muck	PT	A-8	0	0	---	---	---	---	---	---
	6-19	Loamy sand, sand	SM, SP-SM, SP	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
	19-34	Sand, gravelly loamy sand	SP-SM, SM, SP	A-2-4, A-3	0	0	90-100	70-100	50-80	0-35	0-14	NP
	34-80	Sand	SP-SM, SP, SM	A-2-4, A-3	0	0	90-100	70-100	50-80	0-35	0-14	NP

Table 18.--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	
254A: Aquic Udipsammments---	0-6	Sand	SP-SM, SM	A-1, A-3, A-2	0	0	95-100	85-100	40-70	5-15	0-14	NP
	6-22	Sand, coarse sand, fine sand, loamy sand, loamy fine sand	SP-SM, SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	5-15	0-14	NP
	22-45	Sand, coarse sand, fine sand, loamy sand, loamy fine sand	SM, SP-SM	A-2, A-1, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	45-80	Sand, coarse sand, fine sand, loamy sand, loamy fine sand	SM, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	5-15	0-14	NP
262A: Au Gres-----	0-4	Sand	SP-SM, SP, SM	A-3, A-1-b, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP-SM, SP, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SP-SM, SM, SP	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
264A: Allendale-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-5	Loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	5-10	Sand, loamy sand	SP-SM, SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-17	Sand, loamy sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-32	Sand, loamy sand	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-40	Clay, silty clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-63	Silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	63-80	Silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
265B: Glossudalfs-----	0-3	Sandy loam, loamy sand	SC, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	3-12	Loamy sand, sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-55	0-20	NP-35
	12-29	Sandy clay loam, sandy loam, loamy sand, loam, clay loam	SP-SM, SC-SM	A-4, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-70	0-14	NP-35
	29-43	Loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-45	NP-35
	43-58	Loamy sand, sandy loam, sandy clay loam, clay loam	SP-SM, SC, SC-SM	A-3, A-2-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-26
	58-84	Stratified loamy sand to loam, sandy loam, sandy clay loam, clay loam	SP-SM, SC, SC-SM	A-3, A-2-4, A-4	0	0	90-100	75-100	40-70	3-55	0-45	NP-35

Table 18.--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	
265B: Allendale-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-5	Sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	5-10	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-17	Sand, loamy sand	SM, SP-SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-32	Sand, loamy sand	SP, SP-SM, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-40	Clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-63	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	63-80	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
272: Endoaquods-----	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand, fine sand, loamy sand	SP-SM, SM, SP	A-3, A-1-b, A-2-4	0	0	90-100	75-100	35-75	0-30	0-14	NP
	8-13	Sand, loamy sand, fine sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	35-75	0-30	0-14	NP
	13-19	Sand, loamy sand, fine sandy loam	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP
	19-80	Sand, fine sand, loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	35-75	0-30	0-14	NP

Table 18.--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	
272: Fluvaquents, occasionally flooded-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-6	Muck	PT	A-8	0	0	---	---	---	---	---	---
	6-19	Loamy sand, sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	50-80	0-35	0-14	NP
	19-34	Gravelly loamy sand, sand	SP, SP-SM, SM	A-2-4, A-3	0	0	90-100	70-100	50-80	0-35	0-14	NP
	34-80	Sand	SM, SP, SP-SM	A-3, A-2-4	0	0	90-100	70-100	50-80	0-35	0-14	NP
273: Leafriver-----	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-20	Sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	45-70	3-35	0-14	NP
	20-40	Sand	SM, SP, SP-SM	A-2-4, A-3, A-2	0	0	95-100	90-100	45-70	3-35	0-14	NP
	40-80	Sand	SP-SM, SP, SM	A-2, A-2-4, A-3	0	0	95-100	90-100	45-70	3-35	0-14	NP
Wakeley-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-22	Sand	SP-SM, SP, SC-SM, SM	A-3, A-2-4	0	0	95-100	85-100	35-75	0-15	0-14	NP
	22-29	Clay, silty clay loam, sandy clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	29-80	Silty clay, silty clay loam, sandy clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40

Table 18.--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	
274: Typic Endoaquods, wet	0-1	Slightly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-5	Muck	PT	A-8	0	0	---	---	---	---	---	---
	5-11	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	75-100	35-75	0-15	0-14	NP
	11-15	Sand, loamy sand, fine sandy loam	SM, SP, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-70	0-15	0-25	NP-10
	15-19	Sand, loamy sand, fine sandy loam	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-25	NP-10
	19-37	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	37-80	Sand, fine sand, loamy sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
280: Aquents-----	0-80	Variable	---	---	---	---	---	---	---	---	---	---
Histosols-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-25	Muck	PT	A-8	0	0	---	---	---	---	---	---
	25-30	Sand, sandy clay loam	SP-SM, SM, SP	A-4, A-3, A- 2-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-80	Sand, sandy clay loam	SP, SM, SP-SM	A-3, A-4, A- 1-b, A-2-4	0	0	95-100	92-100	35-70	0-40	0-14	NP
281: Haplosaprists, dysic-----	0-2	Peat	PT	A-8	0	0	---	---	---	---	---	---
	2-8	Peat	PT	A-8	0	0	---	---	---	---	---	---
	8-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-36	Muck	PT	A-8	0	0	---	---	---	---	---	---
	36-80	Muck	PT	A-8	0	0	---	---	---	---	---	---

Table 18.--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	
282: Haplosaprists, euic-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Muck	PT	A-8	0	0	---	---	---	---	---	---
	13-25	Muck	PT	A-8	0	0	---	---	---	---	---	---
	25-30	Sand, sandy clay loam	SM, SP-SM, SP	A-4, A-3, A- 2-4, A-1-b	0	0	95-100	92-100	35-70	0-40	0-14	NP
	30-80	Sand, sandy clay loam	SP-SM, SP, SM	A-3, A-2-4, A-1-b, A-4	0	0	95-100	92-100	35-70	0-40	0-14	NP
307B: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-2, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP, SM, SP-SM	A-2-4, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SM, SC-SM, SP-SM, SP	A-1, A-2-4, A-3, A-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SP, SM	A-2-4, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
307E: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-2, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-2-4, A-1, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SC-SM, SP, SM, SP-SM	A-1, A-4, A- 3, A-2-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SP, SM	A-3, A-2, A- 2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP

Table 18.--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	
338B: Islandlake-----	In											
	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP-SM, SP	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	85-100	80-100	35-70	0-30	0-14	NP
338E: Islandlake-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP, SP-SM	A-3, A-1, A-2	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-1, A-3, A-2	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-70	0-30	0-14	NP
352B: Deford-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Muck	PT	A-8	0	0	---	---	---	---	---	---
	4-22	Sand	SP, SP-SM, SM	A-2-4, A-3	0	0	100	100	50-80	0-35	0-14	NP
	22-80	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
Au Gres-----	0-4	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP, SP-SM, SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
352B: Crowell-----	0-2	Sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	5-15	0-14	NP
	2-8	Sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-75	3-15	0-14	NP
	8-12	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	12-19	Sand	SP-SM, SP, SM	A-1-b, A-2-4, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	19-33	Sand	SP, SM, SP-SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
	33-80	Sand	SP-SM, SP, SM	A-2-4, A-1-b, A-3	0	0	90-100	75-100	40-70	3-15	0-14	NP
360: Wakeley-----	0-7	Muck	PT	A-8	0	0	---	---	---	---	---	---
	7-22	Sand	SP, SM, SP- SM, SC-SM	A-2-4, A-3	0	0	95-100	85-100	35-75	0-15	0-14	NP
	22-29	Clay, silty clay loam, sandy clay,	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	29-80	Silty clay, silty clay loam, sandy clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40

Table 18.--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	
362B: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SP-SM, SM, SC-SM	A-3, A-2-4, A-1-b	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SM, SC-SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SP-SM, SM, SC-SM	A-2-4, A-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	SC, ML, CL, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SP-SM, SC	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5
362D: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4, A-3	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SC-SM, SP-SM, SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	SM, SC, ML, CL	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-2-4, A-1-b	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
362E: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SP-SM, SC-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SC-SM, SM, SP-SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	SM, ML, CL, SC	A-2-4, A-1-b, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	SM, SC, ML, CL	A-2-4, A-1-b, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SP-SM, SC	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5
368A: Au Gres-----	0-4	Sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
	4-10	Sand	SP, SM, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-12	Sand	SP-SM, SM, SP	A-2-4, A-3, A-1-b	0	0	95-100	75-100	35-70	0-15	0-14	NP
	12-16	Sand	SP-SM, SM, SP	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	16-32	Sand	SP-SM, SP, SM	A-2-4, A-3, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-80	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP

Table 18.--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	
368A: Deford-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Muck	PT	A-8	0	0	---	---	---	---	---	---
	4-22	Sand	SP, SM, SP-SM	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
	22-80	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
369: Deford-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-4	Muck	PT	A-8	0	0	---	---	---	---	---	---
	4-22	Sand	SM, SP-SM, SP	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
	22-80	Sand	SP-SM, SP, SM	A-3, A-2-4	0	0	100	100	50-80	0-35	0-14	NP
371: Springport-----	0-4	Silt loam	CL-ML	A-4, A-6	0	0	97-100	97-100	80-100	70-90	25-40	7-15
	4-9	Silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	9-11	Silty clay, silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	11-16	Silty clay, silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	16-48	Silty clay loam, silty clay	CL, CH	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	48-80	Stratified silt loam to silty clay loam	CL, CH	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
380. Access denied												

Table 18.--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	
384B: Iosco-----	0-3	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	80-100	35-80	5-35	0-14	NP
	3-12	Sand	SP-SM, SM, SC-SM	A-3, A-1-b, A-2-4	0	0	90-100	80-100	35-85	5-35	0-14	NP
	12-15	Sand	SC-SM, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	80-100	35-85	5-35	0-14	NP
	15-18	Sand	SC-SM, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	80-100	35-85	5-35	0-14	NP
	18-20	Loamy sand, sand	SP-SM, SM, SC-SM	A-3, A-1-b, A-2-4	0	0	90-100	80-100	35-85	5-35	0-14	NP
	20-30	Sandy clay loam, loamy sand, loam, clay loam, silty clay loam, sand	SC-SM, SP-SM, SC	A-3, A-4, A- 2-4	0	0	90-100	80-100	35-85	5-45	0-25	NP-25
	30-42	Sandy clay loam, loam, clay loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A- 7, A-6	0	0	90-100	80-100	65-95	30-90	25-45	5-25
	42-80	Loam, sandy loam, clay loam, silty clay loam	CL, CL-ML	A-7, A-6, A-4	0	0	90-100	80-100	70-95	50-90	25-45	5-25

Table 18.--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	
388B: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SP-SM, SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SC-SM, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SC-SM, SP-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SM, SP-SM, SC-SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	ML, SC, SM, CL	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	CL, ML, SC, SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-2-4, A-1-b	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5
Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-2, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP-SM, SM, SP	A-3, A-2-4, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SC-SM, SM, SP, SP-SM	A-4, A-3, A-1, A-2-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SM, SP, SP-SM	A-3, A-2, A-2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP

Table 18.--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	
388B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SM, SP	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-1, A- 2-4	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
388D: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SC-SM, SP-SM, SM	A-3, A-1-b, A-2-4	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SP-SM, SC-SM, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	ML, SM, SC, CL	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	CL, ML, SC, SM	A-4, A-1-b, A-2-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SM, SP-SM	A-2-4, A-1-b	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
388D: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-1, A-3, A-2	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SP-SM, SP, SM, SC-SM	A-3, A-2-4, A-4, A-1	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SP, SM	A-2-4, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SM, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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	
388E: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4, A-3	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SP-SM, SC-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SM, SC-SM, SP-SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	SM, SC, ML, CL	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	SM, CL, SC, ML	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5
Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-1, A-3, A-2	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SP-SM, SP, SC-SM, SM	A-4, A-3, A- 2-4, A-1	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SM, SP	A-2-4, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP

Table 18.--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	
388E: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SP-SM, SM	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
390B: Horsehead-----	0-3	Sand	SP, SP-SM, SM	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP-SM, SP, GP, GP-GM	A-2-4, A-3, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GP, SM, SP, GM	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-1, A-2-4, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP, SP-SM, GP-GM, SP	A-1, A-3, A- 2-4	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
390B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
390D: Horsehead-----	0-3	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP, SP-SM, GP-GM, GP	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	SP-SM, SP, GP-GM, GP	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SM, GM, GP, SP	A-3, A-2-4, A-1	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP-GM, SP, GP, SP-SM	A-2-4, A-3, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
390D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM, SP	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP-SM, SP	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
390E: Horsehead-----	0-3	Sand	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	GP, SP-SM, SP, GP-GM	A-2-4, A-1, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GP, GM, SM, SP	A-1, A-3, A- 2-4	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-1, A- 2-4	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
390E: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP-SM, SP	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SM, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP, SP-SM, SM	A-1, A-3, A- 2-4	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
390F: Horsehead-----	0-3	Sand	SP-SM, SM, SP	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-3, A-2-4, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP, GP-GM, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GM, GP, SM, SP	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	GP, SP, SP- SM, GP-GM	A-2-4, A-3, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP, GP-GM, SP, SP-SM	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
390F: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP, SP-SM, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
391B: Horsehead-----	0-3	Sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP, SP-SM, GP, GP-GM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	SP, GP, GP- GM, SP-SM	A-2-4, A-1, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SP, SM, GP, GM	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-2-4, A-3, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP-SM, SP, GP-GM, GP	A-2-4, A-1, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
393B: Morganlake-----	0-2	Loamy sand	SM, SP-SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC-SM, SC, CL	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	CL, SC, SC-SM	A-7, A-6, A-2	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30

Table 18.--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	
393C: Morganlake-----	0-2	Loamy sand	SP-SM, SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC, SC-SM, CL	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	CL, SC, SC-SM	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30

Table 18.--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	
399D: Menominee-----	0-4	Sand	SP-SM, SM	A-3	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	4-7	Sand, loamy sand, fine sand, loamy fine sand	SP, SM, SP-SM	A-1-b, A-3, A-2-4	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	7-18	Sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	18-23	Sand, fine sand	SP, SM, SP-SM	A-1-b, A-3, A-2-4	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	23-39	Clay loam, sandy loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0-7	95-100	85-100	50-95	25-80	25-40	5-25
	39-59	Clay loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0-7	95-100	85-100	50-95	25-80	25-40	5-25
	59-80	Loam, clay loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A- 1, A-2	0	0-7	95-100	85-100	45-95	20-80	25-40	5-25

Table 18.--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	
399D: Bamfield, sandy substratum-----	0-7	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-2-6, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	7-12	Loamy fine sand, sandy loam, fine sandy loam, loamy sand	SC, SM, SC-SM	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	50-85	25-50	0-30	NP-11
	12-18	Loamy sand, clay loam, loamy sand, sandy loam, fine sandy loam, sandy clay loam	SC-SM, SC, CL	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	45-85	20-75	20-35	5-20
	18-26	Clay loam, sandy clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-50	9-25
	26-39	Loam, clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	39-53	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	53-79	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	79-80	Sand, loamy sand, gravelly sand, gravelly loamy sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0-5	75-100	60-100	30-100	0-15	0-0	NP

Table 18.--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	
399D: Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Sand, loamy sand, sandy loam	SM, SP-SM	A-4, A-2-4, A-3	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
400F: Menominee-----	0-4	Sand	SM, SP-SM	A-3	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	4-7	Sand, loamy sand, fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	7-18	Sand, fine sand	SM, SP, SP-SM	A-3, A-2-4, A-1-b	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	18-23	Sand, fine sand	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0-7	95-100	85-100	30-75	0-15	0-14	NP
	23-39	Clay loam, sandy loam, silty clay loam	CL-ML, CL	A-4, A-6	0	0-7	95-100	85-100	50-95	25-80	25-40	5-25
	39-59	Clay loam, silty clay loam	CL-ML, CL	A-4, A-6	0	0-7	95-100	85-100	50-95	25-80	25-40	5-25
	59-80	Loam, clay loam, silty clay loam	SC, CL-ML, CL, SC-SM	A-1, A-2, A- 6, A-4	0	0-7	95-100	85-100	45-95	20-80	25-40	5-25

Table 18.--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	
400F: Bamfield, sandy substratum-----	0-7	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-2-6, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	7-12	Loamy fine sand, sandy loam, fine sandy loam, loamy sand	SM, SC-SM, SC	A-2-6, A-4, A-2-4	0	0-5	95-100	85-100	50-85	25-50	0-30	NP-11
	12-18	Loamy sand, clay loam, loamy sand, sandy loam, fine sandy loam, sandy clay loam	CL, SC-SM, SC	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	45-85	20-75	20-35	5-20
	18-26	Clay loam, sandy clay loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-50	9-25
	26-39	Loam, clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	39-53	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	53-79	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	79-80	Sand, loamy sand, gravelly sand, gravelly loamy sand	SP-SM, SM	A-2-4, A-3, A-1-b	0	0-5	75-100	60-100	30-100	0-15	0-0	NP

Table 18.--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	
400F: Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SP-SM, SM	A-3, A-1-b, A-2-4	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
424B: Morganlake-----	0-2	Loamy sand	SP-SM, SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC-SM, SC, CL	A-7, A-2, A-6	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	SC-SM, SC, CL	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30

Table 18.--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	
424B: Ossineke, sandy substratum-----	0-8	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4, A-6	0	0-6	90-100	85-95	55-85	30-50	0-30	NP-11
	8-13	Sandy loam, fine sandy loam	SC-SM, SM, SC	A-6, A-4, A- 2-4	0	0-6	90-100	85-95	55-85	30-50	0-30	NP-11
	13-21	Sandy clay loam, sandy loam, clay loam	SC, CL	A-6, A-4, A-7	0	0-6	90-100	85-95	65-95	35-80	20-45	9-25
	21-38	Sandy clay loam, clay loam	CL, SC	A-4, A-7, A-6	0	0-6	90-100	85-95	65-95	35-80	20-45	9-25
	38-51	Sandy loam, loam, clay loam	CL	A-7, A-6	0	0-6	90-100	85-95	70-95	50-80	25-45	5-25
	51-77	Sandy loam, loam, clay loam	CL	A-7, A-6	0	0-6	90-100	85-95	70-95	50-80	25-45	5-25
	77-80	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0-6	65-100	60-95	30-95	0-15	0-14	NP
	Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---
5-8		Sand	SP-SM, SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
8-13		Sand	SP-SM, SM	A-3, A-1-b, A-2-4	0	0	95-100	95-100	40-75	5-30	0-14	NP
13-28		Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
28-51		Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
51-80		Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP

Table 18.--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	
424C: Morganlake-----	0-2	Loamy sand	SM, SP-SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-7, A-6	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-7, A-6	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC, CL, SC-SM	A-2, A-7, A-6	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	SC-SM, SC, CL	A-2, A-7, A-6	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30

Table 18.--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	
424C: Ossineke, sandy substratum-----	0-8	Fine sandy loam	SC-SM, SC, SM	A-6, A-2-4, A-4	0	0-6	90-100	85-95	55-85	30-50	0-30	NP-11
	8-13	Sandy loam, fine sandy loam	SC, SC-SM, SM	A-6, A-4, A- 2-4	0	0-6	90-100	85-95	55-85	30-50	0-30	NP-11
	13-21	Sandy clay loam, sandy loam, clay loam	CL, SC	A-6, A-4, A-7	0	0-6	90-100	85-95	65-95	35-80	20-45	9-25
	21-38	Sandy clay loam, clay loam	CL, SC	A-7, A-4, A-6	0	0-6	90-100	85-95	65-95	35-80	20-45	9-25
	38-51	Sandy loam, loam, clay loam	CL	A-7, A-6	0	0-6	90-100	85-95	70-95	50-80	25-45	5-25
	51-77	Sandy loam, loam, clay loam	CL	A-7, A-6	0	0-6	90-100	85-95	70-95	50-80	25-45	5-25
	77-80	Sand, loamy sand, gravelly loamy sand, gravelly sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0-6	65-100	60-95	30-95	0-15	0-14	NP
Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-4, A-3	0	0	95-100	95-100	40-75	5-40	0-14	NP

Table 18.--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	
426B: Coppler-----	0-3	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	6-14	Gravelly sand, sand	SM, SP-SM	A-2, A-3, A- 1-b	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	14-20	Gravelly sand, sand	SP-SM, SM	A-2, A-1-b, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	20-26	Very gravelly sandy clay loam, very gravelly sandy loam	SC-SM, SP-SC, SC	A-1, A-2, A- 4, A-6	0	0-5	85-100	30-55	20-55	5-50	20-35	NP-20
	26-31	Very gravelly sand, extremely gravelly sand	SW, SP, GW, GP	A-3, A-2, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	31-50	Extremely gravelly sand	SW, SP, GW, GP	A-1, A-2, A-3	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	50-80	Stratified sand to very gravelly sand, extremely gravelly sand	SW, GW, GP, SP	A-1, A-2, A-3	0	1-10	40-90	30-55	20-55	0-15	0-14	NP

Table 18.--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	
441B: Morganlake-----	0-2	Loamy sand	SM, SP-SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SM, SP-SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-7, A-6	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC, SC-SM, CL	A-6, A-7, A-2	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	SC-SM, CL, SC	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
Nester-----	0-3	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-100	85-100	65-100	50-90	15-35	5-15
	3-6	Loam, sandy loam, clay loam	CL, ML, SC, SM	A-2-6, A-2-4, A-4, A-6	0	0-5	90-100	85-100	45-100	20-90	15-35	NP-15
	6-16	Clay loam, silty clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	16-34	Clay, clay loam, silty clay loam	CL, CH	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	34-41	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
	41-80	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25

Table 18.--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	
441C: Morganlake-----	0-2	Loamy sand	SP-SM, SM	A-3	0	0-7	95-100	92-100	50-75	0-15	0-14	NP
	2-5	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	5-11	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	11-21	Sand, loamy sand	SP-SM, SM	A-2-4	0	0-7	95-100	92-100	50-75	5-30	0-14	NP
	21-23	Sandy clay loam, sand, clay loam, silty clay loam, loamy sand	CL	A-7, A-6	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	23-28	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0-7	80-100	80-95	65-95	55-75	25-45	10-30
	28-33	Sandy loam, clay loam, silty clay loam	SC-SM, SC, CL	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
	33-80	Loam, sandy clay loam, clay loam, silty clay loam	CL, SC, SC-SM	A-2, A-6, A-7	0	0-7	80-100	80-95	65-95	30-95	25-45	5-30
Nester-----	0-3	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	65-100	50-90	15-35	5-15
	3-6	Loam, sandy loam, clay loam	SM, CL, ML, SC	A-2-4, A-2-6, A-4, A-6	0	0-5	90-100	85-100	45-100	20-90	15-35	NP-15
	6-16	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	16-34	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0-5	90-100	85-100	75-100	55-95	40-55	10-30
	34-41	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25
	41-80	Clay loam, silty clay loam	CL	A-7	0	0-5	90-100	85-100	70-100	50-95	40-50	15-25

Table 18.--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	
452D: Bamfield, sandy substratum-----	0-7	Fine sandy loam	SC, SC-SM, SM	A-2-6, A-2-4, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	7-12	Loamy fine sand, sandy loam, fine sandy loam, loamy sand	SC, SC-SM, SM	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	50-85	25-50	0-30	NP-11
	12-18	Loamy sand, clay loam, loamy sand, sandy loam, fine sandy loam, sandy clay loam	CL, SC, SC-SM	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	45-85	20-75	20-35	5-20
	18-26	Clay loam, sandy clay loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-50	9-25
	26-39	Loam, clay loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	39-53	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	53-79	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	79-80	Sand, loamy sand, gravelly sand, gravelly loamy sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0-5	75-100	60-100	30-100	0-15	0-0	NP

Table 18.--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	
475B: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SP, SP-SM, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SM, SP	A-3, A-1, A-2	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SM	A-2, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP-SM, SP	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SC-SM, SM, SP-SM, SP	A-1, A-3, A- 2-4, A-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP, SP-SM, SM	A-2-4, A-3, A-2	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
475D: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP, SM, SP-SM	A-2, A-3, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10

Table 18.--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	
475D: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM	A-1, A-3, A-2	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP, SP-SM, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SM, SP-SM, SP	A-1, A-3, A- 2-4	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SP-SM, SP, SM, SC-SM	A-3, A-1, A- 2-4, A-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SM, SP-SM, SP	A-3, A-2, A- 2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
475E: Graycalm-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SP-SM, SP, SM	A-2, A-3, A-1	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	3-7	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	7-17	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	17-24	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0-5	95-100	80-100	30-75	0-30	0-14	NP
	24-80	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-3, A-2-4, A-1	0	0-5	95-100	80-100	30-75	0-30	0-20	NP-10
Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM	A-2, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SC-SM, SM, SP, SP-SM	A-4, A-1, A- 2-4, A-3	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP-SM, SP, SM	A-3, A-2, A- 2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP

Table 18.--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	
476B: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SP, SM, SC- SM, SP-SM	A-1, A-4, A- 3, A-2-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SM, SP, SP-SM	A-2-4, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
Perecheney-----	0-2	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	7-12	Sand, loamy sand, loamy fine sand	SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	12-21	Sand, loamy sand, loamy fine sand	SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	21-28	Loamy sand, loamy sand, loamy fine sand	SP-SM	A-4, A-2-4	0	0	95-100	85-100	55-95	5-40	0-14	NP
	28-42	Loam, sandy clay loam, sandy loam, sand	SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	40-80	10-40	NP-20
	42-44	Loamy sand, sandy loam, very fine sandy loam, sand	CL, CL-ML, SC	A-4, A-6	0	0	95-100	85-100	55-95	40-80	10-30	NP-20
	44-80	Sand, loamy sand	SP-SM, SC-SM, SM	A-1-b, A-3, A-2-4	0	0	95-100	85-100	40-75	5-30	0-14	NP

Table 18.--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	
476D: Klacking-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP-SM	A-1, A-3, A-2	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	2-3	Sand	SP-SM, SP, SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	3-21	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	90-100	75-100	35-75	0-30	0-14	NP
	21-30	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-2-4, A-3, A-1	0	0-5	90-100	75-100	35-75	0-30	0-14	NP-10
	30-41	Sandy loam, loamy sand	SC-SM, SP, SP-SM, SM	A-1, A-2-4, A-3, A-4	0	0-5	90-100	75-100	35-70	0-40	0-25	NP-10
	41-80	Sand	SP, SM, SP-SM	A-3, A-2, A- 2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
Perecheney-----	0-2	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM	A-2-4, A-1-b, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	7-12	Sand, loamy sand, loamy fine sand	SM	A-2-4, A-3, A-1-b	0	0	95-100	85-100	40-70	5-15	0-14	NP
	12-21	Sand, loamy sand, loamy fine sand	SM	A-1-b, A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP
	21-28	Loamy sand, loamy sand, loamy fine sand	SP-SM	A-4, A-2-4	0	0	95-100	85-100	55-95	5-40	0-14	NP
	28-42	Loam, sandy clay loam, sandy loam, sand	SC, CL-ML, CL	A-6, A-4	0	0	95-100	85-100	55-95	40-80	10-40	NP-20
	42-44	Loamy sand, sandy loam, very fine sandy loam, sand	CL, CL-ML, SC	A-4, A-6	0	0	95-100	85-100	55-95	40-80	10-30	NP-20
	44-80	Sand, loamy sand	SP-SM, SM, SC-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-75	5-30	0-14	NP

Table 18.--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	
488A: Allendale-----	0-1	Moderately decomposed plant material	---	---	0	0	---	---	---	---	---	---
	1-5	Sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-70	0-15	0-14	NP
	5-10	Sand, loamy sand	SM, SP, SP-SM	A-1-b, A-3, A-2-4	0	0	95-100	75-100	35-75	0-15	0-14	NP
	10-17	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1-b, A-2-4	0	0	90-100	75-100	40-70	3-15	0-14	NP
	17-32	Sand, loamy sand	SP, SM, SP-SM	A-3, A-2-4, A-1-b	0	0	90-100	75-100	40-70	3-15	0-14	NP
	32-40	Clay, silty clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	40-63	Silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
	63-80	Silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	75-95	40-65	20-40
496B: Gerrish-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-4	Sand	SM, SP, SP-SM	A-3, A-1	0	0	95-100	85-100	35-55	0-15	0-14	NP
	4-10	Sand, gravelly sand	SP, SP-SM, GP-GM, GP	A-3, A-1	0	0-20	55-95	50-75	15-70	0-10	0-14	NP
	10-21	Gravelly sand, sand	SP-SM, GP, GP-GM, SP	A-2, A-1	0	0-20	55-95	50-75	15-70	0-10	0-14	NP
	21-60	Sand, loamy sand, sandy loam	SM, SP, SP-SM	A-1, A-2, A- 2-4	0	0-5	95-100	80-100	35-55	0-15	0-14	NP-10
	60-80	Sand	SM, SP, SP-SM	A-2-4, A-2, A-3	0	0-5	95-100	80-100	35-55	0-15	0-14	NP
Grayling-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	2-7	Sand	SP-SM, SP, SM	A-3, A-2, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	7-15	Sand	SM, SP-SM, SP	A-2, A-3, A-1	0	0	95-100	85-100	45-70	3-15	0-14	NP
	15-23	Sand	SP, SM, SP-SM	A-3, A-2, A-1	0	0	95-100	85-100	40-70	0-15	0-14	NP
	23-80	Sand	SP, SM, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	40-70	0-15	0-14	NP

Table 18.--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	
503D: Bamfield, sandy substratum-----	0-7	Fine sandy loam	SM, SC-SM, SC	A-2-6, A-2-4, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	7-12	Loamy fine sand, sandy loam, fine sandy loam, loamy sand	SM, SC-SM, SC	A-2-4, A-4, A-2-6	0	0-5	95-100	85-100	50-85	25-50	0-30	NP-11
	12-18	Loamy sand, clay loam, loamy sand, sandy loam, fine sandy loam, sandy clay loam	CL, SC, SC-SM	A-2-6, A-4, A-2-4	0	0-5	95-100	85-100	45-85	20-75	20-35	5-20
	18-26	Clay loam, sandy clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-50	9-25
	26-39	Loam, clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	39-53	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	53-79	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	79-80	Sand, loamy sand, gravelly sand, gravelly loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0-5	75-100	60-100	30-100	0-15	0-0	NP

Table 18.--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	
503D: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sandy, loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SM, SP-SM, SC-SM	A-1-b, A-2-4, A-3	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SC-SM, SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	ML, SC, SM, CL	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	CL, ML, SM, SC	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SM, SP-SM	A-2-4, A-1-b	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
503D: Horsehead-----	0-3	Sand	SP-SM, SP, SM	A-2-4, A-1, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP-GM, GP, SP, SP-SM	A-3, A-2-4, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SP, SM, GM, GP	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	GP, GP-GM, SP, SP-SM	A-2-4, A-1, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP, GP-GM, SP, SP-SM	A-1, A-2-4, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
503E: Bamfield, sandy substratum-----	0-7	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-2-6, A-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	7-12	Loamy fine sand, sandy loam, fine sandy loam, loamy sand	SM, SC-SM, SC	A-4, A-2-6, A-2-4	0	0-5	95-100	85-100	50-85	25-50	0-30	NP-11
	12-18	Loamy sand, clay loam, loamy sand, sandy loam, fine sandy loam, sandy clay loam	SC, CL, SC-SM	A-4, A-2-4, A-2-6	0	0-5	95-100	85-100	45-85	20-75	20-35	5-20
	18-26	Clay loam, sandy clay loam	CL	A-6, A-4	0	0-5	95-100	85-100	70-90	50-80	20-50	9-25
	26-39	Loam, clay loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	39-53	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	53-79	Loam, sandy clay loam, clay loam, sandy loam, fine sandy loam	CL	A-4, A-6	0	0-5	95-100	85-100	70-90	50-80	20-45	9-25
	79-80	Sand, loamy sand, gravelly sand, gravelly loamy sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0-5	75-100	60-100	30-100	0-15	0-0	NP

Table 18.--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	
503E: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SP-SM, SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SP-SM, SM, SC-SM	A-4, A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	ML, SC, SM, CL	A-1-b, A-4, A-2-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SP-SM, SC	A-2-4, A-1-b	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SP-SM, SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
503E: Horsehead-----	0-3	Sand	SM, SP, SP-SM	A-2-4, A-3, A-1	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	GP-GM, SP, GP, SP-SM	A-2-4, A-1, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP, SP-SM, SP, GP-GM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GM, GP, SM, SP	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP-SM, SP, GP-GM, GP	A-2-4, A-1, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
504B: Coppler-----	0-3	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-6	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	6-14	Gravelly sand, sand	SP-SM, SM	A-2, A-1-b, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	14-20	Gravelly sand, sand	SM, SP-SM	A-1-b, A-2, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	20-26	Very gravelly sandy clay loam, very gravelly sandy loam	SP-SC, SC-SM, SC	A-2, A-6, A- 1, A-4	0	0-5	85-100	30-55	20-55	5-50	20-35	NP-20
	26-31	Very gravelly sand, extremely gravelly sand	GP, GW, SP, SW	A-3, A-2, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	31-50	Extremely gravelly sand	GP, GW, SP, SW	A-1, A-2, A-3	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	50-80	Stratified sand to very gravelly sand, extremely gravelly sand	GW, SP, SW, GP	A-2, A-3, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP

Table 18.--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	
504B: Horsehead-----	0-3	Sand	SP-SM, SP, SM	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP-SM, GP-GM, GP, SP	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP, GP-GM, SP, SP-SM	A-2-4, A-3, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SP, SM, GP, GM	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP-GM, GP	A-1, A-2-4, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP, GP-GM, GP, SP-SM	A-3, A-1, A- 2-4	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
504D: Coppler-----	0-3	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-6	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	6-14	Gravelly sand, sand	SM, SP-SM	A-2, A-1-b, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	14-20	Gravelly sand, sand	SM, SP-SM	A-1-b, A-2, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	20-26	Very gravelly sandy clay loam, very gravelly sandy loam	SP-SC, SC-SM, SC	A-1, A-4, A- 2, A-6	0	0-5	85-100	30-55	20-55	5-50	20-35	NP-20
	26-31	Very gravelly sand, extremely gravelly sand	GP, GW, SP, SW	A-3, A-2, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	31-50	Extremely gravelly sand	SW, SP, GW, GP	A-2, A-1, A-3	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	50-80	Stratified sand to very gravelly sand, extremely gravelly sand	SW, SP, GW, GP	A-3, A-2, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP

Table 18.--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	
504D: Horsehead-----	0-3	Sand	SM, SP-SM, SP	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP-SM, SP, GP-GM, GP	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP-GM, GP, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SM, SP, GM, GP	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	GP, GP-GM, SP, SP-SM	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP-GM, SP, SP-SM, GP	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
504E: Coppler-----	0-3	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-6	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	6-14	Gravelly sand, sand	SP-SM, SM	A-2, A-1-b, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	14-20	Gravelly sand, sand	SP-SM, SM	A-1-b, A-2, A-3	0	0-5	95-100	85-95	30-75	5-30	0-14	NP
	20-26	Very gravelly sandy clay loam, very gravelly sandy loam	SP-SC, SC-SM, SC	A-4, A-6, A- 2, A-1	0	0-5	85-100	30-55	20-55	5-50	20-35	NP-20
	26-31	Very gravelly sand, extremely gravelly sand	GP, GW, SP, SW	A-3, A-2, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	31-50	Extremely gravelly sand	SP, SW, GW, GP	A-2, A-3, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP
	50-80	Stratified sand to very gravelly sand, extremely gravelly sand	SW, SP, GW, GP	A-2, A-3, A-1	0	1-10	40-90	30-55	20-55	0-15	0-14	NP

Table 18.--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	
504E: Horsehead-----	0-3	Sand	SP, SM, SP-SM	A-3, A-1, A-2-4	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	GP, SP-SM, SP, GP-GM	A-2-4, A-3, A-1	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP, SP, GP-GM, SP-SM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GM, GP, SM, SP	A-3, A-2-4, A-1	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, SP, GP, GP-GM	A-2-4, A-3, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP-SM, SP, GP-GM, GP	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
505B: Ossineke-----	0-9	Fine sandy loam	SC, SC-SM, SM	A-2-4, A-4, A-6	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	CL, SC-SM	A-4, A-2, A-6	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	CL, SC-SM	A-6, A-4, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	CL, SC-SM	A-2, A-6, A-4	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25

Table 18.--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	
505B: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SP-SM, SM	A-1-b, A-2-4	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SC-SM, SP-SM, SM	A-2-4, A-3, A-1-b	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SP-SM, SM, SC-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SM, SC-SM, SP-SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	SC, ML, CL, SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	SC, SM, CL, ML	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SM, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
505B: Horsehead-----	0-3	Sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	GP-GM, SP, GP, SP-SM	A-3, A-1, A- 2-4	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	SP-SM, SP, GP, GP-GM	A-3, A-1, A- 2-4	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	GM, GP, SM, SP	A-1, A-2-4, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	SP-SM, GP, GP-GM, SP	A-2-4, A-1, A-3	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	GP, GP-GM, SP, SP-SM	A-3, A-1, A- 2-4	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
505C: Ossineke-----	0-9	Fine sandy loam	SM, SC-SM, SC	A-6, A-4, A-2-4	0	0-5	95-100	85-100	55-85	30-50	0-30	NP-11
	9-16	Clay loam, loamy fine sand, loam, sandy clay loam, sandy loam, fine sandy loam	SC-SM, CL	A-2, A-4, A-6	0	0-5	95-100	85-100	55-95	30-80	25-40	7-25
	16-20	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	20-29	Clay loam, loam, sandy clay loam	CL	A-6	0	0-5	95-100	85-100	70-95	50-80	25-45	10-25
	29-50	Loam, sandy loam, fine sandy loam, sandy clay loam, clay loam	SC-SM, CL	A-4, A-6, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25
	50-80	Sandy loam, fine sandy loam, loam, sandy clay loam, clay loam	SC-SM, CL	A-6, A-4, A-2	0	0-5	95-100	85-100	45-95	30-80	25-40	7-25

Table 18.--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	
505C: Millersburg-----	0-1	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	1-2	Loamy sand	SM, SP-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	2-4	Sand, loamy sand	SP-SM, SM	A-2-4, A-1-b	0	0-8	95-100	80-100	40-75	5-20	0-14	NP
	4-8	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-3, A-2-4	0	0-8	95-100	80-100	35-70	5-20	0-14	NP
	8-12	Loamy sand, sand	SM, SP-SM, SC-SM	A-2-4, A-1-b	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	12-14	Loamy sand, sand	SP-SM, SM, SC-SM	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	35-65	5-40	0-14	NP
	14-27	Sandy loam, sand, sandy clay loam, loamy sand	CL, ML, SC, SM	A-2-4, A-4, A-1-b	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	27-34	Sandy loam, sandy clay loam	SM, SC, ML, CL	A-1-b, A-2-4, A-4	0	0-8	95-100	80-100	45-90	20-60	0-30	NP-15
	34-76	Sandy loam, loamy sand	SC, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-10
	76-80	Loamy sand, sandy loam	SM, SP-SM	A-1-b, A-2-4	0	0-8	85-100	80-100	40-65	10-35	0-25	NP-5

Table 18.--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	
505C: Horsehead-----	0-3	Sand	SM, SP-SM, SP	A-2-4, A-1, A-3	0	0-15	95-100	85-100	40-70	0-15	0-14	NP
	3-11	Gravelly sand, sand, loamy sand, very gravelly sand	SP-SM, SP, GP, GP-GM	A-1, A-2-4, A-3	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	11-23	Sand, gravelly sand, very gravelly sand, loamy sand	GP, GP-GM, SP, SP-SM	A-3, A-1, A- 2-4	0	0-15	35-100	25-100	10-70	0-15	0-14	NP
	23-36	Very gravelly loamy sand, gravelly loamy sand, extremely gravelly loamy sand	SM, GM, GP, SP	A-2-4, A-1, A-3	0-5	0-25	20-95	20-90	10-70	0-20	2-18	NP-5
	36-47	Very gravelly sand	GP, GP-GM, SP, SP-SM	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP
	47-80	Stratified sand to very gravelly coarse sand to very gravelly sand	SP, GP, GP- GM, SP-SM	A-3, A-2-4, A-1	0-5	0-25	30-100	20-95	10-70	0-15	0-14	NP

Table 18.--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	
506B: Durkeelake-----	0-3	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-9	Sand	SM, SP-SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	40-70	5-15	0-14	NP
	9-13	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	85-100	40-70	5-15	0-14	NP
	13-25	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	25-31	Silty clay loam, loamy fine sand, sandy clay loam, clay loam, very fine sandy loam	SC, CL-ML, CL	A-4, A-2-4, A-6	0	0	95-100	85-100	55-95	15-80	25-40	7-20
	31-33	Silt loam	SC, CL-ML, CL	A-6, A-4	0	0	95-100	85-100	55-95	40-80	25-40	7-20
	33-80	Stratified silt loam to silty clay loam to very fine sandy loam	CL, CL-ML, SC	A-6, A-4	0	0	95-100	85-100	55-95	40-80	25-40	7-20
506C: Durkeelake-----	0-3	Highly decomposed plant material	---	---	---	---	---	---	---	---	---	---
	3-9	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	9-13	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	13-25	Sand	SP-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	25-31	Silty clay loam, loamy fine sand, sandy clay loam, clay loam, very fine sandy loam	CL, CL-ML, SC	A-4, A-2-4, A-6	0	0	95-100	85-100	55-95	15-80	25-40	7-20
	31-33	Silt loam	CL, CL-ML, SC	A-6, A-4	0	0	95-100	85-100	55-95	40-80	25-40	7-20
	33-80	Stratified silt loam to silty clay loam to very fine sandy loam	CL, CL-ML, SC	A-6, A-4	0	0	95-100	85-100	55-95	40-80	25-40	7-20

Table 18.--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	
507D: Islandlake-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SP-SM, SP, SM	A-2, A-1, A-3	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP, SP-SM	A-2, A-3, A-1	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-30	0-14	NP
508B: Islandlake-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SP-SM, SP, SM	A-3, A-1, A-2	0	0-5	85-100	80-100	35-70	0-30	0-14	NP
Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Loamy sand, sand, sandy loam	SM, SP-SM	A-2-4, A-4, A-3	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP

Table 18.--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	
508D: Islandlake-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SP, SM, SP-SM	A-3, A-1, A-2	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SM, SP, SP-SM	A-2, A-3, A-1	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SM, SP, SP-SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-70	0-30	0-14	NP
Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SP-SM, SM	A-3, A-2-4, A-1-b	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SP-SM, SM	A-3, A-1-b, A-2-4	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SM, SP-SM	A-1-b, A-3, A-2-4	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Loamy sand, sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
508E: Islandlake-----	0-2	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	2-7	Sand	SM, SP, SP-SM	A-1, A-3, A-2	0	0-5	85-100	80-100	35-75	0-15	0-14	NP
	7-10	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-75	0-30	0-14	NP
	10-18	Sand	SP, SP-SM	A-1, A-2, A-3	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	18-27	Sand	SP, SP-SM	A-3, A-2, A-1	0	0-5	85-100	80-100	35-70	0-15	0-14	NP
	27-80	Sand, loamy sand	SM, SP, SP-SM	A-3, A-1, A-2	0	0-5	85-100	80-100	35-70	0-30	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
508E: Blue Lake-----	0-5	Moderately decomposed plant material	---	---	---	---	---	---	---	---	---	---
	5-8	Sand	SP-SM, SM	A-3, A-1-b, A-2-4	0	0	95-100	95-100	40-75	5-30	0-14	NP
	8-13	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	13-28	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	95-100	40-75	5-30	0-14	NP
	28-51	Sand, loamy sand, sandy loam	SP-SM, SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
	51-80	Sand, loamy sand, sandy loam	SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	95-100	40-75	5-40	0-14	NP
509A: Colonville-----	0-11	Very fine sandy loam	CL-ML	A-4	0	0	100	100	85-95	50-65	0-25	NP-9
	11-16	Very fine sandy loam	ML, SM, SC	A-4, A-1-b, A-2-4	0	0	99-100	99-100	35-85	5-55	0-25	NP-9
	16-80	Stratified fine sand to silt loam to very fine sandy loam	ML, SC, SM	A-1-b, A-2-4, A-4	0	0	99-100	99-100	35-85	5-55	0-30	NP-9
Thunderbay-----	0-10	Silt loam	ML	A-4	0	0	98-100	98-100	85-95	50-65	15-20	NP-15
	10-18	Silt loam	ML	A-4	0	0	98-100	98-100	85-95	50-65	15-20	NP-15
	18-26	Muck	PT	A-8	0	0	---	---	---	---	---	---
	26-37	Stratified silt to silt loam to very fine sandy loam to muck	ML	A-4	0	0	98-100	98-100	85-95	60-75	15-25	NP-25
	37-53	Sand	SM, SP-SM	A-2-4, A-3	0	0	95-100	85-100	40-70	5-15	0-14	NP
	53-80	Gravelly sand	SM, SP-SM	A-3, A-2-4	0	0	95-100	85-100	40-70	5-15	0-14	NP

Table 18.--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	
510: Deerheart-----	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	95-100	90-100	80-100	65-90	25-35	5-15
	6-27	Silty clay loam, clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	65-95	35-50	15-25
	27-43	Silty clay loam, clay loam	CL	A-7, A-6	0	0	95-100	90-100	80-100	65-95	35-50	15-25
	43-80	Stratified silty clay loam to very fine sandy loam to silt to silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	90-100	75-100	50-95	25-50	5-25
511B: Parmalee-----	0-8	Fine sandy loam	CL-ML, CL	A-4	0	0	100	95-100	85-95	50-65	20-30	4-10
	8-18	Fine sandy loam, loam, very fine sandy loam, silty clay loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	50-95	20-40	4-25
	18-22	Loam, silty clay loam	CL	A-4, A-7, A-6	0	0	100	95-100	90-100	80-95	30-45	9-25
	22-33	Silty clay loam, loam	CL	A-4, A-7, A-6	0	0	100	95-100	90-100	80-95	30-45	9-25
	33-51	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	30-95	30-45	10-25
	51-80	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	30-95	30-45	10-25
511C: Parmalee-----	0-8	Fine sandy loam	CL-ML, CL	A-4	0	0	100	95-100	85-95	50-65	20-30	4-10
	8-18	Fine sandy loam, loam, very fine sandy loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	50-95	20-40	4-25
	18-22	Loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	95-100	90-100	80-95	30-45	9-25
	22-33	Silty clay loam, loam	CL	A-4, A-6, A-7	0	0	100	95-100	90-100	80-95	30-45	9-25
	33-51	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	30-95	30-45	10-25
	51-80	Silty clay loam	CL	A-7, A-6	0	0	100	95-100	90-100	30-95	30-45	10-25

Table 18.--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	
512A: Algonquin-----	0-6	Silt loam	CL	A-6, A-4	0	0	99-100	95-100	80-100	70-90	25-40	7-15
	6-15	Clay, silty clay loam, silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	15-18	Silty clay loam, clay, silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	18-35	Silty clay loam, silty clay, stratified silty clay loam to silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
	35-80	Silty clay loam, silty clay, stratified silty clay loam to silty clay	CH, CL	A-7-6	0	0	99-100	95-100	85-100	80-95	40-65	20-40
Springport-----	0-4	Silt loam	CL-ML	A-4, A-6	0	0	97-100	97-100	80-100	70-90	25-40	7-15
	4-9	Silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	9-11	Silty clay, silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	11-16	Silty clay, silty clay loam	CL, CH	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	16-48	Silty clay loam, silty clay	CL, CH	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40
	48-80	Stratified silt loam to silty clay loam	CH, CL	A-7	0	0	97-100	97-100	85-100	80-95	40-65	20-40

Table 18.--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	
513A: Bowers-----	0-8	Loam	CL-ML, CL	A-6, A-4	0	0	100	100	85-100	60-90	25-40	7-16
	8-11	Silty clay loam, sandy loam, loam, clay loam	CL, SC-SM	A-7, A-4	0	0	100	100	90-100	70-95	25-50	7-25
	11-25	Silty clay loam, clay loam	CL	A-7, A-6	0	0	100	100	90-100	70-95	40-50	9-25
	25-45	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-95	40-50	9-25
	45-80	Stratified silty clay loam to silt loam	CL, ML	A-7, A-6, A-4	0	0	100	100	90-100	70-95	35-50	9-25

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
							K	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct					
13:											
Tawas-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	3	8	0
	7-15	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	15-24	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	24-30	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-55	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	55-80	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Lupton-----	0-4	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	4-55	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
	55-80	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
14:											
Dawson-----	0-4	0-0	0.15-0.30	6.00-20.00	0.55-0.65	---	---	---	4	7	38
	4-9	0-0	0.15-0.30	0.20-6.00	0.55-0.65	---	---	---			
	9-32	0-0	0.15-0.40	0.20-6.00	0.35-0.45	---	---	---			
	32-80	0-9	1.55-1.75	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Loxley-----	0-6	0-0	0.30-0.40	6.00-20.00	0.35-0.65	---	---	---	5	8	0
	6-43	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
	43-80	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
15A:											
Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
16B:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
16C:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			

Table 19.--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					
16D:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
17A:											
Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
17B:											
Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
18A:											
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
19:											
Leafriver-----	0-12	---	0.10-0.25	0.60-6.00	0.35-0.50	---	---	---	5	8	0
	12-20	0-9	1.40-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	20-40	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	40-80	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
20B:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
20D:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
20F:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
21D:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-3	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	3-13	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	13-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-39	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	39-46	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	46-80	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
23:											
Ausable-----	0-11	0-0	0.20-0.30	0.60-6.00	0.35-0.45	---	---	---	3	8	0
	11-16	0-9	1.40-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	16-23	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	23-48	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	48-80	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
Bowstring-----	0-13	0-0	0.15-0.30	0.20-6.00	0.35-0.45	---	---	---	3	8	0
	13-32	0-0	0.15-0.30	0.20-6.00	0.35-0.45	---	---	---			
	32-47	0-5	1.40-1.60	6.00-20.00	0.08-0.14	0.0-2.9	.15	.15			
	47-74	0-0	0.15-0.30	0.20-6.00	0.35-0.45	---	---	---			
	74-80	0-5	1.40-1.60	6.00-20.00	0.08-0.14	0.0-2.9	.15	.15			

Table 19.--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					
24A:											
Kinross-----	0-3	0-0	0.20-0.30	0.20-20.00	---	---	---	---	3	2	134
	3-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-14	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-22	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	22-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
26B:											
Cublake-----	0-3	0-5	1.35-1.75	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	3-5	0-5	1.35-1.75	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	5-10	0-9	1.35-1.75	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	10-24	0-5	1.45-1.70	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	24-45	0-5	1.45-1.70	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	45-80	10-26	1.30-1.90	0.20-0.60	0.10-0.21	0.0-2.9	.24	.24			
27A:											
Tacoda-----	0-3	0-5	1.40-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	3-15	0-5	1.40-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-35	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	35-45	0-5	1.45-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	45-80	40-60	1.60-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
31B:											
Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-3	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	3-13	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	13-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-39	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	39-46	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	46-80	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
31C:											
Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-3	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	3-13	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	13-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-39	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	39-46	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	46-80	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
31D:											
Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-3	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	3-13	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	13-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-39	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	39-46	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	46-80	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			

Table 19.--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					
32B: Kellogg-----	0-8	0-10	1.35-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	4	1	220
	8-13	2-12	1.35-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	13-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-28	8-60	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.32	.32			
	28-34	27-60	1.50-1.70	0.00-0.20	0.09-0.17	6.0-8.9	.32	.32			
	34-46	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
	46-80	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
32C: Kellogg-----	0-8	0-10	1.35-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	4	1	220
	8-13	2-12	1.35-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	13-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-28	8-60	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.32	.32			
	28-34	27-60	1.50-1.70	0.00-0.20	0.09-0.17	6.0-8.9	.32	.32			
	34-46	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
	46-80	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
36B: Annalake-----	0-1	5-19	1.25-1.55	0.60-2.00	0.08-0.18	0.0-2.9	.24	.24	5	2	134
	1-3	0-19	1.30-1.60	0.60-2.00	0.08-0.10	0.0-2.9	.24	.24			
	3-8	0-19	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.24	.24			
	8-12	0-19	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.24	.24			
	12-16	5-19	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.24	.24			
	16-21	5-25	1.40-1.70	0.60-2.00	0.10-0.14	0.0-2.9	.32	.32			
	21-41	8-25	1.40-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.32	.32			
	41-80	5-14	1.45-1.70	0.60-2.00	0.10-0.15	0.0-2.9	.24	.24			
37A: Richter-----	0-8	0-10	1.20-1.50	2.00-6.00	0.10-0.12	0.0-2.9	.17	.17	5	2	134
	8-12	0-20	1.35-1.60	0.60-2.00	0.10-0.18	0.0-2.9	.17	.17			
	12-18	0-20	1.35-1.60	0.60-2.00	0.10-0.18	0.0-2.9	.17	.17			
	18-26	0-20	1.35-1.60	0.60-2.00	0.10-0.18	0.0-2.9	.24	.24			
	26-37	10-35	1.60-1.70	0.60-2.00	0.08-0.13	0.0-2.9	.28	.28			
	37-60	2-15	1.60-1.70	0.60-2.00	0.08-0.13	0.0-2.9	.43	.43			
41C: McGinn-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	0-5	1.25-1.40	6.00-20.00	0.11-0.14	0.0-2.9	.17	.17			
	2-4	0-5	1.30-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-16	0-5	1.30-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.17	.17			
	16-18	5-14	1.30-1.65	6.00-20.00	0.10-0.13	0.0-2.9	.17	.17			
	18-21	5-15	1.30-1.65	6.00-20.00	0.10-0.13	0.0-2.9	.17	.17			
	21-25	5-15	1.30-1.65	2.00-6.00	0.10-0.13	0.0-2.9	.28	.28			
	25-35	15-20	1.50-1.75	0.60-2.00	0.12-0.14	0.0-2.9	.28	.28			
	35-80	5-15	1.65-1.80	0.60-2.00	0.11-0.13	0.0-2.9	.28	.28			
44B: Ossineke-----	0-9	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	9-16	11-35	1.60-1.80	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	16-20	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	20-29	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	29-50	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
	50-80	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			

Table 19.--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					
44C:											
Ossineke-----	0-9	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	9-16	11-35	1.60-1.80	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	16-20	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	20-29	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	29-50	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
	50-80	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
47D:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
47F:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
50B:											
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Kinross-----	0-3	0-0	0.20-0.30	0.20-20.00	---	---	---	---	3	2	134
	3-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-14	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-22	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	22-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
51:											
Tawas-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	3	8	0
	7-15	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	15-24	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	24-30	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-55	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	55-80	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Leafriver-----	0-12	---	0.10-0.25	0.60-6.00	0.35-0.50	---	---	---	5	8	0
	12-20	0-9	1.40-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	20-40	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	40-80	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			

Table 19.--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					
53B: Negwegon-----	0-10	12-27	1.40-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	3	5	56
	10-15	12-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	15-23	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	23-34	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	34-80	27-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
53C: Negwegon-----	0-10	12-27	1.40-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	3	5	56
	10-15	12-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	15-23	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	23-34	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	34-80	27-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
54A: Algonquin-----	0-6	15-27	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	3	6	48
	6-15	35-60	1.40-1.60	0.06-0.20	0.11-0.20	6.0-8.9	.32	.32			
	15-18	35-60	1.40-1.60	0.06-0.20	0.11-0.20	6.0-8.9	.32	.32			
	18-35	25-60	1.40-1.60	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	35-80	25-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
56B: Nester-----	0-3	7-26	1.25-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	3-6	5-39	1.25-1.60	0.60-2.00	0.15-0.22	0.0-2.9	.32	.32			
	6-16	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	16-34	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	34-41	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
	41-80	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
56C: Nester-----	0-3	7-26	1.25-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	3-6	5-39	1.25-1.60	0.60-2.00	0.15-0.22	0.0-2.9	.32	.32			
	6-16	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	16-34	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	34-41	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
	41-80	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
57B: Kawkawlin-----	0-10	8-26	1.45-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37	3	5	56
	10-13	8-45	1.45-1.60	0.06-0.20	0.10-0.20	3.0-5.9	.37	.37			
	13-16	35-45	1.45-1.60	0.06-0.20	0.10-0.20	3.0-5.9	.37	.37			
	16-30	30-39	1.50-1.60	0.06-0.20	0.13-0.20	3.0-5.9	.37	.37			
	30-60	30-39	1.50-1.60	0.06-0.20	0.13-0.20	3.0-5.9	.37	.37			
58A: Wakeley-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	4	2	134
	7-22	0-15	1.45-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	22-29	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	29-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
Allendale-----	0-1	---	---	---	---	---	---	---	4	1	220
	1-5	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	5-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-40	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	40-63	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	63-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			

Table 19.--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					
67A:											
Bowers-----	0-8	15-27	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	3	6	48
	8-11	15-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	11-25	35-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	25-45	35-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	45-80	5-40	1.50-1.65	0.06-0.60	0.18-0.22	3.0-5.9	.43	.43			
Deerheart-----	0-6	12-27	1.10-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	5	6	48
	6-27	27-35	1.40-1.70	0.06-0.20	0.15-0.20	3.0-5.9	.43	.43			
	27-43	27-35	1.40-1.70	0.06-0.20	0.15-0.20	3.0-5.9	.43	.43			
	43-80	10-40	1.50-1.75	0.06-0.20	0.08-0.22	3.0-5.9	.43	.43			
70:											
Lupton-----	0-4	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	4-55	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
	55-80	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
71:											
Tawas-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	3	8	0
	7-15	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	15-24	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	24-30	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-55	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	55-80	0-9	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
75B:											
Rubicon-----	0-4	0-5	1.25-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	5	1	220
	4-9	0-5	1.25-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	9-16	0-9	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	16-22	0-9	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	22-47	0-5	1.40-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	47-80	0-5	1.40-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
75D:											
Rubicon-----	0-4	0-5	1.25-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	5	1	220
	4-9	0-5	1.25-1.45	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	9-16	0-9	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	16-22	0-9	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	22-47	0-5	1.40-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	47-80	0-5	1.40-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
78.											
Pits, borrow											
81B:											
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
81D:											
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
81E: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
81F: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
82B. Udorthents											
83B: Udipsamments----	0-7	0-10	1.35-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	5	1	220
	7-13	0-10	1.35-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	13-65	0-10	1.35-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	65-80	0-10	1.35-1.65	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
86: Histosols-----	0-14	---	---	0.20-6.00	0.50-0.70	---	---	---	5	8	0
	14-80	---	---	0.20-6.00	0.50-0.70	---	---	---			
Aquents.											
87: Ausable-----	0-11	0-0	0.20-0.30	0.60-6.00	0.35-0.45	---	---	---	3	8	0
	11-16	0-9	1.40-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	16-23	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	23-48	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
	48-80	0-10	1.30-1.60	6.00-20.00	0.04-0.08	0.0-2.9	.15	.15			
90B: Chinwhisker----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-5	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-10	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	10-21	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	21-29	0-10	1.30-1.55	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	29-80	3-10	1.50-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
93B: Tacoda-----	0-3	0-5	1.40-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	3-15	0-5	1.40-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-35	0-5	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	35-45	0-5	1.45-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	45-80	40-60	1.60-1.70	0.00-0.06	0.08-0.12	6.0-8.9	.32	.32			
Wakeley-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	4	2	134
	7-22	0-15	1.45-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	22-29	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	29-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			

Table 19.--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					
94F:											
Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-3	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	3-13	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	13-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-39	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	39-46	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	46-80	2-15	1.55-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
McGinn-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	0-5	1.25-1.40	6.00-20.00	0.11-0.14	0.0-2.9	.17	.17			
	2-4	0-5	1.30-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-16	0-5	1.30-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.17	.17			
	16-18	5-14	1.30-1.65	6.00-20.00	0.10-0.13	0.0-2.9	.17	.17			
	18-21	5-15	1.30-1.65	6.00-20.00	0.10-0.13	0.0-2.9	.17	.17			
	21-25	5-15	1.30-1.65	2.00-6.00	0.10-0.13	0.0-2.9	.28	.28			
	25-35	15-20	1.50-1.75	0.60-2.00	0.12-0.14	0.0-2.9	.28	.28			
	35-80	5-15	1.65-1.80	0.60-2.00	0.11-0.13	0.0-2.9	.28	.28			
96D2:											
Mongo-----	0-6	27-39	1.40-1.60	0.20-0.60	0.21-0.23	3.0-5.9	.37	.37	3	7	38
	6-10	27-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	10-40	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	40-80	10-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
98C:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
110D:											
Mongo-----	0-7	7-26	1.25-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	3	5	56
	7-16	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	16-23	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	23-44	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	44-80	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
110F:											
Mongo-----	0-7	7-26	1.25-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	3	5	56
	7-16	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	16-23	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	23-44	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	44-80	35-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
111B:											
Kellogg-----	0-4	0-14	1.35-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	4	2	134
	4-6	0-14	1.35-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	6-17	0-14	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-24	0-14	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-27	8-60	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.32	.32			
	27-32	27-60	1.50-1.70	0.00-0.20	0.09-0.17	6.0-8.9	.32	.32			
	32-50	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
	50-80	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			

Table 19.--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					
111C: Kellogg-----	0-4	0-14	1.35-1.60	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	4	1	220
	4-6	0-14	1.35-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	6-17	0-14	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-24	0-14	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-27	8-60	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.32	.32			
	27-32	27-60	1.50-1.70	0.00-0.20	0.09-0.17	6.0-8.9	.32	.32			
	32-50	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
	50-80	27-60	1.60-1.70	0.00-0.20	0.08-0.15	6.0-8.9	.32	.32			
116B: Mancelona-----	0-3	0-5	1.35-1.65	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	4	1	220
	3-6	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	6-16	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	16-20	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	20-29	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	29-35	10-25	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	35-80	0-9	1.45-1.65	6.00-36.00	0.02-0.04	0.0-2.9	.10	.15			
116C: Mancelona-----	0-3	0-5	1.35-1.65	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	4	1	220
	3-6	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	6-16	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	16-20	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	20-29	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	29-35	10-25	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	35-80	0-9	1.45-1.65	6.00-36.00	0.02-0.04	0.0-2.9	.10	.15			
116D: Mancelona-----	0-3	0-5	1.35-1.65	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	4	1	220
	3-6	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	6-16	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	16-20	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	20-29	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	29-35	10-25	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	35-80	0-9	1.45-1.65	6.00-36.00	0.02-0.04	0.0-2.9	.10	.15			
116E: Mancelona-----	0-3	0-5	1.35-1.65	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	4	1	220
	3-6	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	6-16	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	16-20	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	20-29	2-14	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	29-35	10-25	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	35-80	0-9	1.45-1.65	6.00-36.00	0.02-0.04	0.0-2.9	.10	.15			
123D: Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-9	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
125B: Melita-----	0-4	0-9	1.35-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15	5	1	220
	4-8	0-9	1.35-1.60	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	8-16	0-14	1.35-1.60	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	16-43	0-14	1.35-1.60	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	43-47	18-35	1.45-1.70	0.20-0.60	0.14-0.19	0.0-2.9	.32	.32			
	47-80	18-35	1.45-1.70	0.20-0.60	0.13-0.18	0.0-2.9	.32	.32			

Table 19.--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					
144B: Perechenehy-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-12	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	12-21	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	21-28	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.15	.15			
	28-42	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	42-44	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	44-80	0-15	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.17	.17			
144C: Perechenehy-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-12	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	12-21	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	21-28	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.15	.15			
	28-42	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	42-44	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	44-80	0-15	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.17	.17			
200. Borrow source											
210B: Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
210C: Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
210D: Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
210E: Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
211B: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-28	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	28-81	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	81-155	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	155-180	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
211B: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-180	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
211C: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-28	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	28-81	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	81-155	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	155-180	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-180	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
211D: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-28	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	28-81	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	81-155	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	155-180	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-180	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
211E: Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-28	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	28-81	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	81-155	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	155-180	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-180	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
212B: Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
213B: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
213C: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
213D: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
214B: Oxyaquic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-15	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-25	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	25-34	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	34-43	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	43-71	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	71-80	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
215B: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-4	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	4-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-78	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	78-102	27-39	1.50-1.65	6.00-20.00	0.36-0.41	3.0-6.0	.37	.37			
215C: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-4	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	4-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-78	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	78-102	27-39	1.50-1.65	6.00-20.00	0.36-0.41	3.0-6.0	.37	.37			

Table 19.--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					
215D: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-4	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	4-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-78	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	78-102	27-39	1.50-1.65	0.06-0.60	0.36-0.41	3.0-6.0	.37	.37			
220B: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-23	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-41	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	41-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
220C: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-23	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-41	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	41-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
220D: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-23	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-41	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	41-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
220E: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-23	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-41	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	41-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
221B: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-12	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	12-18	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-30	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	30-70	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	70-90	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	90-105	0-19	1.45-1.65	2.00-20.00	0.04-0.06	0.0-6.0	.15	.15			
	105-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
221B: Lamellic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-12	0-10	1.30-1.55	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	12-27	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	27-58	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	58-180	0-19	1.50-1.65	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
221C: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-12	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	12-18	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-30	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	30-70	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	70-90	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	90-105	0-19	1.45-1.65	2.00-20.00	0.04-0.06	0.0-6.0	.15	.15			
	105-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Lamellic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-12	0-10	1.30-1.55	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	12-27	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	27-58	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	58-180	0-19	1.50-1.65	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
221D: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-12	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	12-18	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-30	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	30-70	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	70-90	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	90-105	0-19	1.45-1.65	2.00-20.00	0.04-0.06	0.0-6.0	.15	.15			
	105-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
Lamellic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-12	0-10	1.30-1.55	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	12-27	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	27-58	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	58-180	0-19	1.50-1.65	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
221E: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-12	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	12-18	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-30	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	30-70	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	70-90	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	90-105	0-19	1.45-1.65	2.00-20.00	0.04-0.06	0.0-6.0	.15	.15			
	105-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
221E: Lamellic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-12	0-10	1.30-1.55	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	12-27	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	27-58	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	58-180	0-19	1.50-1.65	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
222B: Typic Udipsamments---	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	3-5	0-10	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-23	0-10	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	23-41	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	41-180	0-10	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
223B: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
223C: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
223D: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			

Table 19.--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					
223E: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Grayling-----	0-4	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	4-18	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-26	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	26-84	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	84-168	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
224B: Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
225B: Entic Haplorthods, sandy-----	0-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.10	.15	5	1	220
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.10	.15			
	3-10	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	10-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-76	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	76-148	0-34	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
	148-180	0-35	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
225C: Entic Haplorthods, sandy-----	0-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.10	.15	5	1	220
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.10	.15			
	3-10	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	10-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-76	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	76-148	0-34	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
	148-180	0-35	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
225D: Entic Haplorthods, sandy-----	0-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.10	.15	5	1	220
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.10	.15			
	3-10	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	10-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-76	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	76-148	0-34	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
	148-180	0-35	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			

Table 19.--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					
225E: Entic Haplorthods, sandy-----	0-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.10	.15	5	1	220
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.10	.15			
	3-10	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	10-26	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	26-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-76	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	76-148	0-34	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
	148-180	0-35	1.50-1.65	0.60-6.00	0.05-0.33	0.0-2.9	.15	.15			
230C: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-23	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	23-30	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	30-180	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2
2-4		0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
4-7		0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
7-11		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
11-32		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
32-37		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
37-42		10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
42-180		0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
230D: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-23	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	23-30	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	30-180	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2
2-4		0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
4-7		0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
7-11		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
11-32		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
32-37		0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
37-42		10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
42-180		0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			

Table 19.--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					
230E: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-23	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	23-30	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	30-180	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
231B: Lamellic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-8	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-14	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-36	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	36-62	0-10	1.50-1.65	2.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	62-180	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
231C: Lamellic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-8	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-14	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-36	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	36-62	0-10	1.50-1.65	2.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	62-180	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			

Table 19.--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					
231C: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
231D: Lamellic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-8	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-14	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-36	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	36-62	0-10	1.50-1.65	2.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	62-180	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
231E: Lamellic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-8	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	8-14	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	14-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-36	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	36-62	0-10	1.50-1.65	2.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	62-180	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			

Table 19.--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					
232B: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-23	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	23-30	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	30-180	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
232D: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-3	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	3-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-23	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	23-30	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	30-180	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
233B: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			

Table 19.--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					
233B: Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	3-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-40	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	40-55	0-34	1.50-1.65	0.60-2.00	0.38-0.43	0.0-2.9	.37	.37			
	55-180	0-34	1.50-1.65	2.00-20.00	0.05-0.43	0.0-2.9	.37	.37			
233C: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	3-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-40	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	40-55	0-34	1.50-1.65	0.60-2.00	0.38-0.43	0.0-2.9	.37	.37			
	55-180	0-34	1.50-1.65	2.00-20.00	0.05-0.43	0.0-2.9	.37	.37			
233D: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	3-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-40	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	40-55	0-34	1.50-1.65	0.60-2.00	0.38-0.43	0.0-2.9	.37	.37			
	55-180	0-34	1.50-1.65	2.00-20.00	0.05-0.43	0.0-2.9	.37	.37			

Table 19.--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					
233E: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Entic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	2-3	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	3-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-24	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	24-40	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	40-55	0-34	1.50-1.65	0.60-2.00	0.38-0.43	0.0-2.9	.37	.37			
	55-180	0-34	1.50-1.65	2.00-20.00	0.05-0.43	0.0-2.9	.37	.37			
234B: Lamellic Oxyaquic Haplorthods, sandy-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-5	0-5	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	5-7	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-10	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	10-16	0-10	1.30-1.55	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	16-27	0-10	1.30-1.55	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-55	0-10	1.30-1.55	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	55-84	3-19	1.50-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
235B: Alfic Haplorthods, sandy over loamy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-6	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-9	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	9-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-44	10-39	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	44-52	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	52-120	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			

Table 19.--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					
235C: Alfic Haplorthods, sandy over loamy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-6	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-9	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	9-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-44	10-39	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	44-52	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	52-120	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
235D: Alfic Haplorthods, sandy over loamy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-6	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-9	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	9-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-44	10-39	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	44-52	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	52-120	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
235E: Alfic Haplorthods, sandy over loamy-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-6	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	6-9	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	9-27	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-44	10-39	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	44-52	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	52-120	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			

Table 19.--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					
235E: Alfic Haplorthods, sandy-----	0-2	---	---	---	---	---	---	---	4	2	134
	2-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	4-7	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	7-11	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	11-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-42	10-22	1.50-1.70	0.20-2.00	0.11-0.18	0.0-2.9	.28	.28			
	42-180	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
236B: Arenic HapludalFs-----	0-2	---	---	---	---	---	---	---	5	2	134
	2-4	0-10	1.35-1.65	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	6-12	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	12-32	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	32-37	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	37-47	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	47-72	0-26	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15			
72-80	0-10	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15				
236C: Arenic HapludalFs-----	0-2	---	---	---	---	---	---	---	5	2	134
	2-4	0-10	1.35-1.65	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	6-12	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	12-32	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	32-37	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	37-47	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	47-72	0-26	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15			
72-80	0-10	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15				
236D: Arenic HapludalFs-----	0-2	---	---	---	---	---	---	---	5	2	134
	2-4	0-10	1.35-1.65	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	6-12	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	12-32	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	32-37	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	37-47	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	47-72	0-26	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15			
72-80	0-10	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15				
236E: Arenic HapludalFs-----	0-2	---	---	---	---	---	---	---	5	2	134
	2-4	0-10	1.35-1.65	6.00-20.00	0.09-0.12	0.0-2.9	.17	.17			
	4-6	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	6-12	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	12-32	0-10	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.17	.17			
	32-37	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	37-47	5-39	1.35-1.70	0.60-2.00	0.10-0.16	0.0-2.9	.24	.24			
	47-72	0-26	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15			
72-80	0-10	1.55-1.65	0.60-20.00	0.04-0.10	0.0-2.9	.10	.15				

Table 19.--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					
237B: Glossudalfs, loamy-----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
237C: Glossudalfs, loamy-----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
237D: Glossudalfs, loamy-----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
237E: Glossudalfs, loamy-----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
247B: Glennie-----	0-2	---	---	---	---	---	---	---	4	3	86
	2-3	2-10	1.35-1.60	2.00-6.00	0.09-0.12	0.0-2.9	.17	.17			
	3-7	2-10	1.35-1.60	2.00-6.00	0.09-0.12	0.0-2.9	.17	.17			
	7-11	5-15	1.35-1.70	2.00-6.00	0.10-0.14	0.0-2.9	.24	.24			
	11-20	5-27	1.35-1.70	0.00-0.06	0.09-0.18	0.0-2.9	.37	.37			
	20-40	5-27	1.80-2.10	0.00-0.06	0.03-0.04	0.0-2.9	.37	.37			
	40-46	5-27	1.80-2.10	0.00-0.06	0.03-0.04	6.0-8.9	.37	.37			
	46-56	20-55	1.80-2.10	0.00-0.06	0.03-0.04	3.0-5.9	.37	.37			
	56-80	20-55	1.80-2.10	0.00-0.06	0.03-0.04	3.0-5.9	.37	.37			
Ossineke-----	0-9	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	9-16	11-35	1.60-1.80	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	16-20	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	20-29	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	29-50	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
	50-80	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			

Table 19.--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					
247C: Glennie-----	0-2	---	---	---	---	---	---	---	4	3	86
	2-3	2-10	1.35-1.60	2.00-6.00	0.09-0.12	0.0-2.9	.17	.17			
	3-7	2-10	1.35-1.60	2.00-6.00	0.09-0.12	0.0-2.9	.17	.17			
	7-11	5-15	1.35-1.70	2.00-6.00	0.10-0.14	0.0-2.9	.24	.24			
	11-20	5-27	1.35-1.70	0.00-0.06	0.09-0.18	0.0-2.9	.37	.37			
	20-40	5-27	1.80-2.10	0.00-0.06	0.03-0.04	0.0-2.9	.37	.37			
	40-46	5-27	1.80-2.10	0.00-0.06	0.03-0.04	6.0-8.9	.37	.37			
	46-56	20-55	1.80-2.10	0.00-0.06	0.03-0.04	3.0-5.9	.37	.37			
	56-80	20-55	1.80-2.10	0.00-0.06	0.03-0.04	3.0-5.9	.37	.37			
Ossineke-----	0-9	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	9-16	11-35	1.60-1.80	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	16-20	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	20-29	18-35	1.60-1.80	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37			
	29-50	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
	50-80	11-28	1.80-2.00	0.06-0.20	0.03-0.04	3.0-5.9	.37	.37			
250D: Glossudalfs----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
Haplosaprists, euc-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	7-13	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	13-25	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	25-30	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-80	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
252A: Haplosaprists, euc-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	7-13	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	13-25	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	25-30	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-80	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
254A: Haplosaprists, euc-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	7-13	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	13-25	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	25-30	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-80	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
Fluvaquents----	0-1	---	---	---	---	---	---	---	-	---	---
	1-6	---	0.30-0.50	0.20-6.00	0.35-0.45	---	---	---			
	6-19	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-34	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-80	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			

Table 19.--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					
254A: Aquic Udipsamments---	0-6	0-5	1.20-1.55	6.00-20.00	0.08-0.10	0.0-2.9	.15	.15	5	1	220
	6-22	0-10	1.40-1.60	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	22-45	0-10	1.50-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	45-80	0-10	1.50-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
262A: Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
264A: Allendale-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-5	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	5-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-40	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	40-63	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	63-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
265B: Glossudalfs-----	0-3	0-10	1.50-1.65	0.60-6.00	0.33-0.38	0.0-2.9	.24	.24	5	3	86
	3-12	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	12-29	0-34	1.50-1.65	0.60-2.00	0.28-0.33	0.0-2.9	.24	.24			
	29-43	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	43-58	0-35	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.17	.17			
	58-84	0-35	1.50-1.65	0.60-20.00	0.05-0.28	0.0-2.9	.17	.17			
Allendale-----	0-1	---	---	---	---	---	---	---	4	2	134
	1-5	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	5-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-40	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	40-63	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	63-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
272: Endoaquods-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	2-8	0-10	1.35-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-13	0-10	1.35-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	13-19	0-10	1.35-1.65	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	19-80	0-10	1.55-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
Fluvaquents-----	0-1	---	---	---	---	---	---	---	5	---	---
	1-6	---	0.30-0.50	0.20-6.00	0.35-0.45	---	---	---			
	6-19	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-34	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	34-80	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
273: Leafriver-----	0-12	---	0.10-0.25	0.60-6.00	0.35-0.50	---	---	---	5	8	0
	12-20	0-9	1.40-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	20-40	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			
	40-80	0-9	1.50-1.65	6.00-20.00	0.03-0.08	0.0-2.9	.15	.15			

Table 19.--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					
273: Wakeley-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	4	2	134
	7-22	0-15	1.45-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	22-29	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	29-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
274: Typic Endoaquods, wet	0-1	---	---	---	---	---	---	---	3	2	134
	1-5	0-0	0.20-0.30	0.60-6.00	0.35-0.45	---	---	---			
	5-11	0-10	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	11-15	0-19	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	15-19	0-19	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-37	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	37-80	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
280: Aquents.											
Histosols-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	7-13	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	13-25	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	25-30	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-80	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
281: Haplosaprists, dysic-----	0-2	0-0	0.30-0.40	6.00-20.00	0.35-0.65	---	---	---	5	8	0
	2-8	0-0	0.30-0.40	6.00-20.00	0.35-0.65	---	---	---			
	8-12	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
	12-36	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
	36-80	0-0	0.10-0.35	0.20-6.00	0.35-0.45	---	---	---			
282: Haplosaprists, euc-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	5	8	0
	7-13	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	13-25	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	25-30	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
	30-80	0-30	1.40-1.65	6.00-20.00	0.03-0.10	0.0-2.9	.15	.15			
307B: Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-9	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
307E: Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			

Table 19.--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					
338B:											
Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
338E:											
Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
352B:											
Deford-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-4	---	0.30-0.50	0.20-6.00	0.35-0.45	---	---	---			
	4-22	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	22-80	0-9	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Au Gres-----	0-4	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15	5	1	220
	4-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-12	0-8	1.50-1.70	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-16	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	16-32	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
Croswell-----	0-2	0-9	1.30-1.55	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15	5	1	220
	2-8	0-9	1.40-1.60	6.00-20.00	0.06-0.10	0.0-2.9	.15	.15			
	8-12	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	12-19	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	19-33	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	33-80	0-9	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
360:											
Wakeley-----	0-7	---	0.30-0.55	0.20-6.00	0.35-0.45	---	---	---	4	2	134
	7-22	0-15	1.45-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	22-29	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	29-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
362B:											
Millersburg-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			

Table 19.--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					
384B:											
Iosco-----	0-3	0-9	1.25-1.40	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15	5	1	220
	3-12	0-9	1.35-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	12-15	0-9	1.35-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	15-18	0-9	1.35-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	18-20	0-10	1.35-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.17	.17			
	20-30	5-35	1.35-1.60	0.60-2.00	0.06-0.20	0.0-2.9	.37	.37			
	30-42	18-35	1.50-1.70	0.20-0.60	0.16-0.20	3.0-5.9	.37	.37			
	42-80	15-35	1.50-1.70	0.20-0.60	0.17-0.20	3.0-5.9	.37	.37			
388B:											
Millersburg----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			
Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
388D:											
Millersburg----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			
Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			

Table 19.--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					
388D: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
388E: Millersburg-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			
	Klackung-----	0-1	---	---	---	---	---	---	---	5	1
1-2		2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
2-3		0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
3-21		0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
21-30		0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
30-41		2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
41-80		0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
390B: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
390D: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			

Table 19.--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					
390D: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
390E: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
390F: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
391B: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
393B: Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	2	134
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			

Table 19.--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					
393C:											
Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	1	220
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
399D:											
Menominee-----	0-4	0-9	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15	5	1	220
	4-7	5-14	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	7-18	5-9	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	18-23	5-9	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	23-39	18-39	1.45-1.70	0.60-2.00	0.14-0.18	3.0-5.9	.32	.32			
	39-59	18-35	1.45-1.70	0.60-2.00	0.14-0.18	3.0-5.9	.32	.32			
	59-80	12-35	1.45-1.75	0.20-0.60	0.13-0.18	3.0-5.9	.37	.37			
Bamfield-----	0-7	5-20	1.30-1.60	2.00-6.00	0.14-0.18	0.0-2.9	.24	.24	4	3	86
	7-12	5-20	1.35-1.70	2.00-6.00	0.11-0.17	0.0-2.9	.24	.24			
	12-18	5-35	1.35-1.80	0.20-2.00	0.11-0.19	0.0-2.9	.24	.24			
	18-26	18-35	1.35-1.65	0.20-0.60	0.13-0.19	3.0-5.9	.37	.37			
	26-39	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	39-53	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	53-79	18-35	1.70-2.00	0.00-0.60	0.03-0.04	3.0-5.9	.32	.37			
	79-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	1	220
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
400F:											
Menominee-----	0-4	0-9	1.35-1.65	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15	5	2	134
	4-7	5-14	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	7-18	5-9	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	18-23	5-9	1.45-1.70	6.00-20.00	0.04-0.10	0.0-2.9	.15	.15			
	23-39	18-39	1.45-1.70	0.60-2.00	0.14-0.18	3.0-5.9	.32	.32			
	39-59	18-35	1.45-1.70	0.60-2.00	0.14-0.18	3.0-5.9	.32	.32			
	59-80	12-35	1.45-1.75	0.20-0.60	0.13-0.18	3.0-5.9	.37	.37			
Bamfield-----	0-7	5-20	1.30-1.60	2.00-6.00	0.14-0.18	0.0-2.9	.24	.24	4	3	86
	7-12	5-20	1.35-1.70	2.00-6.00	0.11-0.17	0.0-2.9	.24	.24			
	12-18	5-35	1.35-1.80	0.20-2.00	0.11-0.19	0.0-2.9	.24	.24			
	18-26	18-35	1.35-1.65	0.20-0.60	0.13-0.19	3.0-5.9	.37	.37			
	26-39	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	39-53	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	53-79	18-35	1.70-2.00	0.00-0.60	0.03-0.04	3.0-5.9	.32	.37			
	79-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	2	134
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			

Table 19.--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					
424B:											
Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	1	220
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
Ossineke-----	0-8	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	8-13	5-20	1.50-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.24	.24			
	13-21	11-27	1.55-1.70	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	21-38	18-35	1.55-1.70	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	38-51	18-35	1.60-1.80	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	51-77	18-35	1.60-1.80	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	77-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	1	220
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
424C:											
Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	1	220
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
Ossineke-----	0-8	5-20	1.30-1.60	0.60-2.00	0.14-0.18	0.0-2.9	.24	.24	5	3	86
	8-13	5-20	1.50-1.70	0.60-2.00	0.13-0.17	0.0-2.9	.24	.24			
	13-21	11-27	1.55-1.70	0.60-2.00	0.14-0.19	0.0-2.9	.24	.24			
	21-38	18-35	1.55-1.70	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	38-51	18-35	1.60-1.80	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	51-77	18-35	1.60-1.80	0.60-2.00	0.14-0.19	3.0-5.9	.37	.37			
	77-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	1	220
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
426B:											
Coppler-----	0-3	---	---	---	---	---	---	---	4	1	220
	3-6	3-9	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	6-14	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	14-20	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	20-26	10-34	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	26-31	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	31-50	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			
	50-80	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			

Table 19.--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					
441B:											
Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	1	220
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
Nester-----	0-3	7-26	1.25-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	4	3	86
	3-6	5-39	1.25-1.60	0.60-2.00	0.15-0.22	0.0-2.9	.32	.32			
	6-16	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	16-34	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	34-41	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
	41-80	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
441C:											
Morganlake-----	0-2	1-10	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.17	.17	5	1	220
	2-5	1-10	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	5-11	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	11-21	1-10	1.40-1.65	6.00-20.00	0.09-0.11	0.0-2.9	.15	.15			
	21-23	1-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	23-28	10-35	1.45-1.70	0.20-2.00	0.14-0.16	3.0-5.9	.37	.37			
	28-33	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
	33-80	10-35	1.45-1.70	0.20-0.60	0.14-0.16	3.0-5.9	.37	.37			
Nester-----	0-3	7-26	1.25-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	4	3	86
	3-6	5-39	1.25-1.60	0.60-2.00	0.15-0.22	0.0-2.9	.32	.32			
	6-16	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	16-34	35-45	1.40-1.60	0.06-0.20	0.08-0.17	3.0-5.9	.32	.32			
	34-41	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
	41-80	30-40	1.40-1.65	0.06-0.20	0.10-0.17	3.0-5.9	.32	.32			
452D:											
Bamfield-----	0-7	5-20	1.30-1.60	2.00-6.00	0.14-0.18	0.0-2.9	.24	.24	4	3	86
	7-12	5-20	1.35-1.70	2.00-6.00	0.11-0.17	0.0-2.9	.24	.24			
	12-18	5-35	1.35-1.80	0.20-2.00	0.11-0.19	0.0-2.9	.24	.24			
	18-26	18-35	1.35-1.65	0.20-0.60	0.13-0.19	3.0-5.9	.37	.37			
	26-39	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	39-53	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	53-79	18-35	1.70-2.00	0.00-0.60	0.03-0.04	3.0-5.9	.32	.37			
	79-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
475B:											
Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			

Table 19.--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					
475D: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
475E: Graycalm-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.55	6.00-20.00	0.04-0.09	0.0-2.9	.15	.15			
	2-3	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	3-7	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	7-17	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	17-24	0-9	1.25-1.60	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15			
	24-80	0-15	1.50-1.65	6.00-20.00	0.04-0.11	0.0-2.9	.15	.15			
Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
476B: Klacking-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Perecheney-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-12	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	12-21	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	21-28	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.15	.15			
	28-42	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	42-44	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	44-80	0-15	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.17	.17			
476D: Klacking-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	2-12	1.35-1.65	6.00-20.00	0.08-0.11	0.0-2.9	.15	.15			
	2-3	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	3-21	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	21-30	0-10	1.35-1.65	6.00-20.00	0.05-0.08	0.0-2.9	.15	.15			
	30-41	2-15	1.55-1.70	2.00-6.00	0.05-0.11	0.0-2.9	.24	.24			
	41-80	0-15	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			

Table 19.--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					
476D:											
Perechenev-----	0-2	---	---	---	---	---	---	---	4	1	220
	2-7	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	7-12	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	12-21	0-10	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	21-28	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.15	.15			
	28-42	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	42-44	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	44-80	0-15	1.40-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.17	.17			
488A:											
Allendale-----	0-1	---	---	---	---	---	---	---	4	1	220
	1-5	0-8	1.30-1.55	6.00-20.00	0.07-0.10	0.0-2.9	.15	.15			
	5-10	0-8	1.50-1.70	6.00-20.00	0.06-0.09	0.0-2.9	.15	.15			
	10-17	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	17-32	0-10	1.50-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	32-40	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	40-63	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
	63-80	35-60	1.50-1.70	0.00-0.20	0.08-0.12	6.0-8.9	.32	.32			
496B:											
Gerrish-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-4	0-9	1.20-1.50	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	4-10	0-9	1.30-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	10-21	0-9	1.30-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.10	.15			
	21-60	0-19	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
	60-80	0-10	1.25-1.60	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Grayling-----	0-1	---	---	---	---	---	---	---	5	1	220
	1-2	0-9	1.30-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	2-7	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	7-15	0-9	1.30-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	15-23	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
	23-80	0-9	1.45-1.65	6.00-20.00	0.04-0.06	0.0-2.9	.15	.15			
503D:											
Bamfield-----	0-7	5-20	1.30-1.60	2.00-6.00	0.14-0.18	0.0-2.9	.24	.24	4	3	86
	7-12	5-20	1.35-1.70	2.00-6.00	0.11-0.17	0.0-2.9	.24	.24			
	12-18	5-35	1.35-1.80	0.20-2.00	0.11-0.19	0.0-2.9	.24	.24			
	18-26	18-35	1.35-1.65	0.20-0.60	0.13-0.19	3.0-5.9	.37	.37			
	26-39	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	39-53	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	53-79	18-35	1.70-2.00	0.00-0.60	0.03-0.04	3.0-5.9	.32	.37			
	79-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Millersburg-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			
Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			

Table 19.--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					
503E:											
Bamfield-----	0-7	5-20	1.30-1.60	2.00-6.00	0.14-0.18	0.0-2.9	.24	.24	4	3	86
	7-12	5-20	1.35-1.70	2.00-6.00	0.11-0.17	0.0-2.9	.24	.24			
	12-18	5-35	1.35-1.80	0.20-2.00	0.11-0.19	0.0-2.9	.24	.24			
	18-26	18-35	1.35-1.65	0.20-0.60	0.13-0.19	3.0-5.9	.37	.37			
	26-39	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	39-53	18-35	1.70-2.00	0.00-0.60	0.14-0.19	3.0-5.9	.32	.37			
	53-79	18-35	1.70-2.00	0.00-0.60	0.03-0.04	3.0-5.9	.32	.37			
	79-80	0-5	1.55-1.65	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
Millersburg-----	0-1	---	---	---	---	---	---	---	5	2	134
	1-2	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	2-4	3-12	1.35-1.65	2.00-20.00	0.10-0.12	0.0-2.9	.17	.17			
	4-8	2-12	1.30-1.70	2.00-20.00	0.05-0.11	0.0-2.9	.17	.17			
	8-12	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	12-14	2-12	1.30-1.70	2.00-20.00	0.07-0.13	0.0-2.9	.17	.17			
	14-27	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	27-34	8-35	1.35-1.70	0.60-2.00	0.10-0.19	0.0-2.9	.24	.24			
	34-76	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.24	.24			
	76-80	3-12	1.55-1.80	0.60-2.00	0.06-0.13	0.0-2.9	.17	.17			
Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
504B:											
Coppler-----	0-3	---	---	---	---	---	---	---	4	1	220
	3-6	3-9	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	6-14	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	14-20	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	20-26	10-34	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	26-31	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	31-50	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			
	50-80	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			
Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
504D:											
Coppler-----	0-3	---	---	---	---	---	---	---	4	1	220
	3-6	3-9	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	6-14	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	14-20	2-9	1.30-1.65	6.00-20.00	0.06-0.12	0.0-2.9	.10	.15			
	20-26	10-34	1.30-1.65	2.00-6.00	0.06-0.16	0.0-2.9	.17	.24			
	26-31	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.10	.15			
	31-50	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			
	50-80	0-9	1.45-1.65	20.00-20.00	0.02-0.04	0.0-2.9	.05	.15			
Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			

Table 19.--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					
505C: Horsehead-----	0-3	0-8	1.30-1.55	6.00-20.00	0.05-0.09	0.0-2.9	.15	.15	4	1	220
	3-11	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.10	.15			
	11-23	0-8	1.30-1.60	6.00-20.00	0.02-0.06	0.0-2.9	.15	.15			
	23-36	5-10	1.30-1.65	6.00-36.00	0.05-0.09	0.0-2.9	.05	.15			
	36-47	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.05	.15			
	47-80	0-8	1.50-1.60	6.00-36.00	0.03-0.07	0.0-2.9	.10	.15			
506B: Durkeelake-----	0-3	---	---	---	---	---	---	---	4	1	220
	3-9	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-13	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	13-25	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	25-31	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	31-33	18-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	33-80	18-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
506C: Durkeelake-----	0-3	---	---	---	---	---	---	---	4	1	220
	3-9	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	9-13	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	13-25	0-9	1.30-1.55	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	25-31	5-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	31-33	18-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
	33-80	18-35	1.35-1.55	0.20-2.00	0.15-0.20	0.0-2.9	.32	.32			
507D: Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
508B: Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	1	220
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
508D: Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			

Table 19.--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					
508D: Blue Lake-----	0-5	---	---	---	---	---	---	---	5	2	134
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
508E: Islandlake-----	0-2	---	---	---	---	---	---	---	5	1	220
	2-7	0-9	1.30-1.55	6.00-20.00	0.07-0.12	0.0-2.9	.15	.15			
	7-10	0-9	1.40-1.65	6.00-20.00	0.07-0.09	0.0-2.9	.15	.15			
	10-18	0-9	1.40-1.65	6.00-20.00	0.06-0.08	0.0-2.9	.15	.15			
	18-27	0-9	1.55-1.65	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	27-80	0-10	1.55-1.65	6.00-20.00	0.05-0.10	0.0-2.9	.15	.15			
Blue Lake-----	0-5	---	---	---	---	---	---	---	5	2	134
	5-8	0-12	1.35-1.60	6.00-20.00	0.10-0.12	0.0-2.9	.15	.15			
	8-13	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	13-28	0-12	1.30-1.60	6.00-20.00	0.06-0.11	0.0-2.9	.15	.15			
	28-51	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
	51-80	0-15	1.30-1.60	2.00-20.00	0.06-0.12	0.0-2.9	.15	.15			
509A: Colonville-----	0-11	10-15	1.35-1.45	2.00-6.00	0.20-0.22	0.0-2.9	.28	.28	5	3	86
	11-16	0-18	1.40-1.65	0.60-6.00	0.02-0.12	0.0-2.9	.15	.15			
	16-80	0-18	1.40-1.65	0.60-6.00	0.02-0.12	0.0-2.9	.15	.15			
Thunderbay-----	0-10	12-26	1.35-1.45	2.00-6.00	0.20-0.22	0.0-2.9	.28	.28	4	3	86
	10-18	12-26	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	.43	.43			
	18-26	---	0.30-0.55	0.20-6.00	0.24-0.45	---	---	---			
	26-37	7-26	1.35-1.50	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32			
	37-53	0-8	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.15	.15			
	53-80	0-8	1.40-1.60	6.00-20.00	0.05-0.07	0.0-2.9	.10	.15			
510: Deerheart-----	0-6	12-27	1.10-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	5	6	48
	6-27	27-35	1.40-1.70	0.06-0.20	0.15-0.20	3.0-5.9	.43	.43			
	27-43	27-35	1.40-1.70	0.06-0.20	0.15-0.20	3.0-5.9	.43	.43			
	43-80	10-40	1.50-1.75	0.06-0.20	0.08-0.22	3.0-5.9	.43	.43			
511B: Parmalee-----	0-8	10-18	1.30-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.24	.24	5	3	86
	8-18	10-30	1.35-1.55	0.20-2.00	0.17-0.22	0.0-2.9	.24	.24			
	18-22	18-35	1.35-1.55	0.20-0.60	0.18-0.22	0.0-2.9	.32	.32			
	22-33	18-35	1.35-1.55	0.20-0.60	0.18-0.22	0.0-2.9	.37	.37			
	33-51	5-35	1.30-1.65	0.06-0.20	0.18-0.22	0.0-2.9	.37	.37			
	51-80	5-35	1.30-1.65	0.06-0.20	0.18-0.22	0.0-2.9	.37	.37			
511C: Parmalee-----	0-8	10-18	1.30-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.24	.24	5	3	86
	8-18	10-30	1.35-1.55	0.20-2.00	0.17-0.22	0.0-2.9	.24	.24			
	18-22	18-35	1.35-1.55	0.20-0.60	0.18-0.22	0.0-2.9	.32	.32			
	22-33	18-35	1.35-1.55	0.20-0.60	0.18-0.22	0.0-2.9	.37	.37			
	33-51	5-35	1.30-1.65	0.06-0.20	0.18-0.22	0.0-2.9	.37	.37			
	51-80	5-35	1.30-1.65	0.06-0.20	0.18-0.22	0.0-2.9	.37	.37			

Table 19.--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					
512A:											
Algonquin-----	0-6	15-27	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	3	6	48
	6-15	35-60	1.40-1.60	0.06-0.20	0.11-0.20	6.0-8.9	.32	.32			
	15-18	35-60	1.40-1.60	0.06-0.20	0.11-0.20	6.0-8.9	.32	.32			
	18-35	25-60	1.40-1.60	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	35-80	25-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
Springport-----	0-4	15-27	1.10-1.40	0.20-0.60	0.22-0.24	0.0-2.9	.37	.37	5	6	48
	4-9	20-60	1.40-1.65	0.06-0.20	0.11-0.20	6.0-8.9	.32	.32			
	9-11	20-60	1.40-1.65	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	11-16	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	16-48	35-60	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
	48-80	12-39	1.40-1.70	0.00-0.06	0.11-0.20	6.0-8.9	.32	.32			
513A:											
Bowers-----	0-8	15-27	1.40-1.70	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	3	6	48
	8-11	15-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	11-25	35-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	25-45	35-40	1.45-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
	45-80	12-40	1.50-1.65	0.06-0.60	0.18-0.22	3.0-5.9	.43	.43			

Table 20.--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
13:						
Tawas-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-15	4.5-7.8	40-100	80-120	60-90	0
	15-24	4.5-7.8	40-100	80-120	60-90	0
	24-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-55	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	55-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
Lupton-----	0-4	6.1-6.5	70-100	140-180	---	0
	4-55	6.1-6.5	70-100	140-180	---	0
	55-80	6.1-6.5	70-100	140-180	---	0
14:						
Dawson-----	0-4	3.6-4.4	65-100	---	80-120	0
	4-9	3.6-4.4	65-100	---	80-120	0
	9-32	3.6-4.4	65-100	---	150-230	0
	32-80	3.5-4.4	0.0-1.0	1.0-2.0	0.8-1.5	0
Loxley-----	0-6	3.5-4.4	70-100	---	50-100	0
	6-43	3.5-4.4	70-100	---	50-120	0
	43-80	3.5-4.4	70-100	---	50-120	0
15A:						
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
16B:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
16C:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0

Table 20.--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
16D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
17A:						
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
17B:						
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
18A:						
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
19:						
Leafriver-----	0-12	4.5-7.3	70-100	100-180	75-135	0
	12-20	4.5-7.3	0.5-5.0	10-50	7.5-38	0
	20-40	4.5-7.3	0.0-0.5	1.0-3.0	0.8-2.3	0
	40-80	4.5-7.8	0.0-0.5	1.0-3.0	0.8-2.3	0
20B:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0

Table 20.--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
20D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0
20F:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0
21D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-3	4.5-6.0	1.0-2.0	2.0-14	1.5-10	0
	3-13	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	13-21	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	21-39	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	39-46	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	46-80	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
23:						
Ausable-----	0-11	5.1-7.3	70-100	140-180	105-135	0
	11-16	6.1-7.8	5.0-50	5.0-25	---	0
	16-23	5.6-7.8	5.0-50	5.0-25	---	0-25
	23-48	5.6-7.8	5.0-50	5.0-25	---	0-25
	48-80	6.1-7.8	5.0-50	5.0-25	---	0-25
Bowstring-----	0-13	5.6-8.4	40-100	100-180	---	0
	13-32	5.6-8.4	40-100	100-180	---	0
	32-47	5.6-8.4	5.0-50	2.0-6.0	---	0
	47-74	5.6-8.4	40-100	100-180	---	0
	74-80	5.6-8.4	0.5-10	1.0-2.0	---	0

Table 20.--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
24A:						
Kinross-----	0-3	3.5-5.5	70-100	---	---	0
	3-10	3.5-5.5	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-14	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	14-22	3.5-6.5	0.5-3.0	1.0-2.0	0.8-1.5	0
	22-80	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
26B:						
Cublake-----	0-3	3.5-6.0	0.5-2.0	1.0-5.0	0.8-3.0	0
	3-5	3.5-6.0	0.5-2.0	1.0-5.0	0.8-3.0	0
	5-10	3.5-6.0	1.0-3.0	1.0-3.0	0.8-2.2	0
	10-24	3.5-6.5	0.0-1.0	1.0-2.0	0.8-1.5	0
	24-45	3.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	45-80	5.1-7.3	0.0-0.5	3.0-10	2.2-7.5	0
27A:						
Tacoda-----	0-3	3.5-5.0	2.0-4.0	---	3.8-7.5	0
	3-15	3.5-5.5	0.0-1.0	2.0-5.0	1.5-3.8	0
	15-23	3.5-5.5	0.5-3.0	2.0-5.0	1.5-3.8	0
	23-35	3.5-5.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	35-45	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	45-80	7.4-8.4	0.0-0.5	20-50	---	10-30
31B:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-3	4.5-6.0	1.0-2.0	2.0-14	1.5-10	0
	3-13	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	13-21	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	21-39	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	39-46	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	46-80	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
31C:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-3	4.5-6.0	1.0-2.0	2.0-14	1.5-10	0
	3-13	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	13-21	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	21-39	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	39-46	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	46-80	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
31D:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-3	4.5-6.0	1.0-2.0	2.0-14	1.5-10	0
	3-13	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	13-21	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	21-39	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	39-46	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	46-80	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0

Table 20.--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
32B:						
Kellogg-----	0-8	4.5-6.0	2.0-5.0	4.0-15	3.0-11	0
	8-13	4.5-6.0	0.5-2.0	1.0-5.0	0.8-3.8	0
	13-17	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-26	4.5-6.0	0.5-2.0	1.0-2.0	0.8-1.5	0
	26-28	6.1-7.8	0.0-0.5	2.0-25	---	0-10
	28-34	6.1-7.8	0.0-0.5	10-25	---	0-10
	34-46	7.4-8.4	0.0-0.5	10-25	---	5-25
	46-80	7.4-8.4	0.0-0.5	10-25	---	5-25
32C:						
Kellogg-----	0-8	4.5-6.0	2.0-5.0	4.0-15	3.0-11	0
	8-13	4.5-6.0	0.5-2.0	1.0-5.0	0.8-3.8	0
	13-17	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-26	4.5-6.0	0.5-2.0	1.0-2.0	0.8-1.5	0
	26-28	6.1-7.8	0.0-0.5	2.0-25	---	0-10
	28-34	6.1-7.8	0.0-0.5	10-25	---	0-10
	34-46	7.4-8.4	0.0-0.5	10-25	---	5-25
	46-80	7.4-8.4	0.0-0.5	10-25	---	5-25
36B:						
Annalake-----	0-1	5.1-7.3	1.0-3.0	3.0-20	2.2-15	0
	1-3	5.1-7.3	0.5-1.0	1.0-15	0.8-11	0
	3-8	5.1-7.3	1.0-2.0	3.0-15	2.2-11	0
	8-12	5.1-7.3	1.0-2.0	3.0-15	2.2-11	0
	12-16	5.1-7.3	0.0-0.5	1.0-15	0.8-11	0
	16-21	5.1-7.3	0.0-0.5	1.0-15	0.8-11	0
	21-41	6.1-7.3	0.0-0.5	2.0-15	---	0
	41-80	6.1-8.4	0.0-0.5	1.0-15	---	0-10
37A:						
Richter-----	0-8	5.1-7.3	2.0-4.0	5.0-10	3.8-7.5	0
	8-12	5.6-7.3	0.5-2.0	5.0-15	---	0
	12-18	5.6-7.3	0.5-3.0	5.0-15	---	0
	18-26	5.6-7.3	0.0-0.5	1.0-15	---	0
	26-37	5.6-7.3	0.0-0.5	1.0-15	---	0
	37-60	6.6-8.4	0.0-0.5	1.0-10	---	0-20
41C:						
McGinn-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	1.0-3.0	5.0-10	3.8-7.5	0
	2-4	4.5-5.5	0.5-1.0	1.0-3.0	0.8-2.3	0
	4-16	5.1-5.5	0.2-1.0	1.0-3.0	0.8-2.3	0
	16-18	4.5-6.0	0.0-0.5	1.0-10	0.8-7.5	0
	18-21	4.5-6.0	0.0-0.5	1.0-10	0.8-7.5	0
	21-25	4.5-6.5	0.0-0.5	1.0-10	0.8-7.5	0
	25-35	4.5-6.5	0.0-0.5	3.0-10	2.3-7.5	0
	35-80	7.4-8.4	0.0-0.5	1.0-5.0	---	10-30
44B:						
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30

Table 20.--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
44C:						
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30
47D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
47F:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
50B:						
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
Kinross-----	0-3	3.5-5.5	70-100	---	---	0
	3-10	3.5-5.5	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-14	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	14-22	3.5-6.5	0.5-3.0	1.0-2.0	0.8-1.5	0
	22-80	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
51:						
Tawas-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-15	4.5-7.8	40-100	80-120	60-90	0
	15-24	4.5-7.8	40-100	80-120	60-90	0
	24-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-55	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	55-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
Leafriver-----	0-12	4.5-7.3	70-100	100-180	75-135	0
	12-20	4.5-7.3	0.5-5.0	10-50	7.5-38	0
	20-40	4.5-7.3	0.0-0.5	1.0-3.0	0.8-2.3	0
	40-80	4.5-7.8	0.0-0.5	1.0-3.0	0.8-2.3	0

Table 20.--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
53B:						
Negwegon-----	0-10	5.6-7.8	1.0-3.0	10-25	---	0
	10-15	5.6-7.8	0.5-1.0	10-20	---	0
	15-23	5.6-7.8	0.0-0.5	10-20	---	0
	23-34	5.6-7.8	0.0-0.5	10-20	---	0-10
	34-80	7.4-8.4	0.0-0.5	10-20	---	20-30
53C:						
Negwegon-----	0-10	5.6-7.8	1.0-3.0	10-25	---	0
	10-15	5.6-7.8	0.5-1.0	10-20	---	0
	15-23	5.6-7.8	0.0-0.5	10-20	---	0
	23-34	5.6-7.8	0.0-0.5	10-20	---	0-10
	34-80	7.4-8.4	0.0-0.5	10-20	---	20-30
54A:						
Algonquin-----	0-6	5.6-7.3	2.0-3.0	10-25	---	0
	6-15	6.1-8.4	0.0-0.5	10-20	---	0-10
	15-18	6.1-8.4	0.0-0.5	10-20	---	0-10
	18-35	7.9-8.4	0.0-0.5	10-20	---	10-30
	35-80	7.9-8.4	0.0-0.5	10-20	---	20-30
56B:						
Nester-----	0-3	5.1-7.3	1.0-3.0	5.0-20	3.8-15	0
	3-6	5.1-7.3	0.5-1.0	2.0-10	1.5-7.5	0
	6-16	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0
	16-34	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0
	34-41	7.4-8.4	0.0-0.5	5.0-20	---	20-30
	41-80	7.4-8.4	0.0-0.5	5.0-20	---	20-30
56C:						
Nester-----	0-3	5.1-7.3	1.0-3.0	5.0-20	3.8-15	0
	3-6	5.1-7.3	0.5-1.0	2.0-10	1.5-7.5	0
	6-16	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0
	16-34	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0
	34-41	7.4-8.4	0.0-0.5	5.0-20	---	20-30
	41-80	7.4-8.4	0.0-0.5	5.0-20	---	20-30
57B:						
Kawkawlin-----	0-10	5.1-7.3	2.0-4.0	5.0-20	3.8-15	0
	10-13	4.5-7.8	0.5-1.0	5.0-20	3.8-15	0
	13-16	5.1-7.8	0.0-0.5	5.0-20	3.8-15	0-20
	16-30	7.4-8.4	0.0-0.5	5.0-15	---	0-30
	30-60	7.9-8.4	0.0-0.5	5.0-15	---	20-30
58A:						
Wakeley-----	0-7	5.6-7.8	40-100	80-120	60-90	0
	7-22	5.6-7.8	0.5-3.0	1.0-10	---	0
	22-29	7.4-8.4	0.0-0.5	5.0-25	---	10-30
	29-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30
Allendale-----	0-1	3.6-7.3	70-100	---	---	0
	1-5	3.6-7.3	2.0-5.0	5.0-10	3.7-7.5	0
	5-10	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-17	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-32	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	32-40	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	40-63	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	63-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30

Table 20.--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
67A:						
Bowers -----	0-8	5.6-7.3	1.0-3.0	5.0-20	---	0
	8-11	5.6-7.3	0.0-1.0	5.0-20	---	0
	11-25	6.1-7.3	0.0-0.5	5.0-20	---	0
	25-45	7.4-8.4	0.0-0.5	5.0-20	---	20-40
	45-80	7.4-8.4	0.0-0.5	5.0-20	---	20-40
Deerheart -----	0-6	6.1-7.3	2.0-5.0	10-20	---	0
	6-27	6.1-7.8	0.0-1.0	5.0-15	---	0-10
	27-43	7.4-8.4	0.0-0.5	5.0-15	---	15-30
	43-80	7.4-8.4	0.0-0.5	3.0-15	---	15-30
70:						
Lupton -----	0-4	6.1-6.5	70-100	140-180	---	0
	4-55	6.1-6.5	70-100	140-180	---	0
	55-80	6.1-6.5	70-100	140-180	---	0
71:						
Tawas -----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-15	4.5-7.8	40-100	80-120	60-90	0
	15-24	4.5-7.8	40-100	80-120	60-90	0
	24-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-55	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	55-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
75B:						
Rubicon -----	0-4	4.5-6.0	2.0-5.0	1.0-6.0	0.8-4.5	0
	4-9	4.5-6.0	0.5-2.0	1.0-6.0	1.0-4.5	0
	9-16	4.5-6.0	0.5-3.0	1.0-4.0	0.8-3.0	0
	16-22	4.5-6.0	0.5-1.0	1.0-4.0	0.8-3.0	0
	22-47	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	47-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
75D:						
Rubicon -----	0-4	4.5-6.0	2.0-5.0	1.0-6.0	0.8-4.5	0
	4-9	4.5-6.0	0.5-2.0	1.0-6.0	1.0-4.5	0
	9-16	4.5-6.0	0.5-3.0	1.0-4.0	0.8-3.0	0
	16-22	4.5-6.0	0.5-1.0	1.0-4.0	0.8-3.0	0
	22-47	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	47-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
78.						
Pits, borrow						
81B:						
Grayling -----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0
81D:						
Grayling -----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0

Table 20.--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
81E:						
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0
81F:						
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	23-80	5.6-7.3	0.0-0.5	1.0-2.0	---	0
82B.						
Udorthents						
83B:						
Udipsamments----	0-7	3.5-8.4	0.0-1.0	0.0-1.0	0.0-0.8	---
	7-13	3.5-8.4	0.0-1.0	0.0-1.0	0.0-0.8	---
	13-65	3.5-8.4	0.0-1.0	0.0-1.0	0.0-0.8	---
	65-80	3.5-8.4	0.0-1.0	0.0-1.0	0.0-0.8	---
86:						
Histosols-----	0-14	---	50-100	---	---	---
	14-80	---	50-100	---	---	---
Aquents.						
87:						
Ausable-----	0-11	5.1-7.3	70-100	140-180	105-135	0
	11-16	6.1-7.8	5.0-50	5.0-25	---	0
	16-23	5.6-7.8	5.0-50	5.0-25	---	0-25
	23-48	5.6-7.8	5.0-50	5.0-25	---	0-25
	48-80	6.1-7.8	5.0-50	5.0-25	---	0-25
90B:						
Chinwhisker-----	0-1	3.5-6.5	70-90	---	---	0
	1-2	3.5-6.5	0.5-2.0	4.0-10	3.0-7.5	0
	2-5	4.5-6.5	0.6-1.0	2.0-3.0	1.5-2.3	0
	5-10	4.5-6.5	0.5-2.0	1.0-2.0	0.8-1.5	0
	10-21	4.5-6.5	0.5-1.0	1.0-2.0	0.8-1.5	0
	21-29	5.1-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	29-80	5.1-8.4	0.0-0.5	2.0-4.0	1.5-3.0	0
93B:						
Tacoda-----	0-3	3.5-5.0	2.0-4.0	---	3.8-7.5	0
	3-15	3.5-5.5	0.0-1.0	2.0-5.0	1.5-3.8	0
	15-23	3.5-5.5	0.5-3.0	2.0-5.0	1.5-3.8	0
	23-35	3.5-5.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	35-45	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	45-80	7.4-8.4	0.0-0.5	20-50	---	10-30
Wakeley-----	0-7	5.6-7.8	40-100	80-120	60-90	0
	7-22	5.6-7.8	0.5-3.0	1.0-10	---	0
	22-29	7.4-8.4	0.0-0.5	5.0-25	---	10-30
	29-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30

Table 20.--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
94F:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-3	4.5-6.0	1.0-2.0	2.0-14	1.5-10	0
	3-13	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	13-21	4.5-7.3	0.0-1.0	2.0-6.0	1.5-4.5	0
	21-39	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	39-46	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	46-80	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
McGinn-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	1.0-3.0	5.0-10	3.8-7.5	0
	2-4	4.5-5.5	0.5-1.0	1.0-3.0	0.8-2.3	0
	4-16	5.1-5.5	0.2-1.0	1.0-3.0	0.8-2.3	0
	16-18	4.5-6.0	0.0-0.5	1.0-10	0.8-7.5	0
	18-21	4.5-6.0	0.0-0.5	1.0-10	0.8-7.5	0
	21-25	4.5-6.5	0.0-0.5	1.0-10	0.8-7.5	0
	25-35	4.5-6.5	0.0-0.5	3.0-10	2.3-7.5	0
	35-80	7.4-8.4	0.0-0.5	1.0-5.0	---	10-30
96D2:						
Mongo-----	0-6	6.6-7.3	0.5-2.0	10-25	---	0
	6-10	6.1-7.3	0.0-0.5	10-20	---	0
	10-40	6.1-7.3	0.0-0.5	10-20	---	0
	40-80	7.4-8.4	0.0-0.5	10-20	---	20-30
98C:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
110D:						
Mongo-----	0-7	6.6-7.3	1.0-3.0	8.0-15	---	0
	7-16	6.1-7.3	0.2-1.0	10-20	---	0
	16-23	6.1-7.8	0.0-0.5	10-20	---	0
	23-44	7.4-8.4	0.0-0.5	10-20	---	10-30
	44-80	7.4-8.4	0.0-0.5	10-20	---	10-30
110F:						
Mongo-----	0-7	6.6-7.3	1.0-3.0	8.0-15	---	0
	7-16	6.1-7.3	0.2-1.0	10-20	---	0
	16-23	6.1-7.8	0.0-0.5	10-20	---	0
	23-44	7.4-8.4	0.0-0.5	10-20	---	10-30
	44-80	7.4-8.4	0.0-0.5	10-20	---	10-30
111B:						
Kellogg-----	0-4	4.5-6.0	2.0-5.0	4.0-15	3.0-11	0
	4-6	4.5-6.0	0.5-2.0	1.0-5.0	0.8-3.8	0
	6-17	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-24	4.5-6.0	0.5-2.0	1.0-2.0	0.8-1.5	0
	24-27	6.1-7.8	0.0-0.5	2.0-25	---	0-10
	27-32	6.1-7.8	0.0-0.5	10-25	---	0-10
	32-50	7.4-8.4	0.0-0.5	10-25	---	5-25
	50-80	7.4-8.4	0.0-0.5	10-25	---	5-25

Table 20.--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	
111C:							
Kellogg-----	0-4	4.5-6.0	2.0-5.0	4.0-15	3.0-11	0	
	4-6	4.5-6.0	0.5-2.0	1.0-5.0	0.8-3.8	0	
	6-17	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0	
	17-24	4.5-6.0	0.5-2.0	1.0-2.0	0.8-1.5	0	
	24-27	6.1-7.8	0.0-0.5	2.0-25	---	0-10	
	27-32	6.1-7.8	0.0-0.5	10-25	---	0-10	
	32-50	7.4-8.4	0.0-0.5	10-25	---	5-25	
	50-80	7.4-8.4	0.0-0.5	10-25	---	5-25	
116B:							
Mancelona-----	0-3	4.5-7.3	1.0-3.0	2.0-10	1.5-7.5	0	
	3-6	4.5-7.8	0.5-2.0	1.0-10	0.8-7.5	0	
	6-16	4.5-7.8	0.5-3.0	1.0-10	0.8-7.5	0	
	16-20	4.5-7.8	0.2-1.0	1.0-10	0.8-7.5	0	
	20-29	4.5-7.8	0.0-0.5	1.0-10	0.8-7.5	0	
	29-35	4.5-7.8	0.0-0.5	4.0-15	3.0-11	0-10	
	35-80	7.4-8.4	0.0-0.5	1.0-4.0	---	10-25	
116C:							
Mancelona-----	0-3	4.5-7.3	1.0-3.0	2.0-10	1.5-7.5	0	
	3-6	4.5-7.8	0.5-2.0	1.0-10	0.8-7.5	0	
	6-16	4.5-7.8	0.5-3.0	1.0-10	0.8-7.5	0	
	16-20	4.5-7.8	0.2-1.0	1.0-10	0.8-7.5	0	
	20-29	4.5-7.8	0.0-0.5	1.0-10	0.8-7.5	0	
	29-35	4.5-7.8	0.0-0.5	4.0-15	3.0-11	0-10	
	35-80	7.4-8.4	0.0-0.5	1.0-4.0	---	10-25	
116D:							
Mancelona-----	0-3	4.5-7.3	1.0-3.0	2.0-10	1.5-7.5	0	
	3-6	4.5-7.8	0.5-2.0	1.0-10	0.8-7.5	0	
	6-16	4.5-7.8	0.5-3.0	1.0-10	0.8-7.5	0	
	16-20	4.5-7.8	0.2-1.0	1.0-10	0.8-7.5	0	
	20-29	4.5-7.8	0.0-0.5	1.0-10	0.8-7.5	0	
	29-35	4.5-7.8	0.0-0.5	4.0-15	3.0-11	0-10	
	35-80	7.4-8.4	0.0-0.5	1.0-4.0	---	10-25	
116E:							
Mancelona-----	0-3	4.5-7.3	1.0-3.0	2.0-10	1.5-7.5	0	
	3-6	4.5-7.8	0.5-2.0	1.0-10	0.8-7.5	0	
	6-16	4.5-7.8	0.5-3.0	1.0-10	0.8-7.5	0	
	16-20	4.5-7.8	0.2-1.0	1.0-10	0.8-7.5	0	
	20-29	4.5-7.8	0.0-0.5	1.0-10	0.8-7.5	0	
	29-35	4.5-7.8	0.0-0.5	4.0-15	3.0-11	0-10	
	35-80	7.4-8.4	0.0-0.5	1.0-4.0	---	10-25	
123D:							
Klacking-----	0-1	4.5-6.0	70-90	---	---	---	
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0	
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0	
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0	
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0	
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0	
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20	
125B:							
Melita-----	0-4	5.1-7.3	3.0-4.0	2.0-5.0	1.5-3.8	0	
	4-8	5.1-7.3	0.5-2.0	1.0-6.0	0.8-4.5	0	
	8-16	5.1-7.3	0.5-3.0	1.0-6.0	0.8-4.5	0	
	16-43	5.1-7.3	0.5-1.0	1.0-6.0	0.8-4.5	0	
	43-47	6.1-7.8	0.0-0.5	5.0-15	---	0-6	
	47-80	7.4-8.4	0.0-0.5	8.0-20	---	15-30	

Table 20.--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
144B:						
Perechenehy-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	7-12	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	12-21	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	21-28	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	28-42	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	42-44	5.6-8.4	0.0-0.5	3.0-15	---	0-10
	44-80	5.6-8.4	0.0-0.5	1.0-5.0	---	0-10
144C:						
Perechenehy-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	7-12	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	12-21	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	21-28	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	28-42	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	42-44	5.6-8.4	0.0-0.5	3.0-15	---	0-10
	44-80	5.6-8.4	0.0-0.5	1.0-5.0	---	0-10
200.						
Borrow source						
210B:						
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
210C:						
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
210D:						
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
210E:						
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
211B:						
Grayling, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-28	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	28-81	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	81-155	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	155-180	5.6-7.3	0.0-0.5	1.0-2.0	---	0

Table 20.--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
211B:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-180	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
211C:						
Grayling, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-28	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	28-81	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	81-155	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	155-180	5.6-7.3	0.0-0.5	1.0-2.0	---	0
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-180	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
211D:						
Grayling, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-28	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	28-81	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	81-155	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	155-180	5.6-7.3	0.0-0.5	1.0-2.0	---	0
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-180	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
211E:						
Grayling, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-28	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	28-81	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	81-155	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	155-180	5.6-7.3	0.0-0.5	1.0-2.0	---	0
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-180	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0

Table 20.--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
212B: Grayling, very deep water table-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
213B: Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
213C: Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
213D: Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
214B: Oxyaquic Udipsamments---	0-1	3.5-5.5	70-90	---	---	---
	1-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	15-25	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	25-34	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	34-43	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-71	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	71-80	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
215B: Typic Udipsamments, loamy substratum-----	0-1	3.5-7.3	70-90	---	---	0
	1-3	3.5-7.3	1.0-5.0	5.0-10	3.8-7.5	0
	3-4	4.5-7.3	0.0-1.0	2.0-5.0	1.5-3.8	0
	4-24	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	24-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-78	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	78-102	5.1-8.4	0.0-0.5	10-15	7.5-11	0

Table 20.--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
215C: Typic Udipsamments, loamy substratum-----	0-1	3.5-7.3	70-90	---	---	0
	1-3	3.5-7.3	1.0-5.0	5.0-10	3.8-7.5	0
	3-4	4.5-7.3	0.0-1.0	2.0-5.0	1.5-3.8	0
	4-24	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	24-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-78	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	78-102	5.1-8.4	0.0-0.5	10-15	7.5-11	0
215D: Typic Udipsamments, loamy substratum-----	0-1	3.5-7.3	70-90	---	---	0
	1-3	3.5-7.3	1.0-5.0	5.0-10	3.8-7.5	0
	3-4	4.5-7.3	0.0-1.0	2.0-5.0	1.5-3.8	0
	4-24	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	24-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-78	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	78-102	5.1-8.4	0.0-0.5	10-15	7.5-11	0
220B: Typic Udipsamments---	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-23	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	23-41	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	41-180	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
220C: Typic Udipsamments---	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-23	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	23-41	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	41-180	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
220D: Typic Udipsamments---	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-23	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	23-41	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	41-180	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
220E: Typic Udipsamments---	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-23	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	23-41	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	41-180	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
221B: Typic Udipsamments, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.0-1.0	2.0-14	1.5-10	0
	5-12	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	12-18	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	18-30	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	30-70	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	70-90	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	90-105	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	105-180	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25
Lamellic Udipsamments---	0-1	4.5-6.5	---	---	---	---
	1-12	4.5-6.5	2.0-5.0	4.0-10	---	0
	12-27	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	27-58	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	58-180	4.5-7.3	0.0-0.5	1.0-5.0	---	0
221C: Typic Udipsamments, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.0-1.0	2.0-14	1.5-10	0
	5-12	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	12-18	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	18-30	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	30-70	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	70-90	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	90-105	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	105-180	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25
Lamellic Udipsamments---	0-1	4.5-6.5	---	---	---	---
	1-12	4.5-6.5	2.0-5.0	4.0-10	---	0
	12-27	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	27-58	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	58-180	4.5-7.3	0.0-0.5	1.0-5.0	---	0
221D: Typic Udipsamments, banded substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.0-1.0	2.0-14	1.5-10	0
	5-12	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	12-18	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	18-30	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	30-70	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	70-90	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	90-105	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	105-180	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25

Table 20.--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
221D:						
Lamellic						
Udipsamments---	0-1	4.5-6.5	---	---	---	---
	1-12	4.5-6.5	2.0-5.0	4.0-10	---	0
	12-27	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	27-58	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	58-180	4.5-7.3	0.0-0.5	1.0-5.0	---	0
221E:						
Typic						
Udipsamments, banded						
substratum-----	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.0-1.0	2.0-14	1.5-10	0
	5-12	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	12-18	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	18-30	3.5-5.5	0.0-1.0	1.0-4.0	0.8-3.0	0
	30-70	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	70-90	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	90-105	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	105-180	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25
Lamellic						
Udipsamments---	0-1	4.5-6.5	---	---	---	---
	1-12	4.5-6.5	2.0-5.0	4.0-10	---	0
	12-27	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	27-58	4.5-7.3	0.5-1.0	2.0-4.0	---	0
	58-180	4.5-7.3	0.0-0.5	1.0-5.0	---	0
222B:						
Typic						
Udipsamments, very deep water						
table-----	0-1	3.5-5.5	70-90	---	---	---
	1-3	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	3-5	3.5-5.5	0.5-1.0	2.0-14	1.5-10	0
	5-23	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	23-41	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
	41-180	4.5-6.5	0.0-0.5	1.0-2.0	0.8-1.5	0
223B:						
Graycalm-----						
	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----						
	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0

Table 20.--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
223C:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
223D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
223E:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Grayling-----	0-4	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	4-18	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	18-26	3.5-5.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	26-84	5.6-7.3	0.0-0.5	1.0-2.0	---	0
	84-168	5.6-7.3	0.0-0.5	1.0-2.0	---	0
224B:						
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
225B:						
Entic						
Haplorthods,						
sandy, loamy						
substratum-----						
	0-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-10	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	10-26	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	26-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-76	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	76-148	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	148-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
225C:						
Entic						
Haplorthods,						
sandy, loamy						
substratum-----						
	0-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-10	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	10-26	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	26-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-76	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	76-148	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	148-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
225D:						
Entic						
Haplorthods,						
sandy, loamy						
substratum-----						
	0-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-10	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	10-26	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	26-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-76	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	76-148	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	148-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
225E:						
Entic						
Haplorthods,						
sandy, loamy						
substratum-----						
	0-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-10	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	10-26	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	26-32	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-76	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	76-148	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	148-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
230C: Entic Haplorthods, sandy-----	0-1	3.6-7.3	70-90	---	---	---
	1-3	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-23	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	23-30	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	30-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
230D: Entic Haplorthods, sandy-----	0-1	3.6-7.3	70-90	---	---	---
	1-3	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-23	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	23-30	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	30-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
230E: Entic Haplorthods, sandy-----	0-1	3.6-7.3	70-90	---	---	---
	1-3	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-23	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	23-30	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	30-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
230E: Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
231B: Lamellic Haplorthods, sandy-----	0-2	5.1-6.5	70-90	---	---	---
	2-3	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-8	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	8-14	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	14-27	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	27-36	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	36-62	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	62-180	5.1-6.5	0.0-0.5	1.0-8.0	---	0
Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
231C: Lamellic Haplorthods, sandy-----	0-2	5.1-6.5	70-90	---	---	---
	2-3	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-8	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	8-14	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	14-27	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	27-36	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	36-62	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	62-180	5.1-6.5	0.0-0.5	1.0-8.0	---	0
Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0

Table 20.--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
231D:						
Lamellic Haplorthods, sandy-----						
	0-2	5.1-6.5	70-90	---	---	---
	2-3	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-8	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	8-14	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	14-27	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	27-36	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	36-62	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	62-180	5.1-6.5	0.0-0.5	1.0-8.0	---	0
Alfic Haplorthods, sandy-----						
	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
231E:						
Lamellic Haplorthods, sandy-----						
	0-2	5.1-6.5	70-90	---	---	---
	2-3	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-8	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	8-14	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	14-27	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	27-36	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	36-62	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	62-180	5.1-6.5	0.0-0.5	1.0-8.0	---	0
Alfic Haplorthods, sandy-----						
	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
232B:						
Entic Haplorthods, sandy, very deep water table-----						
	0-1	3.6-7.3	70-90	---	---	---
	1-3	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-23	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	23-30	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	30-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
232B: Alfic Haplorthods, sandy, very deep water table-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
232D: Entic Haplorthods, sandy, very deep water table-----	0-1	3.6-7.3	70-90	---	---	---
	1-3	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	3-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-23	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	23-30	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	30-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Alfic Haplorthods, sandy, very deep water table-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
233B: Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0

Table 20.--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
233B: Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	3.5-7.3	70-90	---	---	0
	1-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-24	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	24-40	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	40-55	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	55-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
233C: Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
Entic Haplorthods, sandy, fine- loamy banded substratum-----	0-1	3.5-7.3	70-90	---	---	0
	1-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-24	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	24-40	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	40-55	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	55-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
233D: Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0

Table 20.--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
233D:						
Entic						
Haplorthods,						
sandy, fine-						
loamy banded						
substratum-----						
	0-1	3.5-7.3	70-90	---	---	0
	1-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-24	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	24-40	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	40-55	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	55-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
233E:						
Alfic						
Haplorthods,						
sandy-----						
	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
Entic						
Haplorthods,						
sandy, fine-						
loamy banded						
substratum-----						
	0-1	3.5-7.3	70-90	---	---	0
	1-2	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	2-3	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	3-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-24	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	24-40	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	40-55	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	55-180	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
234B:						
Lamellic						
Oxyaquic						
Haplorthods,						
sandy-----						
	0-1	3.5-6.5	70-90	---	---	0
	1-5	3.5-6.5	0.5-2.0	4.0-10	3.0-7.5	0
	5-7	3.5-6.5	0.6-1.0	2.0-3.0	1.5-2.3	0
	7-10	4.5-6.5	0.5-2.0	1.0-2.0	0.8-1.5	0
	10-16	4.5-6.5	0.5-1.0	1.0-2.0	0.8-1.5	0
	16-27	5.1-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	27-55	5.1-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	55-84	5.1-8.4	0.0-0.5	2.0-4.0	1.5-3.0	0

Table 20.--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
235B:						
Alfic						
Haplorthods, sandy over loamy-----						
	0-2	3.5-7.3	70-100	---	---	0
	2-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-6	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	6-9	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	9-27	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	27-44	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	44-52	6.1-8.4	0.0-0.5	1.0-2.0	---	0
	52-120	6.1-8.4	0.0-0.5	1.0-2.0	---	0
Alfic						
Haplorthods, sandy-----						
	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
235C:						
Alfic						
Haplorthods, sandy over loamy-----						
	0-2	3.5-7.3	70-100	---	---	0
	2-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-6	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	6-9	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	9-27	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	27-44	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	44-52	6.1-8.4	0.0-0.5	1.0-2.0	---	0
	52-120	6.1-8.4	0.0-0.5	1.0-2.0	---	0
Alfic						
Haplorthods, sandy-----						
	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
235D:						
Alfic						
Haplorthods, sandy over loamy-----						
	0-2	3.5-7.3	70-100	---	---	0
	2-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-6	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	6-9	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	9-27	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	27-44	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	44-52	6.1-8.4	0.0-0.5	1.0-2.0	---	0
	52-120	6.1-8.4	0.0-0.5	1.0-2.0	---	0

Table 20.--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
235D: Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
235E: Alfic Haplorthods, sandy over loamy-----	0-2	3.5-7.3	70-100	---	---	0
	2-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-6	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	6-9	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	9-27	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	27-44	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	44-52	6.1-8.4	0.0-0.5	1.0-2.0	---	0
	52-120	6.1-8.4	0.0-0.5	1.0-2.0	---	0
Alfic Haplorthods, sandy-----	0-2	3.6-7.3	70-100	---	---	0
	2-4	3.6-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-7	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	7-11	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	11-32	5.1-8.4	0.5-2.0	1.0-2.0	0.8-1.5	0
	32-37	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	37-42	5.1-8.4	0.0-0.5	2.0-10	1.5-7.5	0
	42-180	6.1-8.4	0.0-0.5	1.0-2.0	---	0
236B: Arenic Hapludalfs----	0-2	5.1-6.5	50-90	---	---	---
	2-4	5.1-6.5	1.0-3.0	3.0-10	2.2-7.5	0
	4-6	5.1-6.5	0.5-2.0	1.0-4.0	0.8-3.0	0
	6-12	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	12-32	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	32-37	6.1-7.8	0.5-1.0	1.0-10	---	0
	37-47	6.1-7.8	0.0-0.5	1.0-10	---	0
	47-72	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
72-80	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20	
236C: Arenic Hapludalfs----	0-2	5.1-6.5	50-90	---	---	---
	2-4	5.1-6.5	1.0-3.0	3.0-10	2.2-7.5	0
	4-6	5.1-6.5	0.5-2.0	1.0-4.0	0.8-3.0	0
	6-12	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	12-32	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	32-37	6.1-7.8	0.5-1.0	1.0-10	---	0
	37-47	6.1-7.8	0.0-0.5	1.0-10	---	0
	47-72	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
72-80	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20	

Table 20.--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
236D:						
Arenic						
Hapludalfs-----	0-2	5.1-6.5	50-90	---	---	---
	2-4	5.1-6.5	1.0-3.0	3.0-10	2.2-7.5	0
	4-6	5.1-6.5	0.5-2.0	1.0-4.0	0.8-3.0	0
	6-12	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	12-32	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	32-37	6.1-7.8	0.5-1.0	1.0-10	---	0
	37-47	6.1-7.8	0.0-0.5	1.0-10	---	0
	47-72	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
	72-80	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
236E:						
Arenic						
Hapludalfs-----	0-2	5.1-6.5	50-90	---	---	---
	2-4	5.1-6.5	1.0-3.0	3.0-10	2.2-7.5	0
	4-6	5.1-6.5	0.5-2.0	1.0-4.0	0.8-3.0	0
	6-12	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	12-32	5.1-6.5	0.5-1.0	1.0-4.0	0.8-3.0	0
	32-37	6.1-7.8	0.5-1.0	1.0-10	---	0
	37-47	6.1-7.8	0.0-0.5	1.0-10	---	0
	47-72	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
	72-80	6.1-8.4	0.0-0.5	1.0-4.0	---	0-20
237B:						
Glossudalfs, loamy-----						
	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
237C:						
Glossudalfs, loamy-----						
	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
237D:						
Glossudalfs, loamy-----						
	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
237E:						
Glossudalfs, loamy-----						
	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0

Table 20.--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
247B:						
Glennie-----	0-2	5.1-7.3	40-60	---	---	---
	2-3	5.1-7.3	1.0-3.0	2.0-10	1.5-7.5	0
	3-7	5.1-7.3	1.0-2.0	2.0-10	1.5-7.5	0
	7-11	5.6-7.3	0.0-1.0	2.0-10	1.5-7.5	0
	11-20	5.6-7.3	0.0-0.5	2.0-15	1.5-11	0
	20-40	5.6-7.3	0.0-0.5	2.0-15	1.5-11	0
	40-46	5.6-7.3	0.0-0.5	5.0-20	3.8-15	0
	46-56	5.6-7.3	0.0-0.5	5.0-15	3.8-11	0
	56-80	5.6-7.8	0.0-0.5	5.0-15	3.8-11	10-20
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30
247C:						
Glennie-----	0-2	5.1-7.3	40-60	---	---	---
	2-3	5.1-7.3	1.0-3.0	2.0-10	1.5-7.5	0
	3-7	5.1-7.3	1.0-2.0	2.0-10	1.5-7.5	0
	7-11	5.6-7.3	0.0-1.0	2.0-10	1.5-7.5	0
	11-20	5.6-7.3	0.0-0.5	2.0-15	1.5-11	0
	20-40	5.6-7.3	0.0-0.5	2.0-15	1.5-11	0
	40-46	5.6-7.3	0.0-0.5	5.0-20	3.8-15	0
	46-56	5.6-7.3	0.0-0.5	5.0-15	3.8-11	0
	56-80	5.6-7.8	0.0-0.5	5.0-15	3.8-11	10-20
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30
250D:						
Glossudalfs-----	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Haplosaprists, euic-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-13	4.5-7.8	40-100	80-120	60-90	0
	13-25	4.5-7.8	40-100	80-120	60-90	0
	25-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
252A:						
Haplosaprists, euic-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-13	4.5-7.8	40-100	80-120	60-90	0
	13-25	4.5-7.8	40-100	80-120	60-90	0
	25-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20

Table 20.--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
252A:						
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
254A:						
Haplosaprists, euic-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-13	4.5-7.8	40-100	80-120	60-90	0
	13-25	4.5-7.8	40-100	80-120	60-90	0
	25-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
Fluvaquents-----						
	0-1	4.5-7.8	40-85	---	---	---
	1-6	4.5-7.8	40-100	80-120	60-90	---
	6-19	5.1-8.4	0.0-1.0	1.0-5.0	0.8-3.8	---
	19-34	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
	34-80	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
Aquic Udipsamments---						
	0-6	4.5-6.5	2.0-6.0	5.0-15	3.8-11	0
	6-22	4.5-6.0	0.0-0.5	1.0-2.0	0.8-1.5	0
	22-45	4.5-6.0	0.0-0.5	1.0-2.0	0.8-1.5	0
	45-80	4.5-6.0	0.0-0.5	1.0-2.0	0.8-1.5	0
262A:						
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
264A:						
Allendale-----	0-1	3.6-7.3	70-100	---	---	0
	1-5	3.6-7.3	2.0-5.0	5.0-10	3.7-7.5	0
	5-10	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-17	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-32	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	32-40	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	40-63	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	63-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30
265B:						
Glossudalfs-----	0-3	5.1-8.4	2.0-5.0	1.0-2.0	0.8-1.5	0
	3-12	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	12-29	5.1-8.4	0.2-1.0	1.0-2.0	0.8-1.5	0
	29-43	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	43-58	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	58-84	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
Allendale-----						
	0-1	3.6-7.3	70-100	---	---	0
	1-5	3.6-7.3	2.0-5.0	5.0-10	3.7-7.5	0
	5-10	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-17	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-32	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	32-40	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	40-63	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	63-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30

Table 20.--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
272:						
Endoaquods-----	0-1	5.1-6.5	50-90	---	---	---
	1-2	5.1-6.5	1.0-5.0	3.0-15	2.2-11	0
	2-8	5.1-6.5	0.1-1.0	1.0-4.0	0.8-3.0	0
	8-13	5.1-6.5	1.0-3.0	1.0-4.0	0.8-3.0	0
	13-19	5.1-6.5	0.5-2.0	1.0-4.0	0.8-3.0	0
	19-80	6.1-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
Fluvaquents, occasionally flooded-----						
	0-1	4.5-7.8	40-85	---	---	---
	1-6	4.5-7.8	40-100	80-120	60-90	---
	6-19	5.1-8.4	0.0-1.0	1.0-5.0	0.8-3.8	---
	19-34	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
	34-80	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
273:						
Leafriver-----	0-12	4.5-7.3	70-100	100-180	75-135	0
	12-20	4.5-7.3	0.5-5.0	10-50	7.5-38	0
	20-40	4.5-7.3	0.0-0.5	1.0-3.0	0.8-2.3	0
	40-80	4.5-7.8	0.0-0.5	1.0-3.0	0.8-2.3	0
Wakeley-----	0-7	5.6-7.8	40-100	80-120	60-90	0
	7-22	5.6-7.8	0.5-3.0	1.0-10	---	0
	22-29	7.4-8.4	0.0-0.5	5.0-25	---	10-30
	29-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30
274:						
Typic						
Endoaquods, wet	0-1	3.5-5.5	70-95	---	---	---
	1-5	4.5-6.0	70-100	140-180	105-135	0
	5-11	4.5-6.0	0.5-2.0	2.0-5.0	1.5-3.8	0
	11-15	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	15-19	4.5-7.3	0.0-1.0	1.0-2.0	0.8-1.5	0
	19-37	4.5-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
	37-80	4.5-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
280:						
Aquents.						
Histosols-----	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-13	4.5-7.8	40-100	80-120	60-90	0
	13-25	4.5-7.8	40-100	80-120	60-90	0
	25-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
281:						
Haplosaprists, dysic-----						
	0-2	3.5-4.4	70-100	---	50-100	0
	2-8	3.5-4.4	70-100	---	50-100	0
	8-12	3.5-4.4	70-100	---	50-120	0
	12-36	3.5-4.4	70-100	---	50-120	0
	36-80	3.5-4.4	70-100	---	50-120	0
282:						
Haplosaprists, euic-----						
	0-7	4.5-7.8	40-100	80-120	60-90	0
	7-13	4.5-7.8	40-100	80-120	60-90	0
	13-25	4.5-7.8	40-100	80-120	60-90	0
	25-30	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20
	30-80	5.6-8.4	0.0-5.0	1.0-3.0	---	0-20

Table 20.--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
307B:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
307E:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
338B:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.8-4.5	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0
338E:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.7-4.5	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0
352B:						
Deford-----	0-1	4.5-7.8	40-85	---	---	---
	1-4	4.5-7.8	40-100	80-120	60-90	---
	4-22	5.1-8.4	0.0-1.0	1.0-5.0	0.8-3.8	---
	22-80	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
Croswell-----	0-2	3.6-6.5	1.0-3.0	1.0-5.0	0.8-3.8	0
	2-8	3.6-6.5	0.5-2.0	1.0-3.0	0.8-2.3	0
	8-12	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	12-19	4.5-7.3	0.5-1.0	1.0-2.0	0.8-1.5	0
	19-33	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	33-80	5.1-8.4	0.0-0.5	1.0-2.0	0.8-1.5	0
360:						
Wakeley-----	0-7	5.6-7.8	40-100	80-120	60-90	0
	7-22	5.6-7.8	0.5-3.0	1.0-10	---	0
	22-29	7.4-8.4	0.0-0.5	5.0-25	---	10-30
	29-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30

Table 20.--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
362B:						
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
362D:						
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
362E:						
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
368A:						
Au Gres-----	0-4	3.5-7.3	2.0-5.0	5.0-10	3.8-7.5	0
	4-10	3.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-12	3.5-6.0	2.0-5.0	1.0-2.0	0.8-1.5	0
	12-16	4.5-6.0	0.5-3.0	1.0-2.0	0.8-1.5	0
	16-32	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
	32-80	4.5-7.3	0.0-0.5	1.0-2.0	0.8-1.5	0
Deford-----	0-1	4.5-7.8	40-85	---	---	---
	1-4	4.5-7.8	40-100	80-120	60-90	---
	4-22	5.1-8.4	0.0-1.0	1.0-5.0	0.8-3.8	---
	22-80	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
369:						
Deford-----	0-1	4.5-7.8	40-85	---	---	---
	1-4	4.5-7.8	40-100	80-120	60-90	---
	4-22	5.1-8.4	0.0-1.0	1.0-5.0	0.8-3.8	---
	22-80	5.1-8.4	0.0-0.5	1.0-5.0	0.8-3.8	---
371:						
Springport-----	0-4	6.6-7.8	2.0-5.0	15-30	---	0
	4-9	7.4-8.4	1.0-3.0	10-20	---	0-20
	9-11	7.4-8.4	0.2-1.0	10-20	---	0-20
	11-16	7.4-8.4	0.0-0.5	10-20	---	0-20
	16-48	7.4-8.4	0.0-0.5	10-20	---	20-30
	48-80	7.4-8.4	0.0-0.5	10-20	---	20-30

Table 20.--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
380. Access denied						
384B: Iosco-----	0-3	5.1-7.3	2.0-5.0	2.0-6.0	1.5-4.5	0
	3-12	5.1-7.3	0.5-2.0	2.0-10	1.5-7.5	0
	12-15	5.1-6.0	2.0-4.0	2.0-10	1.5-7.5	0
	15-18	5.1-6.5	0.5-3.0	2.0-10	1.5-7.5	0
	18-20	6.1-7.8	0.0-1.0	2.0-10	---	0
	20-30	6.1-7.8	0.0-1.0	2.0-20	---	0
	30-42	6.1-7.8	0.0-0.5	4.0-20	---	3-6
	42-80	6.6-8.4	0.0-0.5	8.0-20	---	0-30
388B: Millersburg----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	1.5-3.8	0
388D: Millersburg----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20

Table 20.--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
388D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
388E:						
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
Klacking-----						
	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
Graycalm-----						
	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
390B:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
Graycalm-----						
	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
390D:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25

Table 20.--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
390D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
390E:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
Graycalm-----						
	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
390F:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
Graycalm-----						
	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
391B:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
393B:						
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30

Table 20.--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
393C:						
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30
399D:						
Menominee-----	0-4	3.5-6.5	1.0-3.0	2.0-10	1.5-75	---
	4-7	3.5-7.8	0.5-2.0	1.0-6.0	0.8-4.5	---
	7-18	3.5-7.8	1.0-3.0	1.0-6.0	0.8-4.5	---
	18-23	4.5-7.8	0.5-1.0	1.0-6.0	0.8-4.5	---
	23-39	5.1-7.8	0.0-0.5	5.0-20	3.8-15	0-10
	39-59	5.1-7.8	0.0-0.5	5.0-20	3.8-15	0-10
	59-80	7.4-8.4	0.0-0.5	5.0-25	---	20-30
Bamfield, sandy substratum-----	0-7	4.5-6.5	1.0-3.0	5.0-15	3.8-11	0
	7-12	4.5-6.5	0.0-2.0	2.0-10	1.5-7.5	0
	12-18	5.1-6.0	0.0-1.0	2.0-10	1.5-7.5	0
	18-26	5.1-8.4	0.0-0.5	1.0-10	0.8-7.5	0-10
	26-39	5.1-8.4	0.0-0.5	5.0-30	3.8-22	0-30
	39-53	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	53-79	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	79-80	7.9-8.4	0.0-0.5	5.0-25	---	5-25
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
400F:						
Menominee-----	0-4	3.5-6.5	1.0-3.0	2.0-10	1.5-75	---
	4-7	3.5-7.8	0.5-2.0	1.0-6.0	0.8-4.5	---
	7-18	3.5-7.8	1.0-3.0	1.0-6.0	0.8-4.5	---
	18-23	4.5-7.8	0.5-1.0	1.0-6.0	0.8-4.5	---
	23-39	5.1-7.8	0.0-0.5	5.0-20	3.8-15	0-10
	39-59	5.1-7.8	0.0-0.5	5.0-20	3.8-15	0-10
	59-80	7.4-8.4	0.0-0.5	5.0-25	---	20-30
Bamfield, sandy substratum-----	0-7	4.5-6.5	1.0-3.0	5.0-15	3.8-11	0
	7-12	4.5-6.5	0.0-2.0	2.0-10	1.5-7.5	0
	12-18	5.1-6.0	0.0-1.0	2.0-10	1.5-7.5	0
	18-26	5.1-8.4	0.0-0.5	1.0-10	0.8-7.5	0-10
	26-39	5.1-8.4	0.0-0.5	5.0-30	3.8-22	0-30
	39-53	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	53-79	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	79-80	7.9-8.4	0.0-0.5	5.0-25	---	5-25
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0

Table 20.--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
424B:						
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30
Ossineke, sandy substratum-----	0-8	4.5-6.0	1.0-3.0	3.0-14	2.3-10	0
	8-13	5.1-6.0	0.0-0.5	1.0-8.0	0.8-6.0	0
	13-21	5.1-6.0	0.0-0.5	2.0-11	1.5-8.3	0
	21-38	5.6-6.5	0.0-0.5	3.0-14	---	0
	38-51	6.6-8.4	0.0-0.5	3.0-14	---	0-30
	51-77	6.6-8.4	0.0-0.5	3.0-14	---	0-30
	77-80	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
424C:						
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30
Ossineke, sandy substratum-----	0-8	4.5-6.0	1.0-3.0	3.0-14	2.3-10	0
	8-13	5.1-6.0	0.0-0.5	1.0-8.0	0.8-6.0	0
	13-21	5.1-6.0	0.0-0.5	2.0-11	1.5-8.3	0
	21-38	5.6-6.5	0.0-0.5	3.0-14	---	0
	38-51	6.6-8.4	0.0-0.5	3.0-14	---	0-30
	51-77	6.6-8.4	0.0-0.5	3.0-14	---	0-30
	77-80	7.4-8.4	0.0-0.5	1.0-2.0	---	5-25
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
426B:						
Coppler-----	0-3	3.5-7.3	70-90	---	---	---
	3-6	3.5-7.3	0.5-2.0	2.0-7.0	1.5-5.3	0
	6-14	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0
	14-20	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0
	20-26	6.6-7.8	0.0-0.5	4.0-18	---	0-10
	26-31	6.6-9.0	0.0-0.5	1.0-4.0	---	10-25
	31-50	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25
	50-80	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25

Table 20.--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	
441B:							
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0	
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0	
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0	
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0	
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0	
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0	
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30	
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30	
Nester-----	0-3	5.1-7.3	1.0-3.0	5.0-20	3.8-15	0	
	3-6	5.1-7.3	0.5-1.0	2.0-10	1.5-7.5	0	
	6-16	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0	
	16-34	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0	
	34-41	7.4-8.4	0.0-0.5	5.0-20	---	20-30	
	41-80	7.4-8.4	0.0-0.5	5.0-20	---	20-30	
441C:							
Morganlake-----	0-2	3.5-6.0	1.0-3.0	2.0-7.0	1.5-5.3	0	
	2-5	3.5-6.0	0.5-1.0	1.0-7.0	0.8-5.3	0	
	5-11	3.5-6.0	1.0-3.0	1.0-4.0	0.8-3.0	0	
	11-21	3.5-7.3	0.2-1.0	1.0-4.0	0.8-3.0	0	
	21-23	5.6-8.4	0.0-0.5	5.0-20	---	0	
	23-28	5.6-8.4	0.0-0.5	5.0-20	---	0	
	28-33	7.4-8.4	0.0-0.5	5.0-14	---	10-30	
	33-80	7.4-8.4	0.0-0.5	5.0-14	---	10-30	
Nester-----	0-3	5.1-7.3	1.0-3.0	5.0-20	3.8-15	0	
	3-6	5.1-7.3	0.5-1.0	2.0-10	1.5-7.5	0	
	6-16	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0	
	16-34	5.1-7.3	0.0-0.5	5.0-20	3.8-15	0	
	34-41	7.4-8.4	0.0-0.5	5.0-20	---	20-30	
	41-80	7.4-8.4	0.0-0.5	5.0-20	---	20-30	
452D:							
Bamfield, sandy substratum-----	0-7	4.5-6.5	1.0-3.0	5.0-15	3.8-11	0	
	7-12	4.5-6.5	0.0-2.0	2.0-10	1.5-7.5	0	
	12-18	5.1-6.0	0.0-1.0	2.0-10	1.5-7.5	0	
	18-26	5.1-8.4	0.0-0.5	1.0-10	0.8-7.5	0-10	
	26-39	5.1-8.4	0.0-0.5	5.0-30	3.8-22	0-30	
	39-53	7.9-8.4	0.0-0.5	5.0-30	---	10-30	
	53-79	7.9-8.4	0.0-0.5	5.0-30	---	10-30	
	79-80	7.9-8.4	0.0-0.5	5.0-25	---	5-25	
475B:							
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---	
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0	
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0	
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0	
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0	
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0	
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0	
Klacking-----	0-1	4.5-6.0	70-90	---	---	---	
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0	
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0	
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0	
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0	
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0	
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20	

Table 20.--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
475D:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
475E:						
Graycalm-----	0-1	3.5-6.5	70-90	---	---	---
	1-2	3.5-6.5	2.0-5.0	4.0-10	3.0-7.5	0
	2-3	3.5-7.3	0.5-2.0	2.0-4.0	1.5-3.0	0
	3-7	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	7-17	3.5-7.3	0.5-1.0	2.0-4.0	1.5-3.0	0
	17-24	3.5-7.3	0.0-0.5	2.0-4.0	1.5-3.0	0
	24-80	3.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
476B:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
Perechney-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	7-12	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	12-21	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	21-28	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	28-42	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	42-44	5.6-8.4	0.0-0.5	3.0-15	---	0-10
	44-80	5.6-8.4	0.0-0.5	1.0-5.0	---	0-10
476D:						
Klacking-----	0-1	4.5-6.0	70-90	---	---	---
	1-2	4.5-6.0	2.0-5.0	2.0-14	1.5-10	0
	2-3	4.5-6.0	0.5-2.0	2.0-6.0	1.5-4.5	0
	3-21	4.5-7.3	0.5-1.0	2.0-6.0	1.5-4.5	0
	21-30	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	30-41	4.5-7.3	0.0-0.5	2.0-6.0	1.5-4.5	0
	41-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20

Table 20.--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
476D:						
Perecheney-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	7-12	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	12-21	4.5-6.5	0.5-1.0	2.0-10	1.5-7.5	0
	21-28	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	28-42	4.5-6.5	0.0-0.5	3.0-15	2.3-11	0
	42-44	5.6-8.4	0.0-0.5	3.0-15	---	0-10
	44-80	5.6-8.4	0.0-0.5	1.0-5.0	---	0-10
488A:						
Allendale-----	0-1	3.6-7.3	70-100	---	---	0
	1-5	3.6-7.3	2.0-5.0	5.0-10	3.7-7.5	0
	5-10	4.5-7.3	0.5-2.0	2.0-5.0	1.5-3.8	0
	10-17	5.1-8.4	0.5-3.0	1.0-2.0	0.8-1.5	0
	17-32	5.1-8.4	0.5-1.0	1.0-2.0	0.8-1.5	0
	32-40	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	40-63	6.1-8.4	0.5-1.0	5.0-25	---	0-30
	63-80	7.4-8.4	0.0-0.5	5.0-25	---	10-30
496B:						
Gerrish-----	0-2	3.5-6.5	70-90	---	---	---
	2-4	3.5-6.5	1.0-3.0	3.0-7.0	2.3-5.3	0
	4-10	4.5-6.5	0.0-0.5	1.0-4.0	0.8-3.0	0
	10-21	4.5-6.5	0.0-0.5	1.0-4.0	0.8-3.0	0
	21-60	5.1-7.3	0.0-0.5	1.0-4.0	0.8-3.0	0
	60-80	6.6-8.4	0.0-0.5	1.0-4.0	---	0-20
Grayling-----	0-1	3.5-5.5	70-90	---	---	---
	1-2	3.5-5.5	2.0-5.0	2.0-14	1.5-10	0
	2-7	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	7-15	3.5-5.5	0.5-1.0	1.0-4.0	0.8-2.5	0
	15-23	5.6-7.3	0.0-0.5	---	---	0
	23-80	5.6-7.3	0.0-0.5	---	---	0
503D:						
Bamfield, sandy substratum-----	0-7	4.5-6.5	1.0-3.0	5.0-15	3.8-11	0
	7-12	4.5-6.5	0.0-2.0	2.0-10	1.5-7.5	0
	12-18	5.1-6.0	0.0-1.0	2.0-10	1.5-7.5	0
	18-26	5.1-8.4	0.0-0.5	1.0-10	0.8-7.5	0-10
	26-39	5.1-8.4	0.0-0.5	5.0-30	3.8-22	0-30
	39-53	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	53-79	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	79-80	7.9-8.4	0.0-0.5	5.0-25	---	5-25
503D:						
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30

Table 20.--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
503D:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
503E:						
Bamfield, sandy substratum-----	0-7	4.5-6.5	1.0-3.0	5.0-15	3.8-11	0
	7-12	4.5-6.5	0.0-2.0	2.0-10	1.5-7.5	0
	12-18	5.1-6.0	0.0-1.0	2.0-10	1.5-7.5	0
	18-26	5.1-8.4	0.0-0.5	1.0-10	0.8-7.5	0-10
	26-39	5.1-8.4	0.0-0.5	5.0-30	3.8-22	0-30
	39-53	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	53-79	7.9-8.4	0.0-0.5	5.0-30	---	10-30
	79-80	7.9-8.4	0.0-0.5	5.0-25	---	5-25
Millersburg-----						
	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
Horsehead-----						
	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
504B:						
Coppler-----	0-3	3.5-7.3	70-90	---	---	---
	3-6	3.5-7.3	0.5-2.0	2.0-7.0	1.5-5.3	0
	6-14	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0
	14-20	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0
	20-26	6.6-7.8	0.0-0.5	4.0-18	---	0-10
	26-31	6.6-9.0	0.0-0.5	1.0-4.0	---	10-25
	31-50	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25
	50-80	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25
Horsehead-----						
	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25

Table 20.--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	
504D:							
Coppler-----	0-3	3.5-7.3	70-90	---	---	---	---
	3-6	3.5-7.3	0.5-2.0	2.0-7.0	1.5-5.3	0	0
	6-14	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0	0
	14-20	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0	0
	20-26	6.6-7.8	0.0-0.5	4.0-18	---	0-10	0-10
	26-31	6.6-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
	31-50	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
	50-80	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25	10-25
504E:							
Coppler-----	0-3	3.5-7.3	70-90	---	---	---	---
	3-6	3.5-7.3	0.5-2.0	2.0-7.0	1.5-5.3	0	0
	6-14	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0	0
	14-20	5.1-7.3	0.0-1.0	1.0-10	0.8-7.5	0	0
	20-26	6.6-7.8	0.0-0.5	4.0-18	---	0-10	0-10
	26-31	6.6-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
	31-50	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
	50-80	7.4-9.0	0.0-0.5	1.0-4.0	---	10-25	10-25
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25	10-25
505B:							
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30	10-30
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30	10-30

Table 20.--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
505B:						
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
505C:						
Ossineke-----	0-9	5.1-7.3	1.0-3.0	3.0-14	2.3-10	0
	9-16	5.6-8.4	0.5-1.0	2.0-11	---	0
	16-20	5.6-8.4	0.0-0.5	3.0-14	---	0
	20-29	5.6-8.4	0.0-0.5	3.0-14	---	0-10
	29-50	7.4-8.4	0.0-0.5	2.0-14	---	10-30
	50-80	7.4-8.4	0.0-0.5	2.0-14	---	10-30
Millersburg-----	0-1	3.5-7.3	70-90	---	---	---
	1-2	3.5-7.3	1.0-3.0	5.0-20	3.8-20	0
	2-4	3.5-7.3	0.5-2.0	5.0-20	3.8-20	0
	4-8	4.5-7.3	0.5-1.0	1.0-5.0	0.8-3.8	0
	8-12	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	12-14	4.5-7.3	0.0-0.5	1.0-5.0	0.8-3.8	0
	14-27	4.5-7.3	0.0-0.5	2.0-5.0	1.5-3.8	0
	27-34	6.1-7.8	0.0-0.5	2.0-5.0	---	0-10
	34-76	6.1-8.4	0.0-0.5	2.0-5.0	---	0-30
	76-80	7.4-8.4	0.0-0.5	2.0-5.0	---	10-30
Horsehead-----	0-3	5.1-5.5	1.0-3.0	2.0-6.0	1.5-4.5	0
	3-11	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	11-23	5.1-6.5	0.5-1.0	2.0-5.0	1.5-3.8	0
	23-36	5.6-7.3	0.0-0.5	2.0-8.0	---	0-10
	36-47	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
	47-80	7.4-9.0	0.0-0.5	2.0-5.0	---	10-25
506B:						
Durkeelake-----	0-3	4.5-6.0	70-90	---	---	---
	3-9	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	9-13	4.5-6.0	0.5-1.0	2.0-10	1.5-7.5	0
	13-25	4.5-6.0	0.5-1.0	2.0-10	1.5-7.5	0
	25-31	5.1-6.5	0.0-0.5	3.0-18	2.3-11	0
	31-33	5.6-8.4	0.0-0.5	3.0-15	---	0-30
	33-80	5.6-8.4	0.0-0.5	3.0-15	---	0-30
506C:						
Durkeelake-----	0-3	4.5-6.0	70-90	---	---	---
	3-9	4.5-6.0	0.5-2.0	2.0-10	1.5-7.5	0
	9-13	4.5-6.0	0.5-1.0	2.0-10	1.5-7.5	0
	13-25	4.5-6.0	0.5-1.0	2.0-10	1.5-7.5	0
	25-31	5.1-6.5	0.0-0.5	3.0-18	2.3-11	0
	31-33	5.6-8.4	0.0-0.5	3.0-15	---	0-30
	33-80	5.6-8.4	0.0-0.5	3.0-15	---	0-30
507D:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.8-6.8	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0

Table 20.--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
508B:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.8-4.5	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
508D:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.8-4.5	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
508E:						
Islandlake-----	0-2	4.5-6.0	70-90	---	---	---
	2-7	4.5-6.0	0.5-1.0	1.0-9.0	0.8-6.8	0
	7-10	4.5-6.0	2.0-5.0	2.0-10	1.5-7.5	0
	10-18	4.5-6.0	1.0-3.0	1.0-6.0	0.8-4.5	0
	18-27	4.5-6.5	0.5-1.0	1.0-5.0	0.8-3.8	0
	27-80	4.5-7.3	0.0-0.5	1.0-7.0	0.8-5.3	0
Blue Lake-----	0-5	5.1-6.5	70-90	---	---	---
	5-8	5.1-6.5	0.5-2.0	2.0-7.0	---	0
	8-13	5.1-6.0	2.0-5.0	2.0-6.0	---	0
	13-28	5.1-6.0	0.5-3.0	2.0-6.0	---	0
	28-51	5.1-6.5	0.0-0.5	1.0-8.0	---	0
	51-80	5.1-7.8	0.0-0.5	1.0-8.0	---	0
509A:						
Colonville-----	0-11	6.6-8.4	2.0-4.0	5.0-15	---	0
	11-16	7.4-8.4	0.0-1.0	1.0-10	---	0
	16-80	7.4-8.4	0.0-10	1.0-10	---	0
Thunderbay-----	0-10	6.6-7.8	2.0-6.0	5.0-20	---	0-10
	10-18	7.4-8.4	1.0-3.0	5.0-15	---	0-10
	18-26	7.4-8.4	40-100	80-120	---	0
	26-37	7.4-8.4	1.0-3.0	5.0-15	---	0-20
	37-53	7.4-8.4	0.0-1.0	2.0-5.0	---	0-20
	53-80	7.4-8.4	0.0-1.0	2.0-5.0	---	0-20
510:						
Deerheart-----	0-6	6.1-7.3	2.0-5.0	10-20	---	0
	6-27	6.1-7.8	0.0-1.0	5.0-15	---	0-10
	27-43	7.4-8.4	0.0-0.5	5.0-15	---	15-30
	43-80	7.4-8.4	0.0-0.5	3.0-15	---	15-30

Table 20.--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
511B:						
Parmalee-----	0-8	6.6-7.3	1.0-3.0	5.0-15	---	0
	8-18	7.4-7.8	0.2-1.0	2.0-15	---	0
	18-22	6.6-7.8	0.0-0.5	3.0-15	---	0
	22-33	6.6-7.8	0.0-0.5	3.0-15	---	0
	33-51	7.4-8.4	0.0-0.5	1.0-15	---	5-20
	51-80	7.4-8.4	0.0-0.5	1.0-15	---	5-20
511C:						
Parmalee-----	0-8	6.6-7.3	1.0-3.0	5.0-15	---	0
	8-18	7.4-7.8	0.2-1.0	2.0-15	---	0
	18-22	6.6-7.8	0.0-0.5	3.0-15	---	0
	22-33	6.6-7.8	0.0-0.5	3.0-15	---	0
	33-51	7.4-8.4	0.0-0.5	1.0-15	---	5-20
	51-80	7.4-8.4	0.0-0.5	1.0-15	---	5-20
512A:						
Algonquin-----	0-6	5.6-7.3	2.0-3.0	10-25	---	0
	6-15	6.1-8.4	0.0-0.5	10-20	---	0-10
	15-18	6.1-8.4	0.0-0.5	10-20	---	0-10
	18-35	7.9-8.4	0.0-0.5	10-20	---	10-30
	35-80	7.9-8.4	0.0-0.5	10-20	---	20-30
Springport-----	0-4	6.6-7.8	2.0-5.0	15-30	---	0
	4-9	7.4-8.4	1.0-3.0	10-20	---	0-20
	9-11	7.4-8.4	0.2-1.0	10-20	---	0-20
	11-16	7.4-8.4	0.0-0.5	10-20	---	0-20
	16-48	7.4-8.4	0.0-0.5	10-20	---	20-30
	48-80	7.4-8.4	0.0-0.5	10-20	---	20-30
513A:						
Bowers-----	0-8	5.6-7.3	1.0-3.0	5.0-20	---	0
	8-11	5.6-7.3	0.0-1.0	5.0-20	---	0
	11-25	6.1-7.3	0.0-0.5	5.0-20	---	0
	25-45	7.4-8.4	0.0-0.5	5.0-20	---	20-40
	45-80	7.4-8.4	0.0-0.5	5.0-20	---	20-40

Table 21.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
13: Tawas-----	---	---	---	4-15	25-30	High	High	Moderate
Lupton-----	---	---	---	0-40	0-79	High	High	Low
14: Dawson-----	---	---	---	0-16	0-32	High	High	High
Loxley-----	---	---	---	0-40	0-79	High	High	High
15A: Croswell-----	---	---	---	---	---	Low	Low	Moderate
Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
16B: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
16C: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
16D: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
17A: Croswell-----	---	---	---	---	---	Low	Low	Moderate
17B: Croswell-----	---	---	---	---	---	Low	Low	Moderate
18A: Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
19: Leafriver-----	---	---	---	0-6	0-11	High	High	High
20B: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
20D:		In		In	In			
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate
20F:								
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate
21D:								
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
23:								
Ausable-----	---	---	---	0-5	0-11	Moderate	High	Low
Bowstring-----	---	---	---	---	20-30	High	High	Low
24A:								
Kinross-----	---	---	---	---	---	Moderate	High	Moderate
Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
26B:								
Cublake-----	---	---	---	---	---	Low	Low	Moderate
27A:								
Tacoda-----	---	---	---	---	---	Moderate	Low	Moderate
31B:								
Klacking-----	---	---	---	---	---	Low	Low	Moderate
31C:								
Klacking-----	---	---	---	---	---	Low	Low	Moderate
31D:								
Klacking-----	---	---	---	---	---	Low	Low	Moderate
32B:								
Kellogg-----	---	---	---	---	---	Low	High	Moderate
32C:								
Kellogg-----	---	---	---	---	---	Low	High	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
36B: Annalake-----	---	---	---	---	---	Moderate	Moderate	Low
37A: Richter-----	---	---	---	---	---	High	High	Moderate
41C: McGinn-----	---	---	---	---	---	Moderate	Low	Moderate
44B: Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
44C: Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
47D: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
47F: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
50B: Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
Kinross-----	---	---	---	---	---	Moderate	High	Moderate
Croswell-----	---	---	---	---	---	Low	Low	Moderate
51: Tawas-----	---	---	---	4-15	25-30	High	High	Moderate
Leafriver-----	---	---	---	0-6	0-11	High	High	High
53B: Negwegon-----	---	---	---	---	---	Moderate	High	Low
53C: Negwegon-----	---	---	---	---	---	Moderate	High	Low
54A: Algonquin-----	---	---	---	---	---	High	High	Low
56B: Nester-----	---	---	---	---	---	Moderate	High	Low

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
56C: Nester-----	---	---	---	---	---	Moderate	High	Low
57B: Kawkawlin-----	---	---	---	---	---	High	High	Low
58A: Wakeley-----	---	---	---	---	---	Moderate	High	Moderate
Allendale-----	---	---	---	---	---	Moderate	High	Moderate
67A: Bowers-----	---	---	---	---	---	High	High	Low
Deerheart-----	---	---	---	---	---	High	High	Low
70: Lupton-----	---	---	---	0-40	0-79	High	High	Low
71: Tawas-----	---	---	---	4-15	25-30	High	High	Moderate
75B: Rubicon-----	---	---	---	---	---	Low	Low	High
75D: Rubicon-----	---	---	---	---	---	Low	Low	High
78. Pits, borrow								
81B: Grayling-----	---	---	---	---	---	Low	Low	Moderate
81D: Grayling-----	---	---	---	---	---	Low	Low	Moderate
81E: Grayling-----	---	---	---	---	---	Low	Low	Moderate
81F: Grayling-----	---	---	---	---	---	Low	Low	Moderate
82B. Udorthents								

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
83B: Udipsamments-----	---	---	---	---	---	Low	Low	Moderate
86: Histosols-----	---	---	---	0-40	0-79	High	High	Low
Aquents-----	---	---	---	---	---	High	---	---
87: Ausable-----	---	---	---	0-5	0-11	Moderate	High	Low
90B: Chinwhisker-----	---	---	---	---	---	Low	Low	Moderate
93B: Tacoda-----	---	---	---	---	---	Moderate	Low	Moderate
Wakeley-----	---	---	---	---	---	Moderate	High	Moderate
94F: Klacking-----	---	---	---	---	---	Low	Low	Moderate
McGinn-----	---	---	---	---	---	Moderate	Low	Moderate
96D2: Mongo-----	---	---	---	---	---	Moderate	High	Low
98C: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
110D: Mongo-----	---	---	---	---	---	Moderate	High	Low
110F: Mongo-----	---	---	---	---	---	Moderate	High	Low
111B: Kellogg-----	---	---	---	---	---	Low	High	Moderate
111C: Kellogg-----	---	---	---	---	---	Low	High	Moderate
116B: Mancelona-----	---	---	---	---	---	Low	Low	Low

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
116C: Mancelona-----	---	---	---	---	---	Low	Low	Low
116D: Mancelona-----	---	---	---	---	---	Low	Low	Low
116E: Mancelona-----	---	---	---	---	---	Low	Low	Low
123D: Klacking-----	---	---	---	---	---	Low	Low	Moderate
125B: Melita-----	---	---	---	---	---	Low	Low	Moderate
144B: Perechney-----	---	---	---	---	---	Low	Moderate	Moderate
144C: Perechney-----	---	---	---	---	---	Low	Moderate	Moderate
200. Borrow source								
210B: Grayling-----	---	---	---	---	---	Low	Low	Moderate
210C: Grayling-----	---	---	---	---	---	Low	Low	Moderate
210D: Grayling-----	---	---	---	---	---	Low	Low	Moderate
210E: Grayling-----	---	---	---	---	---	Low	Low	Moderate
211B: Grayling, banded substratum-----	---	---	---	---	---	Low	Low	High
Graycalm-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
211C: Grayling, banded substratum-----	---	---	---	---	---	Low	Low	High
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
211D: Grayling, banded substratum-----	---	---	---	---	---	Low	Low	High
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
211E: Grayling, banded substratum-----	---	---	---	---	---	Low	Low	High
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
212B: Grayling, very deep water table-----	---	---	---	---	---	Low	Low	Moderate
213B: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
213C: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
213D: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
214B: Oxyaquic Udipsamments--	---	---	---	---	---	Low	Low	High
215B: Typic Udipsamments, loamy substratum-----	---	---	---	---	---	Low	Low	High
215C: Typic Udipsamments, loamy substratum-----	---	---	---	---	---	Low	Low	High
215D: Typic Udipsamments, loamy substratum-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
				In	In			
220B: Typic Udipsamments-----	---	---	---	---	---	Low	Low	High
220C: Typic Udipsamments-----	---	---	---	---	---	Low	Low	High
220D: Typic Udipsamments-----	---	---	---	---	---	Low	Low	High
220E: Typic Udipsamments-----	---	---	---	---	---	Low	Low	High
221B: Typic Udipsamments, banded substratum-----	---	---	---	---	---	Low	Low	High
Lamellic Udipsamments--	---	---	---	---	---	Low	Low	Moderate
221C: Typic Udipsamments, banded substratum-----	---	---	---	---	---	Low	Low	High
Lamellic Udipsamments--	---	---	---	---	---	Low	Low	Moderate
221D: Typic Udipsamments, banded substratum-----	---	---	---	---	---	Low	Low	High
Lamellic Udipsamments--	---	---	---	---	---	Low	Low	Moderate
221E: Typic Udipsamments, banded substratum-----	---	---	---	---	---	Low	Low	High
Lamellic Udipsamments--	---	---	---	---	---	Low	Low	Moderate
222B: Typic Udipsamments, very deep water table	---	---	---	---	---	Low	Low	High
223B: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
223C: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate
223D: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate
223E: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Grayling-----	---	---	---	---	---	Low	Low	Moderate
224B: Croswell-----	---	---	---	---	---	Low	Low	Moderate
225B: Entic Haplorthods, sandy, loamy substratum-----	---	---	---	---	---	Low	Low	High
225C: Entic Haplorthods, sandy, loamy substratum-----	---	---	---	---	---	Low	Low	High
225D: Entic Haplorthods, sandy, loamy substratum-----	---	---	---	---	---	Low	Low	High
225E: Entic Haplorthods, sandy, loamy substratum-----	---	---	---	---	---	Low	Low	High
230C: Entic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
230D: Entic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
230E: Entic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
231B: Lamellic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
231C: Lamellic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
231D: Lamellic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
231E: Lamellic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
232B:		In		In	In			
Entic Haplorthods, sandy, very deep water table-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy, very deep water table-----	---	---	---	---	---	Low	Low	High
232D:								
Entic Haplorthods, sandy, very deep water table-----	---	---	---	---	---	Low	Low	High
Alfic Haplorthods, sandy, very deep water table-----	---	---	---	---	---	Low	Low	High
233B:								
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Entic Haplorthods, sandy, fine-loamy banded substratum-----	---	---	---	---	---	Low	Low	High
233C:								
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Entic Haplorthods, sandy, fine-loamy banded substratum-----	---	---	---	---	---	Low	Low	High
233D:								
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
Entic Haplorthods, sandy, fine-loamy banded substratum-----	---	---	---	---	---	Low	Low	High
233E:								
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
233E: Entic Haplorthods, sandy, fine-loamy banded substratum-----	---	---	---	---	---	Low	Low	High
234B: Lamellic Oxyaquic Haplorthods, sandy----	---	---	---	---	---	Low	Low	Moderate
235B: Alfic Haplorthods, sandy over loamy-----	---	---	---	---	---	Low	Low	Moderate
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
235C: Alfic Haplorthods, sandy over loamy-----	---	---	---	---	---	Low	Low	Moderate
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
235D: Alfic Haplorthods, sandy over loamy-----	---	---	---	---	---	Low	Low	Moderate
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
235E: Alfic Haplorthods, sandy over loamy-----	---	---	---	---	---	Low	Low	Moderate
Alfic Haplorthods, sandy-----	---	---	---	---	---	Low	Low	High
236B: Arenic Hapludalfs-----	---	---	---	---	---	Low	Low	Moderate
236C: Arenic Hapludalfs-----	---	---	---	---	---	Low	Low	Moderate
236D: Arenic Hapludalfs-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
236E: Arenic Hapludalfs-----	---	---	---	---	---	Low	Low	Moderate
237B: Glossudalfs, loamy-----	---	---	---	---	---	Moderate	Moderate	Moderate
237C: Glossudalfs, loamy-----	---	---	---	---	---	Moderate	Moderate	Moderate
237D: Glossudalfs, loamy-----	---	---	---	---	---	Moderate	Moderate	Moderate
237E: Glossudalfs, loamy-----	---	---	---	---	---	Moderate	Moderate	Moderate
247B: Glennie-----	Fragipan	20-40	Moderately cemented	---	---	Moderate	Moderate	Moderate
Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
247C: Glennie-----	Fragipan	20-40	Moderately cemented	---	---	Moderate	Moderate	Moderate
Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
250D: Glossudalfs-----	---	---	---	---	---	Moderate	Moderate	Moderate
Haplosaprists, euic----	---	---	---	0-12	0-24	High	High	Moderate
252A: Haplosaprists, euic----	---	---	---	0-12	0-24	High	High	Moderate
Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
254A: Haplosaprists, euic----	---	---	---	0-12	0-24	High	High	Moderate
Fluvaquents-----	---	---	---	---	---	---	---	---
Aquic Udipsamments-----	---	---	---	---	---	Moderate	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
		to top				In		
262A: Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
264A: Allendale-----	---	---	---	---	---	Moderate	High	Moderate
265B: Glossudalfs-----	---	---	---	---	---	Moderate	Moderate	Moderate
Allendale-----	---	---	---	---	---	Moderate	High	Moderate
272: Endoaquods. Fluvaquents, occasionally flooded.								
273: Leafriver-----	---	---	---	0-6	0-11	High	High	High
Wakeley-----	---	---	---	---	---	Moderate	High	Moderate
274: Typic Endoaquods, wet--	---	---	---	---	---	Moderate	High	Moderate
280: Aquents-----	---	---	---	---	---	High	---	---
Histosols-----	---	---	---	0-41	0-79	High	---	---
281: Haplosaprists, dysic---	---	---	---	---	---	High	High	High
282: Haplosaprists, euic---	---	---	---	0-12	0-24	High	High	Moderate
307B: Klacking-----	---	---	---	---	---	Low	Low	Moderate
307E: Klacking-----	---	---	---	---	---	Low	Low	Moderate
338B: Islandlake-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
338E: Islandlake-----	---	---	---	---	---	Low	Low	High
352B: Deford-----	---	---	---	---	---	Moderate	Low	Moderate
Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
Croswell-----	---	---	---	---	---	Low	Low	Moderate
360: Wakeley-----	---	---	---	---	---	Moderate	High	Moderate
362B: Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
362D: Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
362E: Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
368A: Au Gres-----	---	---	---	---	---	Moderate	Low	Moderate
Deford-----	---	---	---	---	---	Moderate	Low	Moderate
369: Deford-----	---	---	---	---	---	Moderate	Low	Moderate
371: Springport-----	---	---	---	---	---	High	High	Low
380. Access denied								
384B: Iosco-----	---	---	---	---	---	Moderate	High	Low
388B: Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
388D:		In		In	In			
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
388E:								
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
390B:								
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
390D:								
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
390E:								
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
390F:								
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
Graycalm-----	---	---	---	---	---	Low	Low	Moderate
391B:								
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
393B:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate
393C:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
399D:								
Menominee-----	---	---	---	---	---	Low	Low	Moderate
Bamfield, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
400F:								
Menominee-----	---	---	---	---	---	Low	Low	Moderate
Bamfield, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
424B:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate
Ossineke, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
424C:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate
Ossineke, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
426B:								
Coppler-----	---	---	---	---	---	Low	Low	Low
441B:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate
Nester-----	---	---	---	---	---	Moderate	High	Low
441C:								
Morganlake-----	---	---	---	---	---	Low	Low	Moderate
Nester-----	---	---	---	---	---	Moderate	High	Low

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
452D: Bamfield, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
475B: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
475D: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
475E: Graycalm-----	---	---	---	---	---	Low	Low	Moderate
Klacking-----	---	---	---	---	---	Low	Low	Moderate
476B: Klacking-----	---	---	---	---	---	Low	Low	Moderate
Perechney-----	---	---	---	---	---	Low	Moderate	Moderate
476D: Klacking-----	---	---	---	---	---	Low	Low	Moderate
Perechney-----	---	---	---	---	---	Low	Moderate	Moderate
488A: Allendale-----	---	---	---	---	---	Moderate	High	Moderate
496B: Gerrish-----	---	---	---	---	---	Low	Low	High
Grayling-----	---	---	---	---	---	Low	Low	Moderate
503D: Bamfield, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Horsehead-----	---	---	---	---	---	Low	Low	Moderate

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
503E: Bamfield, sandy substratum-----	---	---	---	---	---	Moderate	Moderate	Moderate
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
504B: Coppler-----	---	---	---	---	---	Low	Low	Low
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
504D: Coppler-----	---	---	---	---	---	Low	Low	Low
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
504E: Coppler-----	---	---	---	---	---	Low	Low	Low
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
505B: Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
505C: Ossineke-----	---	---	---	---	---	Moderate	Moderate	Moderate
Millersburg-----	---	---	---	---	---	Moderate	Low	Moderate
Horsehead-----	---	---	---	---	---	Low	Low	Moderate
506B: Durkeelake-----	---	---	---	---	---	Low	Moderate	Moderate
506C: Durkeelake-----	---	---	---	---	---	Low	Moderate	Moderate
507D: Islandlake-----	---	---	---	---	---	Low	Low	High

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
508B:		In		In	In			
Islandlake-----	---	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
508D:								
Islandlake-----	---	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
508E:								
Islandlake-----	---	---	---	---	---	Low	Low	High
Blue Lake-----	---	---	---	---	---	Low	Low	Moderate
509A:								
Colonville-----	---	---	---	---	---	High	Low	Low
Thunderbay-----	---	---	---	---	---	High	High	Low
510:								
Deerheart-----	---	---	---	---	---	High	High	Low
511B:								
Parmalee-----	---	---	---	---	---	High	Moderate	Low
511C:								
Parmalee-----	---	---	---	---	---	High	Moderate	Low
512A:								
Algonquin-----	---	---	---	---	---	High	High	Low
Springport-----	---	---	---	---	---	High	High	Low
513A:								
Bowers-----	---	---	---	---	---	High	High	Low

Table 22.--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
13:												
Tawas-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Lupton-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
14:												
Dawson-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Loxley-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
15A:												
Croswell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
16B:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
16C: Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
16D: Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
17A: Crowell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---
17B: Crowell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---
18A: Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
19: Leafriver-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
20B:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
20D:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
20F:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
21D:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klackling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
23:												
Ausable-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Bowstring-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
24A:												
Kinross-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
26B:												
Cublake-----	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist --- ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist --- ---	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist
27A:												
Tacoda-----	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-0.5: Moist 0.5-3.5: Wet 3.5-6.5: Moist	0.0-0.5: Moist 0.5-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Moist 1.0-3.5: Wet 3.5-6.5: Moist
31B:												
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
31C: Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
31D: Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
32B: Kellogg-----	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist
32C: Kellogg-----	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist
36B: Annalake-----	0.0-6.5: Moist --- ---	0.0-6.5: Moist --- ---	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-2.5: Moist 2.5-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---
37A: Richter-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
41C: McGinn-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
44B: Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
44C: Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
47D: Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
47F: Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
50B: Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
Kinross-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
50B:												
Croswell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---
51:												
Tawas-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Leafriver-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
53B:												
Negwegon-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
53C:												
Negwegon-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
54A:												
Algonquin-----	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
56B:												
Nester-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry Moist	0.0-1.0: Dry Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
56C:												
Nester-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry Moist	0.0-1.0: Dry Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
57B:												
Kawkawlin-----	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry Moist	0.0-6.5: Moist ---	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist
58A:												
Wakeley-----	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-0.5: Moist 2.0-6.5: Moist	0.0-0.5: Moist 2.0-6.5: Moist	0.0-2.0: Wet Moist ---	0.0-2.0: Wet Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---
Allendale-----	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-2.5: Wet 2.5-6.5: Moist	0.0-0.5: Moist 0.5-2.5: Wet 2.5-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-3.0: Wet 3.0-6.5: Moist
67A:												
Bowers-----	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
67A: Deerheart-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
70: Lupton-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
71: Tawas-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
75B: Rubicon-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
75D: Rubicon-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
78. Pits, borrow												
81B: Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
81D: Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
81E: Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
81F: Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
82B: Udorthents-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
83B: Udipsamments----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
86: Histosols-----	0.0-6.5: Wet											
Aquents-----	0.0-6.0: Wet											
87: Ausable-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
90B: Chinwhisker-----	0.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-3.5: Moist 3.5-6.5: Wet	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-4.5: Moist 4.5-6.5: Wet	0.0-3.0: Moist 3.0-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
93B:												
Tacoda-----	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-1.0: Moist	0.0-1.0: Dry	0.0-1.0: Dry	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist
	1.0-3.5: Wet	1.0-3.5: Wet	1.0-3.5: Wet	0.5-3.5: Wet	0.5-3.5: Wet	1.0-3.5: Wet	1.0-6.5: Moist	1.0-6.5: Moist	1.0-3.5: Wet	1.0-3.5: Wet	1.0-3.5: Wet	1.0-3.5: Wet
	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist	---	---	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist	3.5-6.5: Moist
Wakeley-----	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-0.5: Moist	0.0-0.5: Moist	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet
	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	0.5-2.0: Wet	0.5-2.0: Wet	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist
	---	---	---	---	---	---	2.0-6.5: Moist	2.0-6.5: Moist	---	---	---	---
94F:												
Klacking-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-1.0: Dry	0.0-1.5: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	1.0-6.5: Moist	1.5-6.5: Moist	---	---	---	---
McGinn-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	0.5-6.5: Moist	1.0-6.5: Moist	---	---	---	---
96D2:												
Mongo-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	0.5-6.5: Moist	1.0-6.5: Moist	---	---	---	---
98C:												
Graycalm-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Dry	0.0-3.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	2.0-6.5: Moist	3.0-6.5: Moist	---	---	---	---
110D:												
Mongo-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	0.5-6.5: Moist	1.0-6.5: Moist	---	---	---	---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
110F: Mongo-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
111B: Kellogg-----	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist
111C: Kellogg-----	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist
116B: Mancelona-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
116C: Mancelona-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
116D: Mancelona-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
116E: Mancelona-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
123D:												
Klackings-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
125B:												
Melita-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
144B:												
Perechenny-----	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-6.5: Moist --- ---	0.0-2.5: Dry 2.5-6.5: Moist	0.0-2.5: Dry 2.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist
144C:												
Perechenny-----	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-6.5: Moist --- ---	0.0-2.5: Dry 2.5-6.5: Moist	0.0-2.5: Dry 2.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist
200. Borrow source												
210B:												
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
210C:												
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
210D: Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
210E: Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
211B: Grayling-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
211C: Grayling-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
211D: Grayling-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
211E:												
Grayling-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
212B:												
Grayling, very deep water table-----	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-1.0: Dry 1.0-6.0: Moist 6.0-14.0: Wet	0.0-3.0: Dry 3.0-6.0: Moist 6.0-14.0: Wet	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---	0.0-6.0: Moist 6.0-14.0: Wet ---
213B:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
213C:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
213D:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
214B: Oxyaquic Udipsamments---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-5.0: Moist 5.0-15.0: Wet ---	0.0-2.0: Dry 2.0-6.0: Moist 6.0-15.0: Wet	0.0-3.0: Dry 3.0-6.0: Moist 6.0-15.0: Wet	0.0-5.0: Moist 5.0-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---	0.0-3.5: Moist 3.5-15.0: Wet ---
215B: Typic Udipsamments---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-1.0: Dry 1.0-8.5: Moist	0.0-2.0: Dry 2.0-8.5: Moist	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---
215C: Typic Udipsamments---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-1.0: Dry 1.0-8.5: Moist	0.0-2.0: Dry 2.0-8.5: Moist	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---
215D: Typic Udipsamments---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-1.0: Dry 1.0-8.5: Moist	0.0-2.0: Dry 2.0-8.5: Moist	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---	0.0-8.5: Moist ---
220B: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
220C: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
220D: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
220E: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
221B: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Lamellic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
221C: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Lamellic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
221D: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
221D: Lamellic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
221E: Typic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Lamellic Udipsamments---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
222B: Typic Udipsamments, very deep water table-----	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-2.0: Dry 2.0-6.0: Moist 6.0-15.0: Wet	0.0-3.0: Dry 3.0-6.0: Moist 6.0-15.0: Wet	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---	0.0-6.0: Moist 6.0-15.0: Wet ---
223B: Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
223C:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
223D:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
223E:												
Graycalm-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-2.0: Dry 2.0-15.0: Moist	0.0-3.0: Dry 3.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Grayling-----	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-2.0: Dry 2.0-14.0: Moist	0.0-3.0: Dry 3.0-14.0: Moist	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---	0.0-14.0: Moist ---
224B:												
Croswell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
225B: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
225C: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
225D: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
225E: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
230C: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
230D: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
230E: Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
231B: Lamellic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
231C: Lamellic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
231D: Lamellic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
231E: Lamellic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
232B: Entic Haplorthods, sandy, very deep water table-----	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-1.0:	0.0-2.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	1.0-6.0:	2.0-6.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	6.0-15.0:	6.0-15.0:	---	---	---	---
							Wet	Wet				
Alfic Haplorthods, sandy, very deep water table-----	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-1.0:	0.0-2.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	1.0-6.0:	2.0-6.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	6.0-15.0:	6.0-15.0:	---	---	---	---
							Wet	Wet				
232D: Entic Haplorthods, sandy, very deep water table-----	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-1.0:	0.0-2.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	1.0-6.0:	2.0-6.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	6.0-15.0:	6.0-15.0:	---	---	---	---
							Wet	Wet				
Alfic Haplorthods, sandy, very deep water table-----	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-1.0:	0.0-2.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:	0.0-6.0:
	Moist	Moist	Moist	Moist	Moist	Moist	Dry	Dry	Moist	Moist	Moist	Moist
	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	1.0-6.0:	2.0-6.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:	6.0-15.0:
	Wet	Wet	Wet	Wet	Wet	Wet	Moist	Moist	Wet	Wet	Wet	Wet
	---	---	---	---	---	---	6.0-15.0:	6.0-15.0:	---	---	---	---
							Wet	Wet				

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
233B: Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
233C: Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
233D: Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
233E: Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
Entic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
234B: Lamellic Oxyaquic Haplorthods, sandy-----	0.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-3.5: Moist 3.5-6.5: Wet	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-4.5: Moist 4.5-6.5: Wet	0.0-3.0: Moist 3.0-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet
235B: Alfic Haplorthods, sandy over loamy-----	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-1.0: Dry 1.0-10.0: Moist	0.0-2.0: Dry 2.0-10.0: Moist	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
235C: Alfic Haplorthods, sandy over loamy-----	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-1.0: Dry 1.0-10.0: Moist	0.0-2.0: Dry 2.0-10.0: Moist	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
235D: Alfic Haplorthods, sandy over loamy-----	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-1.0: Dry 1.0-10.0: Moist	0.0-2.0: Dry 2.0-10.0: Moist	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---
235E: Alfic Haplorthods, sandy over loamy-----	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-1.0: Dry 1.0-10.0: Moist	0.0-2.0: Dry 2.0-10.0: Moist	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---	0.0-10.0: Moist ---
Alfic Haplorthods, sandy-----	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-1.0: Dry 1.0-15.0: Moist	0.0-2.0: Dry 2.0-15.0: Moist	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---	0.0-15.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
236B: Arenic Hapludalfs-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
236C: Arenic Hapludalfs-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
236D: Arenic Hapludalfs-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
236E: Arenic Hapludalfs-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
237B: Glossudalfs, loamy-----	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-0.5: Dry 0.5-7.0: Moist	0.0-1.0: Dry 1.0-7.0: Moist	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---
237C: Glossudalfs, loamy-----	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-0.5: Dry 0.5-7.0: Moist	0.0-1.0: Dry 1.0-7.0: Moist	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
237D: Glossudalfs, loamy-----	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-0.5: Dry 0.5-7.0: Moist	0.0-1.0: Dry 1.0-7.0: Moist	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---
237E: Glossudalfs, loamy-----	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-0.5: Dry 0.5-7.0: Moist	0.0-1.0: Dry 1.0-7.0: Moist	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---
247B: Glennie-----	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist
Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
247C: Glennie-----	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist	0.0-3.0: Moist 3.0-3.5: Wet 3.5-6.5: Moist
Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
250D:												
Glossudalfs-----	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-0.5: Dry 0.5-7.0: Moist	0.0-1.0: Dry 1.0-7.0: Moist	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---	0.0-7.0: Moist ---
Haplosaprists, euic-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
252A:												
Haplosaprists, euic-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
254A:												
Haplosaprists, euic-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Fluvaquents-----	0.0-6.0: Wet ---	0.0-6.0: Wet ---	0.0-6.0: Wet ---	0.0-6.0: Wet ---	0.0-6.0: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.0: Wet ---	0.0-6.0: Wet ---	0.0-6.0: Wet ---
Aquic												
Udipsamments---	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.5: Moist 2.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
262A:												
Au Gres-----	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	0.0-1.0: Dry	0.0-2.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.5: Moist
	1.5-6.5: Wet	1.5-6.5: Wet	1.0-6.5: Wet	0.5-6.5: Wet	0.5-6.5: Wet	1.0-6.5: Wet	2.0-6.5: Wet	1.0-3.0: Moist	2.0-6.5: Wet	1.0-6.5: Wet	1.0-6.5: Wet	1.5-6.5: Wet
	---	---	---	---	---	---	---	3.0-6.5: Wet	---	---	---	---
264A:												
Allendale-----	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-2.0: Moist	0.0-6.5: Moist	0.0-1.0: Dry	0.0-2.0: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist
	1.0-3.0: Wet	1.0-3.0: Wet	1.0-3.0: Wet	0.5-2.5: Wet	0.5-2.5: Wet	2.0-3.0: Wet	---	1.0-6.5: Moist	2.0-3.0: Wet	1.0-3.0: Wet	0.5-3.0: Wet	0.5-3.0: Wet
	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	2.5-6.5: Moist	2.5-6.5: Moist	3.0-6.5: Moist	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist
265B:												
Glossudalfs-----	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist	0.0-7.0: Moist
	---	---	---	---	---	---	0.5-7.0: Moist	1.0-7.0: Moist	---	---	---	---
Allendale-----	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist	0.0-2.0: Moist	0.0-6.5: Moist	0.0-1.0: Dry	0.0-2.0: Moist	0.0-1.0: Moist	0.0-0.5: Moist	0.0-0.5: Moist
	1.0-3.0: Wet	1.0-3.0: Wet	1.0-3.0: Wet	0.5-2.5: Wet	0.5-2.5: Wet	2.0-3.0: Wet	---	1.0-6.5: Moist	2.0-3.0: Wet	1.0-3.0: Wet	0.5-3.0: Wet	0.5-3.0: Wet
	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	2.5-6.5: Moist	2.5-6.5: Moist	3.0-6.5: Moist	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist
272:												
Endoaquods-----	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-0.5: Moist	0.0-1.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet
	---	---	---	---	---	0.5-6.5: Wet	1.5-6.5: Wet	2.0-6.5: Wet	2.0-6.5: Wet	---	---	---
Fluvaquents-----	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet
	---	---	---	---	---	1.0-6.5: Wet	1.0-6.5: Wet	1.0-6.5: Wet	1.0-6.5: Wet	---	---	---
273:												
Leafriver-----	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet
	---	---	---	---	---	---	0.5-6.5: Wet	0.5-6.5: Wet	---	---	---	---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
273:												
Wakeley-----	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-0.5: Moist	0.0-0.5: Moist	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet	0.0-2.0: Wet
	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	0.5-2.0: Wet	0.5-2.0: Wet	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist	2.0-6.5: Moist
	---	---	---	---	---	---	2.0-6.5: Moist	2.0-6.5: Moist	---	---	---	---
274:												
Typic												
Endoaquods, wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-0.5: Moist	0.0-1.0: Moist	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet
	---	---	---	---	---	---	0.5-6.5: Wet	1.0-6.5: Wet	---	---	---	---
280:												
Aquents-----	0.0-6.5: Wet											
Histosols-----	0.0-6.0: Wet											
281:												
Haplosaprists, dysic-----	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-1.0: Moist	0.0-6.0: Wet	0.0-6.0: Wet	0.0-6.0: Wet
	---	---	---	---	---	1.0-6.5: Wet	1.0-6.5: Wet	1.0-6.5: Wet	1.0-6.5: Wet	---	---	---
282:												
Haplosaprists, euic-----	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-0.5: Moist	0.0-0.5: Moist	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet	0.0-6.5: Wet
	---	---	---	---	---	---	0.5-6.5: Wet	0.5-6.5: Wet	---	---	---	---
307B:												
Klacking-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-1.0: Dry	0.0-1.5: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	1.0-6.5: Moist	1.5-6.5: Moist	---	---	---	---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
307E:												
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
338B:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
338E:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
352B:												
Deford-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
Croswell-----	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-3.5: Moist 3.5-6.5: Wet ---	0.0-2.0: Dry 2.0-4.0: Moist 4.0-6.5: Wet	0.0-3.0: Dry 3.0-4.5: Moist 4.5-6.5: Wet	0.0-4.5: Moist 4.5-6.5: Wet ---	0.0-3.0: Moist 3.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---
360:												
Wakeley-----	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-0.5: Moist 0.5-2.0: Wet 2.0-6.5: Moist	0.0-0.5: Moist 0.5-2.0: Wet 2.0-6.5: Moist	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---	0.0-2.0: Wet 2.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
362B: Millersburg-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
362D: Millersburg-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
362E: Millersburg-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
368A: Au Gres-----	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
Deford-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
369: Deford-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
371: Springport-----	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist
380. Access denied												

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
384B:												
Iosco-----	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet
388B:												
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
388D:												
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
388E:												
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
388E:												
Klackings-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
390B:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
390D:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
390E:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
390F:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
391B:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
393B:												
Morganlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
393C:												
Morganlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
399D:												
Menominee-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Bamfield-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
399D:												
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
400F:												
Menominee-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Bamfield-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
424B:												
Morganlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
424C:												
Morganlake-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-2.0: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist
	---	---	2.0-3.0: Wet	2.0-3.0: Wet	2.0-3.0: Wet	---	0.5-6.5: Moist	1.0-6.5: Moist	2.0-3.0: Wet	2.0-3.0: Wet	2.0-3.0: Wet	---
	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---
Ossineke-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Moist	0.0-1.5: Moist	0.0-1.5: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist
	---	---	2.0-3.0: Wet	1.5-3.0: Wet	1.5-3.0: Wet	---	0.5-6.5: Moist	1.0-6.5: Moist	---	2.0-3.0: Wet	2.0-3.0: Wet	---
	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---	---	---	---	3.0-6.5: Moist	3.0-6.5: Moist	---
Blue Lake-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	0.5-6.5: Moist	1.0-6.5: Moist	---	---	---	---
426B:												
Coppler-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Dry	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist	0.0-6.5: Moist
	---	---	---	---	---	---	2.0-6.5: Moist	---	---	---	---	---
441B:												
Morganlake-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-2.0: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist
	---	---	2.0-3.0: Wet	2.0-3.0: Wet	2.0-3.0: Wet	---	0.5-6.5: Moist	1.0-6.5: Moist	2.0-3.0: Wet	2.0-3.0: Wet	2.0-3.0: Wet	---
	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---
Nester-----	0.0-6.5: Moist	0.0-6.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist	0.0-0.5: Dry	0.0-1.0: Dry	0.0-6.5: Moist	0.0-2.0: Moist	0.0-2.0: Moist	0.0-6.5: Moist
	---	---	2.0-3.0: Wet	2.0-3.0: Wet	2.0-3.0: Wet	---	0.5-6.5: Moist	1.0-6.5: Moist	---	2.0-3.0: Wet	2.0-3.0: Wet	---
	---	---	3.0-6.5: Moist	3.0-6.5: Moist	3.0-6.5: Moist	---	---	---	---	3.0-6.5: Moist	3.0-6.5: Moist	---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
441C:												
Morganlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
Nester-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
452D:												
Bamfield-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
475B:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
475D:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
475E:												
Graycalm-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
476B:												
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Perecheney-----	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist	0.0-2.5: Dry 2.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist
476D:												
Klacking-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-1.5: Dry 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Perecheney-----	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist	0.0-2.5: Dry 2.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist	0.0-2.5: Moist 2.5-6.0: Wet 6.0-6.5: Moist
488A:												
Allendale-----	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-2.5: Wet 2.5-6.5: Moist	0.0-0.5: Moist 0.5-2.5: Wet 2.5-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.0: Moist 1.0-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-3.0: Wet 3.0-6.5: Moist	0.0-0.5: Moist 0.5-3.0: Wet 3.0-6.5: Moist

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
496B:												
Gerrish-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Grayling-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
503D:												
Bamfield-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
503E:												
Bamfield-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
504B:												
Coppler-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
504D:												
Coppler-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
504E:												
Coppler-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
505B:												
Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
Millersburg----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
505B:												
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
505C:												
Ossineke-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-6.5: Moist ---
Millersburg-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Horsehead-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
506B:												
Durkeelake-----	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist
506C:												
Durkeelake-----	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist ---	0.0-2.5: Dry 2.5-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist
507D:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
508B:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
508D:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
508E:												
Islandlake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Dry 2.0-6.5: Moist	0.0-3.0: Dry 3.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
Blue Lake-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist	0.0-1.0: Dry 1.0-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---
509A:												
Colonville-----	0.0-2.0: Moist 2.0-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 1.0-6.5: Wet ---	0.0-0.5: Moist 1.0-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-2.5: Moist 2.5-6.5: Wet ---	0.0-1.0: Dry 1.0-3.0: Moist 3.0-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---	0.0-1.5: Moist 1.5-6.5: Wet ---
Thunderbay-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---

Table 22.--Soil Moisture Status by Depth--Continued

Map symbol and soil name	January	February	March	April	May	June	July	August	September	October	November	December
510: Deerheart-----	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-0.5: Moist 0.5-6.5: Wet	0.0-1.5: Moist 1.5-6.5: Wet	0.0-2.0: Moist 2.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-6.5: Wet ---	0.0-6.5: Wet ---	0.0-6.5: Wet ---
511B: Parmalee-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.5: Wet Moist	0.0-1.5: Moist 1.5-3.5: Wet Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---
511C: Parmalee-----	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.0: Wet 3.0-6.5: Moist	0.0-1.5: Moist 1.5-3.5: Wet Moist	0.0-1.5: Moist 1.5-3.5: Wet Moist	0.0-6.5: Moist ---	0.0-0.5: Dry 0.5-6.5: Moist ---	0.0-1.0: Dry 1.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-2.0: Moist 2.0-3.5: Wet 3.5-6.5: Moist	0.0-6.5: Moist ---
512A: Algonquin-----	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-0.5: Moist 0.5-1.5: Wet 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist	0.0-1.0: Moist 1.0-1.5: Wet 1.5-6.5: Moist
Springport-----	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist	0.0-1.5: Wet 1.5-6.5: Moist
513A: Bowers-----	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-0.5: Moist 0.5-6.5: Wet	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-6.5: Moist ---	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet	0.0-1.0: Moist 1.0-6.5: Wet

Table 23.--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	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
13: Tawas-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
Lupton-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
14: Dawson-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
Loxley-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
15A: Croswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
16B: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
16C: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
16D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
17A: Crowswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
17B: Crowswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
18A: Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
19: Leafriver-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
20B: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
20D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
20F: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
21D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
23: Ausable-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
Bowstring-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
24A: Kinross-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	1.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
26B: Cublake-----	A	Jan-May	2.0	3.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	2.0	3.5	Perched	---	---	None	---	None
27A: Tacoda-----	C	Jan-Mar	1.0	3.5	Perched	---	---	None	---	None
		Apr-May	0.5	3.5	Perched	---	---	None	---	None
		Jun	1.0	3.5	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Dec	1.0	3.5	Perched	---	---	None	---	None
31B: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
31C: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
31D: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
32B: Kellogg-----	B	Jan-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	2.0	3.0	Perched	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
32C: Kellogg-----	B	Jan-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	2.0	3.0	Perched	---	---	None	---	None
36B: Annalake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-Jun	2.5	3.5	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.5	3.5	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
37A: Richter-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
41C: McGinn-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
44B: Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
44C: Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
47D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
47F: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
50B: Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
50B: Kinross-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	1.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
Croswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
51: Tawas-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
Leafriver-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
53B: Negwegon-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
53C: Negwegon-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
54A: Algonquin-----	D	Jan-Mar	1.0	1.5	Perched	---	---	None	---	None
		Apr-May	0.5	1.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	1.0	1.5	Perched	---	---	None	---	None
56B: Nester-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
56C: Nester-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
57B: Kawkawlin-----	C	Jan-Mar	1.0	1.5	Perched	---	---	None	---	None
		Apr-May	0.5	1.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	1.0	1.5	Perched	---	---	None	---	None
58A: Wakeley-----	D	Jan-May	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	2.0	Perched	---	---	None	---	None
		Jul-Aug	0.5	2.0	Perched	---	---	None	---	None
		Sep-Oct	0.0	2.0	Perched	---	---	None	---	None
		Nov-Dec	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
Allendale-----	C	Jan-Mar	1.0	3.0	Perched	---	---	None	---	None
		Apr-May	0.5	2.5	Perched	---	---	None	---	None
		Jun	2.0	3.0	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	2.0	3.0	Perched	---	---	None	---	None
		Oct	1.0	3.0	Perched	---	---	None	---	None
		Nov-Dec	0.5	3.0	Perched	---	---	None	---	None
67A: Bowers-----	C	Jan-Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	1.0	>6.5	Apparent	---	---	None	---	None
Deerheart-----	C	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	1.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
70: Lupton-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
71: Tawas-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep-Oct	0.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
75B: Rubicon-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
75D: Rubicon-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
78. Pits, borrow										
81B: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
81D: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
81E: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
81F: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
82B: Udorthents-----	---	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
83B: Udipsamments-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
86: Histosols-----	D	Jan-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
Aquents-----	D	Jan-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
87: Ausable-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	Long	Frequent
90B: Chinwhisker-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
93B: Tacoda-----	C	Jan-Mar	1.0	3.5	Perched	---	---	None	---	None
		Apr-May	0.5	3.5	Perched	---	---	None	---	None
		Jun	1.0	3.5	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Dec	1.0	3.5	Perched	---	---	None	---	None
Wakeley-----	D	Jan-May	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	2.0	Perched	---	---	None	---	None
		Jul-Aug	0.5	2.0	Perched	---	---	None	---	None
		Sep-Oct	0.0	2.0	Perched	---	---	None	---	None
		Nov-Dec	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
94F: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
McGinn-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
96D2: Mongo-----	D	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
98C: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
110D: Mongo-----	D	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
110F: Mongo-----	D	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
111B: Kellogg-----	A	Jan-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	2.0	3.0	Perched	---	---	None	---	None
111C: Kellogg-----	B	Jan-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	2.0	3.0	Perched	---	---	None	---	None
116B: Mancelona-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
116C: Mancelona-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
116D: Mancelona-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
116E: Mancelona-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
123D: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
125B: Melita-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
144B: Perecheney-----	B	Jan-May	2.5	>6.5	Apparent	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
144C: Perecheney-----	B	Jan-May	2.5	>6.5	Apparent	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
200. Borrow source										
210B: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
210C: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
210D: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
210E: Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
211B: Grayling, banded substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
211C: Grayling, banded substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
211D: Grayling, banded substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
211E: Grayling, banded substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
212B: Grayling, very deep water table-----	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
213B: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
213C: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
213D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
214B: Oxyaquic Udipsamments	A	Jan-May	3.5	>6.5	Apparent	---	---	None	---	None
		Jun	5.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	6.5	>6.5	Apparent	---	---	None	---	None
		Sep	5.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	3.5	>6.5	Apparent	---	---	None	---	None
215B: Typic Udipsamments, loamy substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
215C: Typic Udipsamments, loamy substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
215D: Typic Udipsamments, loamy substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
220B: Typic Udipsamments----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding		
			Upper limit Ft	Lower limit Ft	Kind	Surface water depth Ft	Duration	Frequency	Duration	Frequency
220C: Typic Udipsamments----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
220D: Typic Udipsamments----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
220E: Typic Udipsamments----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
221B: Typic Udipsamments, banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Lamellic Udipsamments	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
221C: Typic Udipsamments, banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Lamellic Udipsamments	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
221D: Typic Udipsamments, banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Lamellic Udipsamments	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
221E: Typic Udipsamments, banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Lamellic Udipsamments	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
222B: Typic Udipsamments, very deep water table	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
223B: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
223C: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
223D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
223E: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
224B: Croswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
225B: Entic Haplorthods, sandy, loamy substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
225C: Entic Haplorthods, sandy, loamy substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
225D: Entic Haplorthods, sandy, loamy substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
225E: Entic Haplorthods, sandy, loamy substratum-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
230C: Entic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
230D: Entic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
230E: Entic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
231B: Lamellic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
231C: Lamellic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
231D: Lamellic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
231E: Lamellic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
232B: Entic Haplorthods, sandy, very deep water table-----	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
Alfic Haplorthods, sandy, very deep water table-----	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
232D: Entic Haplorthods, sandy, very deep water table-----	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
Alfic Haplorthods, sandy, very deep water table-----	A	Jan-Dec	6.0	>6.5	Apparent	---	---	None	---	None
233B: Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Entic Haplorthods, sandy, fine-loamy banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
233C: Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Entic Haplorthods, sandy, fine-loamy banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
233D: Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
233D: Entic Haplorthods, sandy, fine-loamy banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
233E: Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Entic Haplorthods, sandy, fine-loamy banded substratum----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
234B: Lamellic Oxyaquic Haplorthods, sandy---	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
235B: Alfic Haplorthods, sandy over loamy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
235C: Alfic Haplorthods, sandy over loamy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
235D: Alfic Haplorthods, sandy over loamy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
235E: Alfic Haplorthods, sandy over loamy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Alfic Haplorthods, sandy-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
236B: Arenic Hapludalfs-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
236C: Arenic Hapludalfs-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
236D: Arenic Hapludalfs-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
236E: Arenic Hapludalfs-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
237B: Glossudalfs, loamy----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
237C: Glossudalfs, loamy----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
237D: Glossudalfs, loamy----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
237E: Glossudalfs, loamy----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
247B: Glennie-----	B	Jan-May	3.0	3.5	Perched	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	3.0	3.5	Perched	---	---	None	---	None
Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
247C: Glennie-----	B	Jan-May	3.0	3.5	Perched	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	3.0	3.5	Perched	---	---	None	---	None
Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
250D: Glossudalfs-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Haplosaprists, euic---	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
252A: Haplosaprists, euic---	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
252A: Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
254A: Haplosaprists, euic---	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
Fluvaquents-----	---	Jan-Apr	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
		May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	---
		Jun-Sep	1.0	>6.5	Apparent	---	---	---	---	---
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
Aquic Udipsamments---	A	Jan-Mar	1.0	>6.5	Apparent	---	---	None	---	---
		Apr-May	0.5	>6.5	Apparent	---	---	None	Brief	Occasional
		Jun	2.0	>6.5	Apparent	---	---	None	---	---
		Jul-Aug	2.5	>6.5	Apparent	---	---	None	---	---
		Sep	2.0	>6.5	Apparent	---	---	None	---	---
		Oct	0.5	>6.5	Apparent	---	---	None	Brief	Occasional
		Nov-Dec	1.0	>6.5	Apparent	---	---	None	---	---
262A: Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
264A: Allendale-----	C	Jan-Mar	1.0	3.0	Perched	---	---	None	---	None
		Apr-May	0.5	2.5	Perched	---	---	None	---	None
		Jun	2.0	3.0	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	2.0	3.0	Perched	---	---	None	---	None
		Oct	1.0	3.0	Perched	---	---	None	---	None
		Nov-Dec	0.5	3.0	Perched	---	---	None	---	None
265B: Glossudalfs-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Allendale-----	C	Jan-Mar	1.0	3.0	Perched	---	---	None	---	None
		Apr-May	0.5	2.5	Perched	---	---	None	---	None
		Jun	2.0	3.0	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	2.0	3.0	Perched	---	---	None	---	None
		Oct	1.0	3.0	Perched	---	---	None	---	None
		Nov-Dec	0.5	3.0	Perched	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
272:										
Endoaquods-----	---	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct	0.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
Fluvaquents, occasionally flooded	---	Jan-Apr	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
		May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	1.0	>6.5	Apparent	---	---	---	---	None
		Oct	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Nov-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
273:										
Leafriver-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
Wakeley-----	D	Jan-May	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	2.0	Perched	---	---	None	---	None
		Jul-Aug	0.5	2.0	Perched	---	---	None	---	None
		Sep-Oct	0.0	2.0	Perched	---	---	None	---	None
		Nov-Dec	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
274:										
Typic Endoaquods, wet	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul	0.5	>6.5	Apparent	---	---	None	---	None
		Aug	1.0	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
280:										
Aquents-----	D	Jan-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
Histosols-----	D	Jan-Dec	0.0	>6.5	Apparent	0.0-1.0	Very long	Frequent	---	None
281:										
Haplosaprists, dysic--	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Sep	1.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
282:										
Haplosaprists, euic---	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	0.5	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
307B:										
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
307E:										
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
338B:										
Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
338E: Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
352B: Deford-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None
Croswell-----	A	Jan-Feb	4.5	>6.5	Apparent	---	---	None	---	None
		Mar	2.5	>6.5	Apparent	---	---	None	---	None
		Apr-May	2.0	>6.5	Apparent	---	---	None	---	None
		Jun	3.5	>6.5	Apparent	---	---	None	---	None
		Jul	4.0	>6.5	Apparent	---	---	None	---	None
		Aug-Sep	4.5	>6.5	Apparent	---	---	None	---	None
		Oct	3.0	>6.5	Apparent	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
360: Wakeley-----	D	Jan-May	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
		Jun	0.0	2.0	Perched	---	---	None	---	None
		Jul-Aug	0.5	2.0	Perched	---	---	None	---	None
		Sep-Oct	0.0	2.0	Perched	---	---	None	---	None
		Nov-Dec	0.0	2.0	Perched	0.0-1.0	Long	Frequent	---	None
362B: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
362D: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
362E: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
368A: Au Gres-----	B	Jan-Feb	1.5	>6.5	Apparent	---	---	None	---	None
		Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul	2.0	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep	2.0	>6.5	Apparent	---	---	None	---	None
		Oct-Nov	1.0	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit Ft	Lower limit Ft	Kind	Surface water depth Ft	Duration	Frequency	Duration	Frequency
368A: Deford-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
369: Deford-----	A/D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	0.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
371: Springport-----	D	Jan-May	0.0	1.5	Perched	0.0-1.0	Long	Frequent	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	0.0	1.5	Perched	---	---	None	---	None
		Oct-Dec	0.0	1.5	Perched	0.0-1.0	Long	Frequent	---	None
380. Access denied										
384B: Iosco-----	B	Jan-Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun	1.0	>6.5	Apparent	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Dec	1.0	>6.5	Apparent	---	---	None	---	None
388B: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
388D: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
388E: Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
390B: Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
390D: Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
390E: Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
390F: Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
391B: Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
393B: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
393C: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
399D: Menominee-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Bamfield, sandy substratum-----	C	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
400F: Menominee-----	A	Jan-Dec	>6.5	>6.5	---	---	---	---	---	None
Bamfield, sandy substratum-----	C	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
424B: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Ossineke, sandy substratum-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding		Flooding		
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
424B: Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	---	---	None
424C: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Ossineke, sandy substratum-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
426B: Coppler-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
441B: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Nester-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
441C: Morganlake-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Nester-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar-May	2.0	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
452D: Bamfield, sandy substratum-----	C	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
475B: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
475D: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
475E: Graycalm-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
476B: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Perechney-----	B	Jan-May	2.5	>6.5	Apparent	---	---	---	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	---	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	---	---	None
476D: Klacking-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Perechney-----	B	Jan-May	2.5	>6.5	Apparent	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	2.5	>6.5	Apparent	---	---	None	---	None
488A: Allendale-----	C	Jan-Mar	1.0	3.0	Perched	---	---	None	---	None
		Apr-May	0.5	2.5	Perched	---	---	None	---	None
		Jun	2.0	3.0	Perched	---	---	None	---	None
		Jul-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	2.0	3.0	Perched	---	---	None	---	None
		Oct	1.0	3.0	Perched	---	---	None	---	None
		Nov-Dec	0.5	3.0	Perched	---	---	None	---	None
496B: Gerrish-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Grayling-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
503D: Bamfield, sandy substratum-----	C	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
503E: Bamfield, sandy substratum-----	C	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
504B: Coppler-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
504D: Coppler-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
504E: Copples-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
505B: Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
505C: Ossineke-----	B	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.0	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.0	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
Millersburg-----	B	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Horsehead-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
506B: Durkeelake-----	B	Jan-May	2.0	3.5	Perched	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	2.0	3.5	Perched	---	---	None	---	None
506C: Durkeelake-----	B	Jan-May	2.0	3.5	Perched	---	---	None	---	None
		Jun-Oct	>6.5	>6.5	---	---	---	None	---	None
		Nov-Dec	2.0	3.5	Perched	---	---	None	---	None
507D: Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
508B: Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
508D: Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
508E: Islandlake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None
Blue Lake-----	A	Jan-Dec	>6.5	>6.5	---	---	---	None	---	None

Table 23.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Months	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft		Ft				
509A: Colonville-----	C	Jan	2.0	>6.5	Apparent	---	---	None	Brief	Occasional
		Feb	1.5	>6.5	Apparent	---	---	None	Brief	Occasional
		Mar-May	1.0	>6.5	Apparent	---	---	None	Brief	Occasional
		Jun-Jul	2.5	>6.5	Apparent	---	---	None	---	None
		Aug	3.0	>6.5	Apparent	---	---	None	---	None
		Sep-Nov	1.5	>6.5	Apparent	---	---	None	---	None
		Dec	1.5	>6.5	Apparent	---	---	None	Brief	Occasional
Thunderbay-----	D	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
		Jun-Aug	1.0	>6.5	Apparent	---	---	None	---	None
		Sep-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	Brief	Occasional
510: Deerheart-----	C	Jan-May	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun	0.5	>6.5	Apparent	---	---	None	---	None
		Jul	1.5	>6.5	Apparent	---	---	None	---	None
		Aug	2.0	>6.5	Apparent	---	---	None	---	None
		Sep	1.0	>6.5	Apparent	---	---	None	---	None
		Oct-Dec	0.0	>6.5	Apparent	0.0-1.0	Long	Frequent	---	None
511B: Parmalee-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.5	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
511C: Parmalee-----	C	Jan-Feb	>6.5	>6.5	---	---	---	None	---	None
		Mar	2.0	3.0	Perched	---	---	None	---	None
		Apr-May	1.5	3.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Nov	2.0	3.5	Perched	---	---	None	---	None
		Dec	>6.5	>6.5	---	---	---	None	---	None
512A: Algonquin-----	D	Jan-Mar	1.0	1.5	Perched	---	---	None	---	None
		Apr-May	0.5	1.5	Perched	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	1.0	1.5	Perched	---	---	None	---	None
Springport-----	D	Jan-May	0.0	1.5	Perched	0.0-1.0	Long	Frequent	---	None
		Jun-Aug	>6.5	>6.5	---	---	---	None	---	None
		Sep	0.0	1.5	Perched	---	---	None	---	None
		Oct-Dec	0.0	1.5	Perched	0.0-1.0	Long	Frequent	---	None
513A: Bowers-----	C	Jan-Mar	1.0	>6.5	Apparent	---	---	None	---	None
		Apr-May	0.5	>6.5	Apparent	---	---	None	---	None
		Jun-Sep	>6.5	>6.5	---	---	---	None	---	None
		Oct-Dec	1.0	>6.5	Apparent	---	---	None	---	None

Table 24.--Classification of the Soils

Soil name	Family or higher taxonomic class
Alfic Haplorthods, sandy	Sandy, mixed, frigid Alfic Haplorthods
Alfic Haplorthods, sandy over loamy-----	Sandy over loamy, mixed, frigid Alfic Haplorthods
Algonquin-----	Fine, mixed, semiactive, frigid Aquic Hapludalfs
Allendale-----	Sandy over clayey, mixed, semiactive, frigid Alfic Epiaquods
Annalake-----	Coarse-loamy, mixed, superactive, frigid Alfic Oxyaquic Haplorthods
Aquents-----	Aquents
Aquic Udipsamments-----	Mixed, frigid Aquic Udipsamments
Arenic Hapludalfs-----	Mixed, frigid Arenic Hapludalfs
Au Gres-----	Sandy, mixed, frigid Typic Endoaquods
Ausable-----	Sandy, mixed, frigid Histic Humaquepts
Bamfield-----	Fine-loamy, mixed, active, frigid Haplic Glossudalfs
Blue Lake-----	Sandy, mixed, frigid Lamellic Haplorthods
Bowers-----	Fine, mixed, semiactive, frigid Aquic Glossudalfs
Bowstring-----	Euic, frigid Fluvaquentic Haplosaprists
Chinwhisker-----	Sandy, mixed, frigid Lamellic Haplorthods
Colonville-----	Coarse-loamy, mixed, active, calcareous, frigid Fluvaquentic Endoaquolls
Coppler-----	Loamy-skeletal, mixed, semiactive, frigid Arenic Hapludalfs
Croswell-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Cublake-----	Sandy, mixed, frigid Oxyaquic Haplorthods
Dawson-----	Sandy or sandy-skeletal, mixed, dysic Terric Haplosaprists
Deerheart-----	Fine-loamy, mixed, semiactive, nonacid, frigid Aeric Endoaquepts
Deford-----	Mixed, frigid Typic Psammaquents
Durkeelake-----	Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs
Endoaquods-----	Mixed, frigid Endoaquods
Entic Haplorthods, sandy	Sandy, mixed, frigid Entic Haplorthods
Fluvaquents-----	Mixed, frigid Fluvaquents
Gerrish-----	Mixed, frigid Lamellic Udipsamments
Glennie-----	Coarse-loamy, mixed, semiactive, frigid Oxyaquic Fraglossudalfs
Glossudalfs, loamy-----	Mixed, frigid Glossudalfs
Graycalm-----	Mixed, frigid Lamellic Udipsamments
Grayling-----	Mixed, frigid Typic Udipsamments
Haplosaprists, dysic-----	Dysic, frigid Haplosaprists
Haplosaprists, euic-----	Euic, frigid Haplosaprists
Histosols-----	Histosols
Horsehead-----	Sandy-skeletal, mixed, frigid Arenic Hapludalfs
Iosco-----	Sandy over loamy, mixed, active, frigid Argic Endoaquods
Islandlake-----	Sandy, mixed, frigid Lamellic Haplorthods
Kawkawlin-----	Fine, mixed, semiactive, frigid Aquic Glossudalfs
Kellogg-----	Sandy over clayey, mixed, active, frigid Alfic Oxyaquic Haplorthods
Kinross-----	Sandy, mixed, frigid Typic Endoaquods
Klacking-----	Loamy, mixed, semiactive, frigid Arenic Glossudalfs
Lamellic Haplorthods, sandy-----	Sandy, mixed, frigid Lamellic Haplorthods
Lamellic Oxyaquic Haplorthods, sandy-----	Sandy, mixed, frigid Lamellic Oxyaquic Haplorthods
Lamellic Udipsamments-----	Mixed, frigid Lamellic Udipsamments
Leafriver-----	Sandy, mixed, frigid Histic Humaquepts
Loxley-----	Dysic, frigid Typic Haplosaprists
Lupton-----	Euic, frigid Typic Haplosaprists
Mancelona-----	Sandy, mixed, frigid Alfic Haplorthods
McGinn-----	Coarse-loamy, mixed, semiactive, frigid Haplic Glossudalfs
Melita-----	Sandy, mixed, frigid Alfic Haplorthods
Menominee-----	Sandy over loamy, mixed, active, frigid Alfic Haplorthods
Millersburg-----	Coarse-loamy, mixed, active, frigid Haplic Glossudalfs
Mongo-----	Fine, mixed, semiactive, frigid Haplic Glossudalfs
Morganlake-----	Sandy over loamy, mixed, active, frigid Alfic Oxyaquic Haplorthods
Negwegon-----	Fine, mixed, semiactive, frigid Oxyaquic Glossudalfs
Nester-----	Fine, mixed, semiactive, frigid Oxyaquic Glossudalfs
Ossineke-----	Fine-loamy, mixed, semiactive, frigid Oxyaquic Glossudalfs
Oxyaquic Udipsamments-----	Mixed, frigid Oxyaquic Udipsamments
Parmalee-----	Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs
Perecheney-----	Fine-loamy, mixed, active, frigid Oxyaquic Glossudalfs
Richter-----	Coarse-loamy, mixed, semiactive, frigid Argic Endoaquods

Table 24.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Rubicon-----	Sandy, mixed, frigid Entic Haplorthods
Springport-----	Fine, mixed, semiactive, frigid Typic Epiquolls
Tacoda-----	Sandy, mixed, frigid Typic Epiquods
Tawas-----	Sandy or sandy-skeletal, mixed, euc, frigid Terric Haplosaprists
Thunderbay-----	Coarse-loamy, mixed, semiactive, frigid Fluvaquentic Endoaquolls
Typic Endoaquods, wet----	Frigid Typic Endoaquods
Typic Udipsamments-----	Mixed, frigid Typic Udipsamments
Udipsamments-----	Udipsamments
Udorthents-----	Udorthents
Wakeley-----	Sandy over clayey, mixed, semiactive, nonacid, frigid Aeric Epiquents

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