United States Department of Agriculture

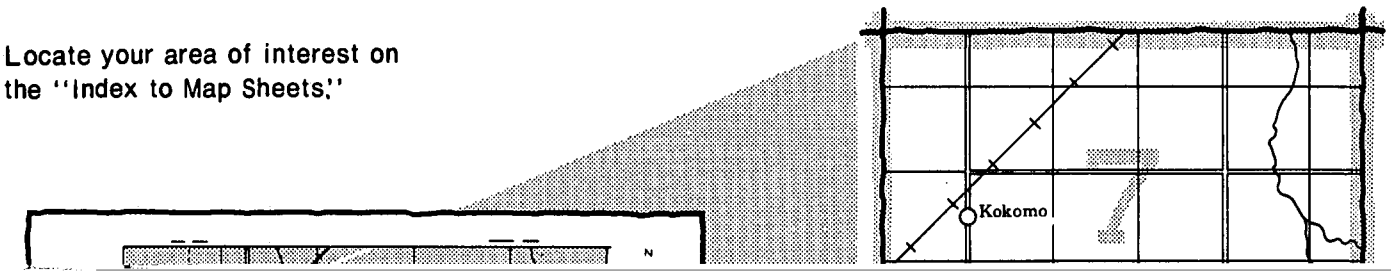
Soil Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Knox County, Illinois

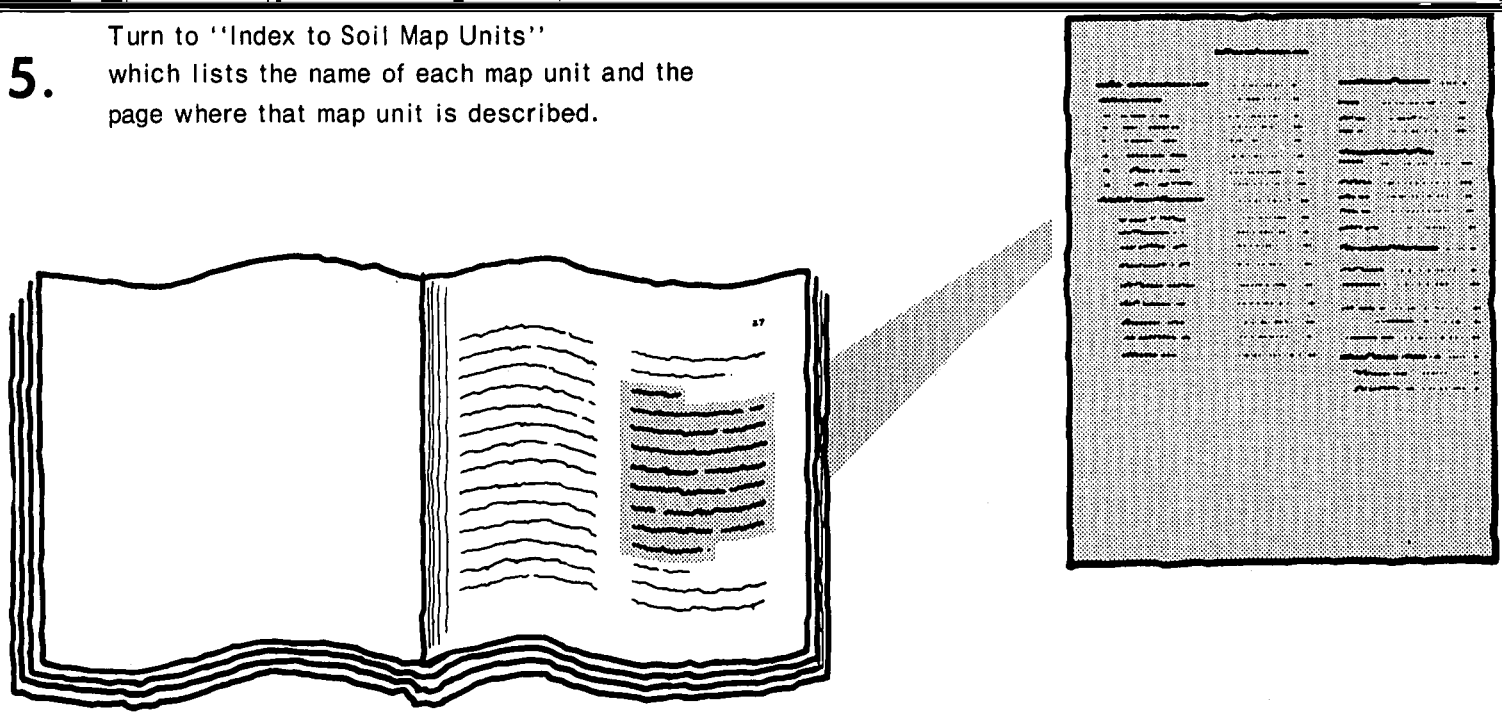
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets."

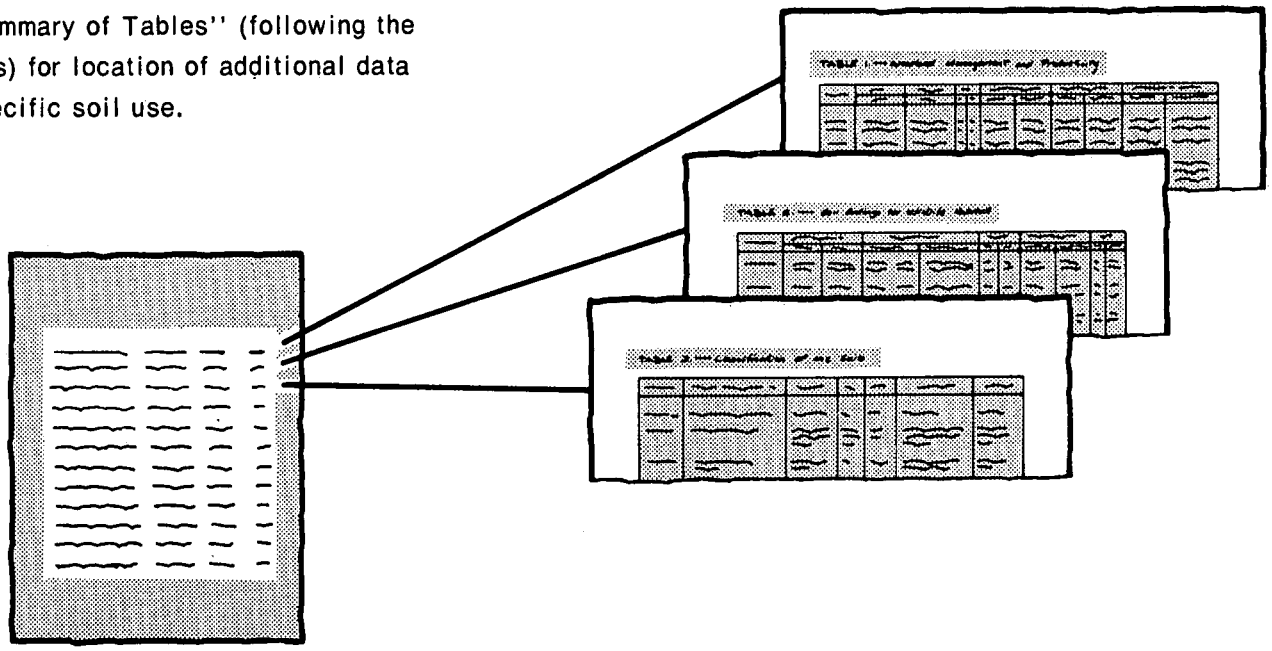


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



Consult "Contents" for parts of the publication that will meet your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

[redacted]

descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Knox County Soil and Water Conservation District. The cost was shared by the Knox County Board.

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.

This soil survey is Illinois Agricultural Experiment Station Soils Report No. 121.

Cover: A protective cover of crop residue on a Fayette soil.

Contents

Index to Map Units

Summary of Tables

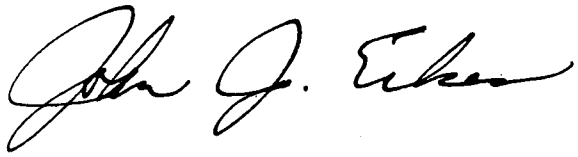
Foreword

This soil survey contains information that can be used in land-planning programs in Knox County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

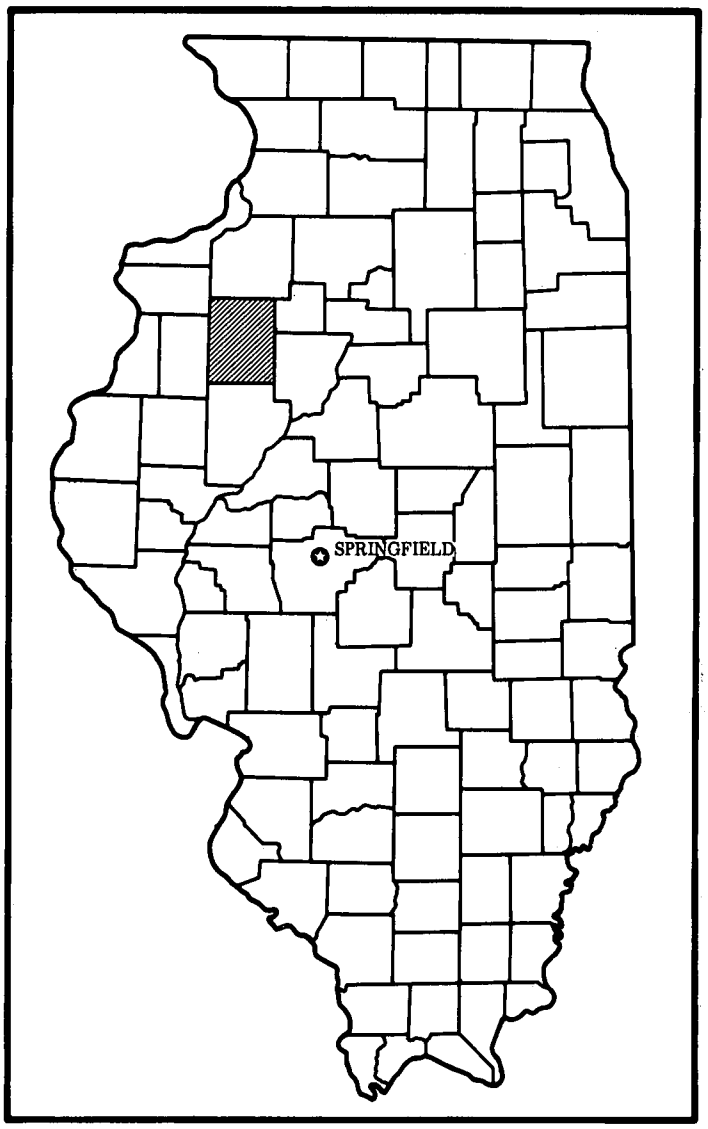
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey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

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

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



John J. Eckes
State Conservationist
Soil Conservation Service



Location of Knox County in Illinois.

Soil Survey of Knox County, Illinois

By Roger D. Windhorn, Soil Conservation Service

Fieldwork by Roger D. Windhorn, Garv W. Goodrich, Mike E. Lilly, and

Charles L. Love, Soil Conservation Service, and
Mark W. Bramstedt, Bruce J. Houghtby, Mike F. Kuhn, and Mark Matusiak,
Knox County

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
Illinois Agricultural Experiment Station

KNOX COUNTY is in the northwestern part of Illinois. It has a total area of 466,560 acres, or about 729 square miles. According to the 1980 census, it has a population of 61,344. Galesburg, the county seat, has a population of 35,421.

This soil survey updates the surveys of Knox County published in 1904, 1913, and 1977 (*3, 4, 6*). It provides more information and larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information about Knox County. It briefly describes settlement and development, farming, physiography and drainage, and climate.

Settlement and Development

Several Indian tribes had inhabited the survey area prior to the establishment of the first non-Indian settlements (*14*). The Potawatomi Indians were the latest inhabitants. They established several villages near a ford of the Spoon River, at the site of the present-day town of Maquon.

In 1816, U.S. Government surveyors charted the rectangular grid system of land division into 160-acre parcels. These parcels were used to reward veterans of

The early settlers preferred to locate near the forested areas because of the availability of wood, fear of prairie fires and wind, and the belief that the prairies were infertile. After the Black Hawk War, more settlers began to arrive since the fear of Indian attacks was diminished.

Knoxville (originally named Henderson) was established in 1831. It was the first town and county seat platted in the county. In 1837, George Washington Gale founded Galesburg, which was made the county seat during the same year. After it became the site for the conjunction of railroad lines, this town began to flourish as a major marketing center. Other towns were established as water stops along the rail lines or as market centers. Galesburg currently has numerous factories that manufacture a wide variety of products. The railroads also provide employment for many persons.

Much of Knox County is underlain by bituminous coal. About 21,164 acres has been disturbed by surface mining. Mining began around 1920.

Transportation systems are well developed. The county has eight state highways, two U.S. highways, one interstate highway, two railroad lines, one municipal airport, and numerous county roads.

Farming

In 1978, the county had 1,346 farms, which made up about 414,044 acres, or nearly 89 percent of the total land area (*12*). The total acreage of cropland was 329,983 acres. Of this total, 266,815 acres was planted to corn and soybeans and 8,081 acres was planted to small grain. About 20,133 acres was used for hay.

In 1978, the county had 56,672 head of cattle, of which a total of 43,994 was sold (*12*). The number of

about 580 acres in size. Lake Storey and Lake Bracken are the other major lakes. The rest of the impounded water is in areas that formerly were surface mined.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Knox County is cold in winter and quite hot in summer

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug

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 interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions,

management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so

observations to identify all of the kinds of soil on the landscape.

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

Map Unit Descriptions

This section describes the map units in the survey area at two levels of detail. The general soil map units, called soil associations, are described first and then the detailed map units. Most of the general soil map units represent the soils of major extent in the survey area. The detailed map units represent all of the named soils in the survey area.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

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

Because of its small scale, the map is not suitable for planning the management of a farm or field or for

Ipava soils are on the higher parts of the landscape. They are somewhat poorly drained. Typically, the surface layer is black, friable silt loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable silty clay loam about 8 inches thick. The subsoil is about 32 inches thick. It is mottled and friable. The upper part is brown silty clay loam, the next part is dark grayish brown silty clay, and the lower part is grayish brown silty clay loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam.

Sable soils are on the broad flats. They are poorly drained. Typically, the surface layer is black, friable silty clay loam about 6 inches thick. The subsurface layer is black and very dark gray, friable silty clay loam about 15 inches thick. The subsoil is dark grayish brown and gray, mottled, friable and firm silty clay loam about 23 inches thick. The underlying material to a depth of 60 inches is light gray, mottled, calcareous, friable silt loam.

Minor in this association are the slowly permeable Denny and Edinburg soils in shallow depressions and the moderately well drained Tama soils along drainageways and on convex ridgetops.

This association is used mainly for cultivated crops or pasture. In the Galesburg area, however, the soils also

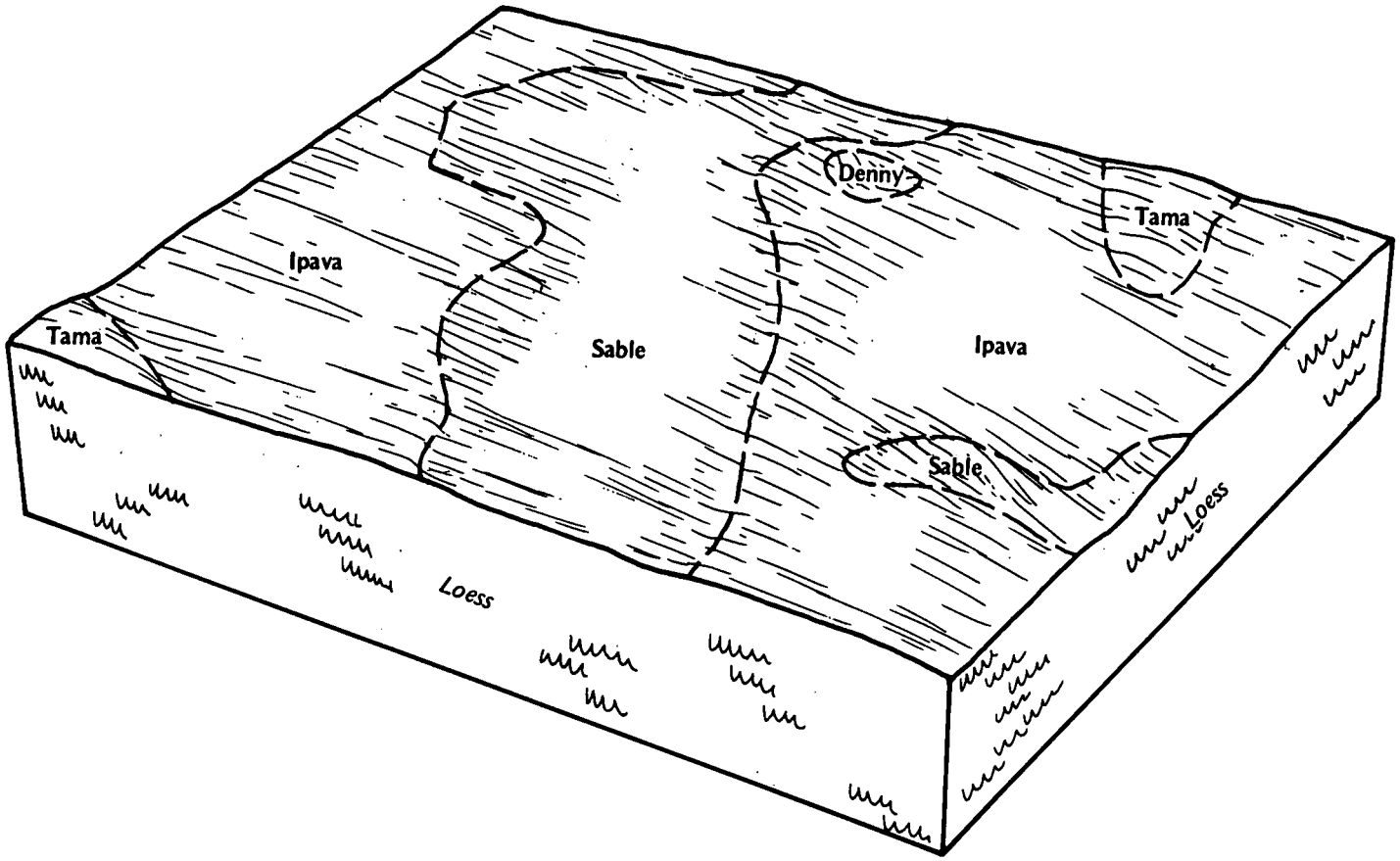


Figure 1.—Typical pattern of soils and parent material in the Ipava-Sable association.

many small, meandering streams. Slopes are generally long and smooth; however, they are more irregular along

The upper part is brown silty clay loam, the next part is dark grayish brown silty clay, and the lower part is

pasture, and hay. The more sloping soils are moderately suited to cultivated crops. Erosion is the major hazard.

The nearly level soils in this association are poorly suited to dwellings and septic tank absorption fields. The gently sloping to strongly sloping soils are moderately suited. The seasonal high water table, moderately slow

Rozetta soils are gently sloping and sloping. They are in the higher areas between drainageways or are on the upper parts of side slopes along the drainageways. They are moderately well drained. Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsoil is silty clay loam about 44 inches thick.


Clarksdale

subsurface layer is dark grayish brown, friable loam about 5 inches thick. The subsoil is about 38 inches thick. The upper part is brown, friable loam; the next part is dark yellowish brown, mottled, firm clay loam; and the lower part is yellowish brown, mottled, friable clay loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, calcareous, friable loam.

Marseilles soils are steep and very steep and are on the lower side slopes. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsoil is silty clay loam about 28 inches thick. The upper part is yellowish brown and friable, the next part is yellowish brown and firm, and the lower part is olive, mottled, and very firm. Olive and light brownish gray,

side slopes near the major streams. The somewhat poorly drained Atlas soils are on side slopes above the Hickory soils. The moderately well drained Elco soils on side slopes above the Hickory and Marseilles soils. The somewhat poorly drained Lawson and Orion soils in drainageways. The moderately well drained Rozetta soils are on narrow ridgetops.

Most areas are used for woodland or for woodland wildlife habitat. Some of the less sloping areas are pastured. This association is moderately suited to pasture and woodland. Erosion is the major hazard in the pastured areas. Erosion and the slope are the major concerns in managing woodland. Woodland wildlife is abundant in areas where habitat is available.

5. Lawson-Sawmill-Huntsville Association

Nearly level, somewhat poorly drained, poorly drained, and well drained soils formed in alluvium on bottom land

This association consists of nearly level soils on bottom land along the Spoon River and the other major streams. These soils are frequently or occasionally flooded for brief periods. Slopes range from 0 to 2 percent.

This association makes up 7 percent of the county. It is about 45 percent Lawson soils, 20 percent Sawmill and similar soils, 15 percent Huntsville soils, and 20 percent minor soils (fig. 5).

Lawson soils are somewhat poorly drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 12 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 19 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown, brown, and very dark grayish brown, mottled, friable silt loam. It contains iron concretions.

Sawmill soils are poorly drained. Typically, the surface layer is very dark gray, firm silty clay loam about 13 inches thick. The subsurface layer is very dark gray and black, firm silty clay loam about 25 inches thick. It is mottled in the lower part. The subsoil is dark gray, mottled, firm and friable silty clay loam about 16 inches thick. The underlying material to a depth of 60 inches is gray, mottled, friable silty clay loam.

Huntsville soils are well drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is friable silt loam about 42 inches thick. The upper part is very dark grayish brown, the next part is dark brown, and the lower part is brown. The underlying material to a depth of 60 inches is dark brown, friable silt loam.

Minor in this association are the Alvin, Camden, Dorchester, Downs, Harvard, Littleton, and Orion soils. The well drained Alvin and Harvard, moderately well drained Camden and Downs, and somewhat poorly drained Littleton soils are on terraces. The well drained, calcareous Dorchester and somewhat poorly drained Orion soils are on bottom land. Their surface layer is lighter colored than that of the major soils.

This association is used mainly for cultivated crops or for pasture and hay. It is generally well suited to these uses. The flooding delays harvesting of hay and row crops in some years. These soils are generally unsuited to dwellings and septic tank absorption fields because of

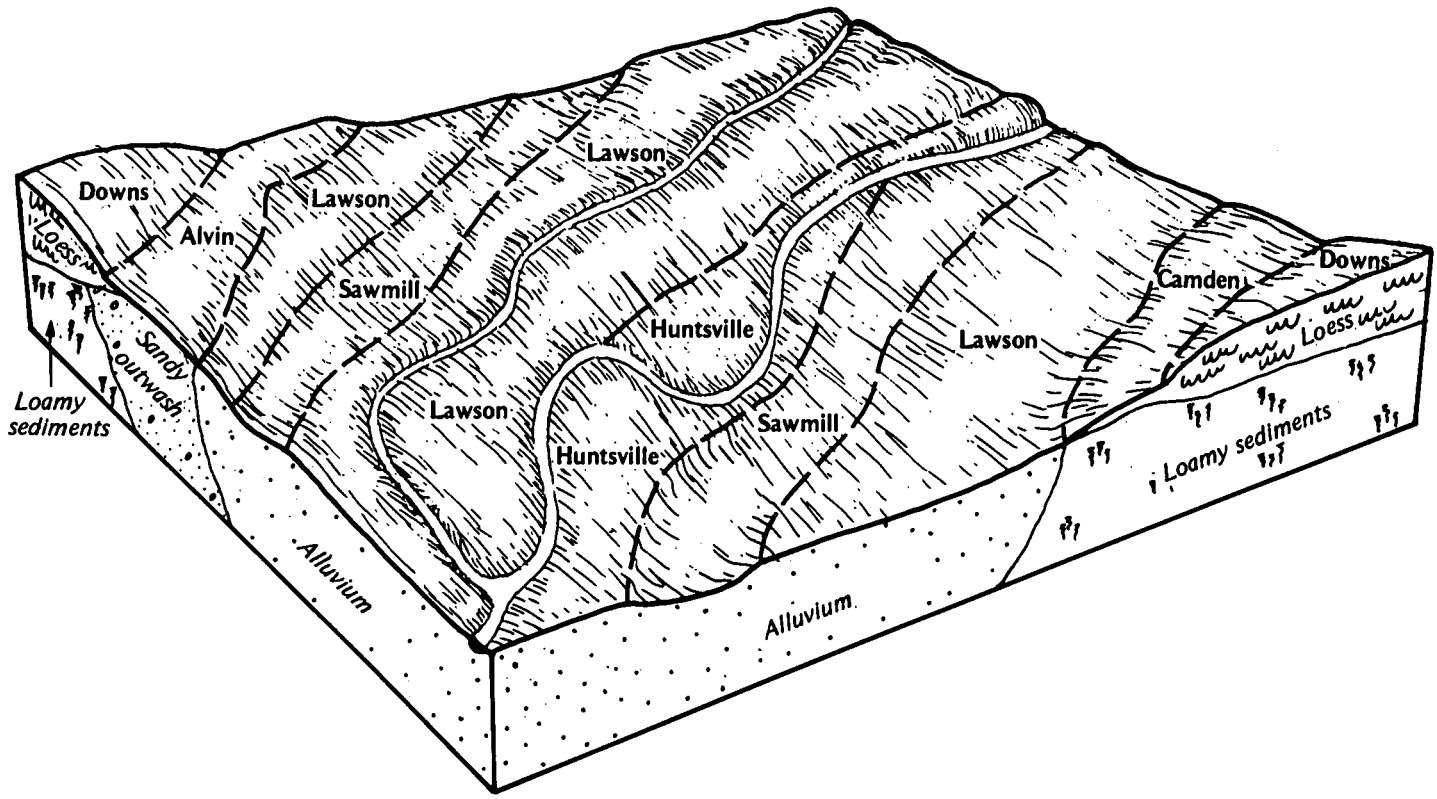
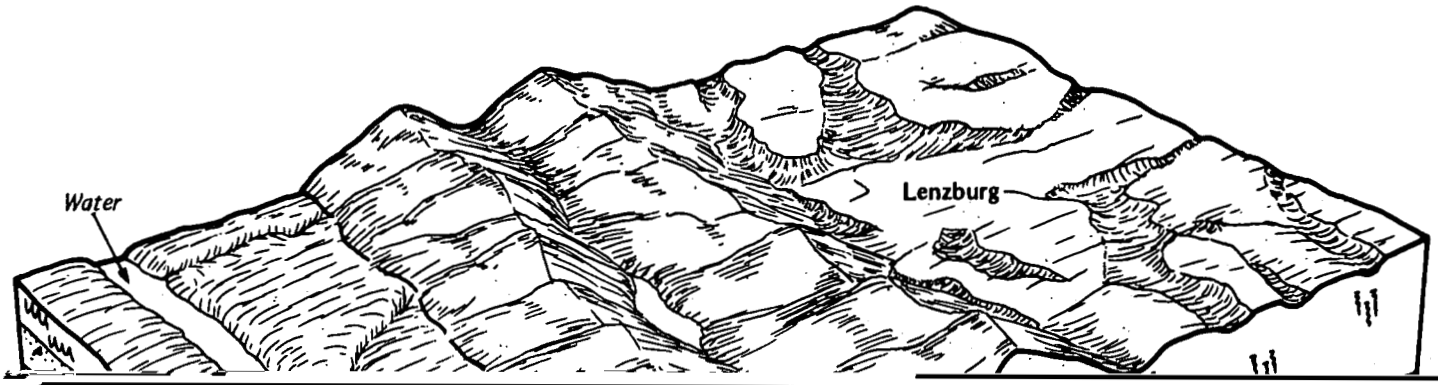


Figure 5.—Typical pattern of soils and parent material in the Lawson-Sawmill-Huntsville association.


Water
Lenzburg

soils are along drainageways in areas that were not mined. Also of minor extent are many soils that formed

association vary, depending on the degree of reclamation. Erosion is the major hazard. The material

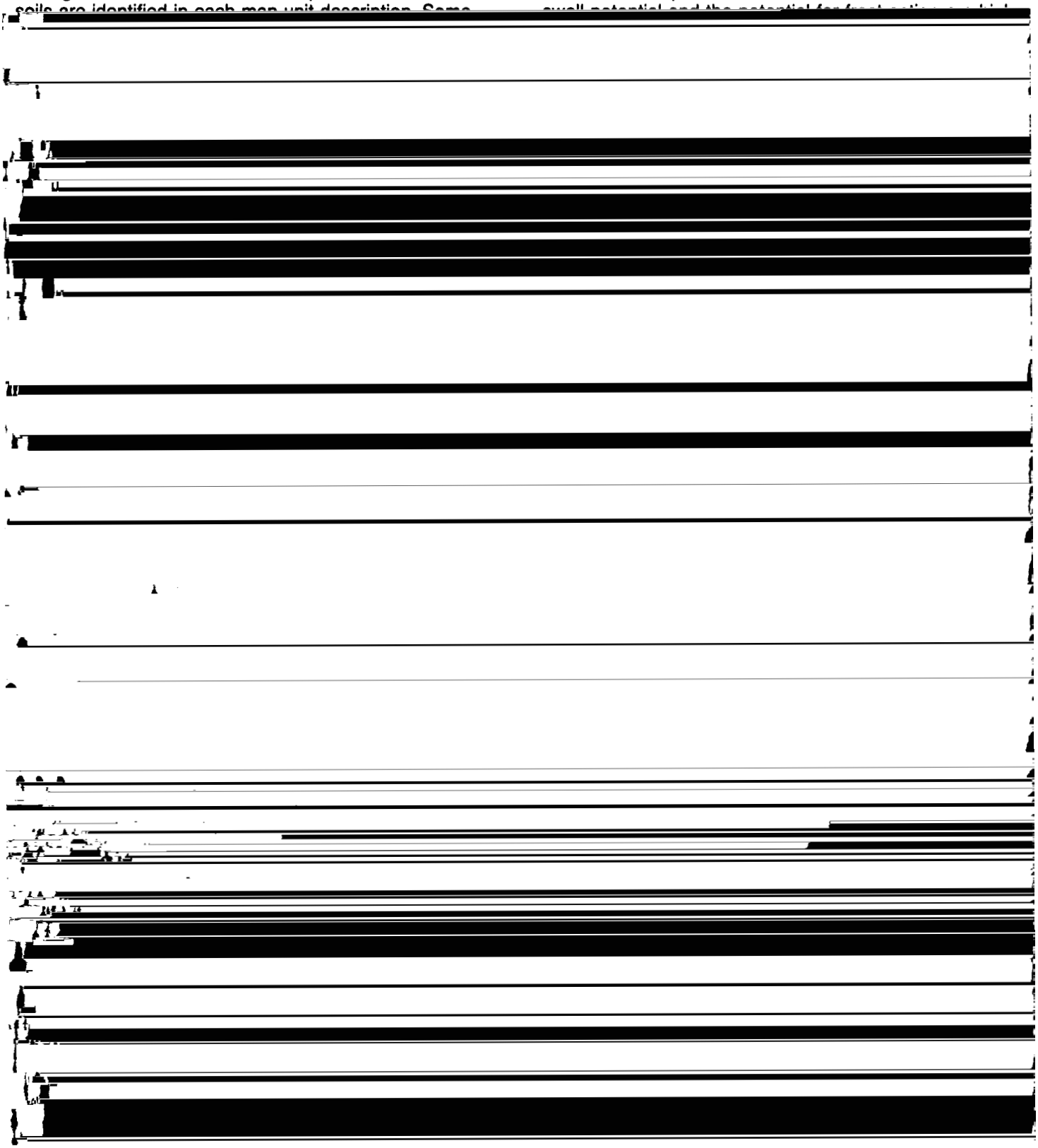
Figure 7.—An area of Rozetta soils used for picnicking.

a series have major horizons that are similar in

Some map units are made up of two or more major

differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some

layer, and the plow layer is mostly subsoil material, which tends to puddle and crust after rains. The shrink-



upland side slopes and foot slopes. Individual areas are

soil, and damage to tree roots. Measures that protect

Most areas are cultivated. This soil is well suited to cultivated crops and to pasture and hay. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Subsurface tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and productivity.

Adapted forage and hay plants grow well on this soil. Subsurface tile drains can reduce the wetness if suitable outlets are available. Overgrazing or grazing when the

medium acid. Erosion has removed all of the original surface layer, and the plow layer is mostly subsoil material, which puddles and crusts easily after rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is poorly suited to cultivated crops and moderately suited to pasture and hay. It is well suited to woodland, to openland and woodland wildlife habitat, to dwellings, and to septic tank absorption fields.

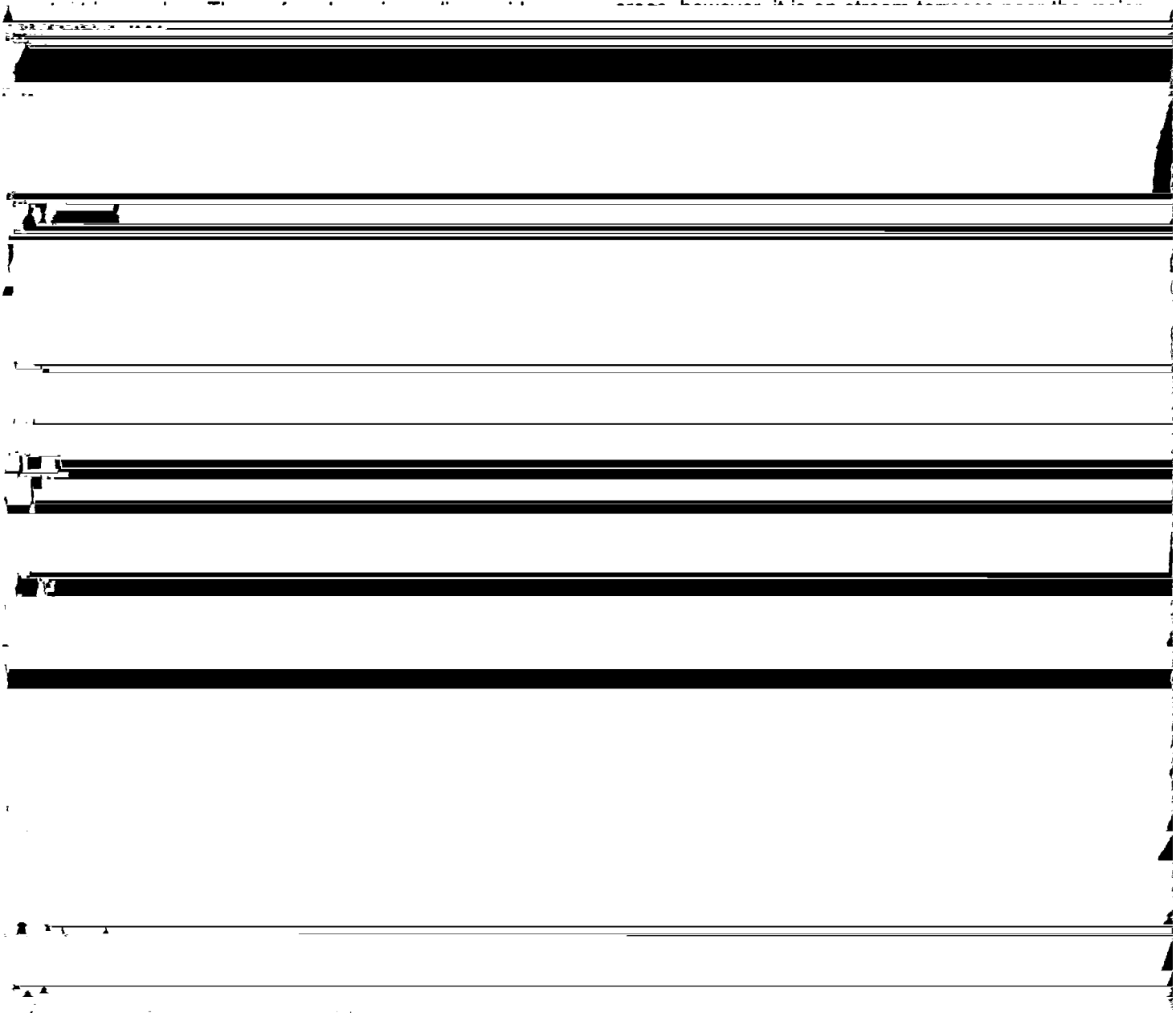
If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. Poor tilth is a limitation. A

a very firm subsoil. They are on side slopes below the Sylvan soil. They make up 5 to 10 percent of the unit.

Air and water move through the Sylvan soil at a moderate rate. Surface runoff is rapid in cultivated areas. Available water capacity is very high. Organic matter

The land capability classification is IVe.

36B—Tama silt loam, 1 to 4 percent slopes. This gently sloping, moderately well drained soil is predominantly on convex upland ridgetops. In a few



unless it is limed. The subsoil also is medium acid. Erosion has removed all of the original surface layer, and the plow layer is mostly subsoil material, which puddles and crusts easily after rains. The shrink-swell potential is moderate, and the potential for frost action is high.

drainageways. Individual areas are irregular in shape and range from 5 to more than 1,000 acres in size.

Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is very dark gray, friable silt loam about 4 inches thick. The subsoil is

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

The land capability classification is IIe.

36B2—Tama silty clay loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is along upland drainageways. Individual areas are irregular in shape and range from 5 to 125 acres in size.

Typically, the surface layer is very dark grayish brown, friable silty clay loam about 6 inches thick. The subsoil is silty clay loam about 38 inches thick. The upper part is brown and friable; the next part is dark yellowish brown

below the subsoil, and reinforcing the foundations help to prevent the structural damage caused by wetness and by shrinking and swelling.

The seasonal high water table is a limitation if this soil

Subsurface tile drains lower the water table.

The land capability classification is IIe.

36C2—Tama silty clay loam, 5 to 10 percent slopes, eroded. This sloping, moderately well drained soil is on upland ridgetops and side slopes. Individual areas are irregular in shape and range from 3 to 200 acres in size.

should not be grazed or clipped until they are sufficiently established.

If this soil is used as a site for dwellings with basements, the seasonal high water table and the shrink-swell potential are limitations. Extending the footings below the subsoil and reinforcing the foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface tile drains near the foundations lowers the water table.

The seasonal high water table is a limitation if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table.

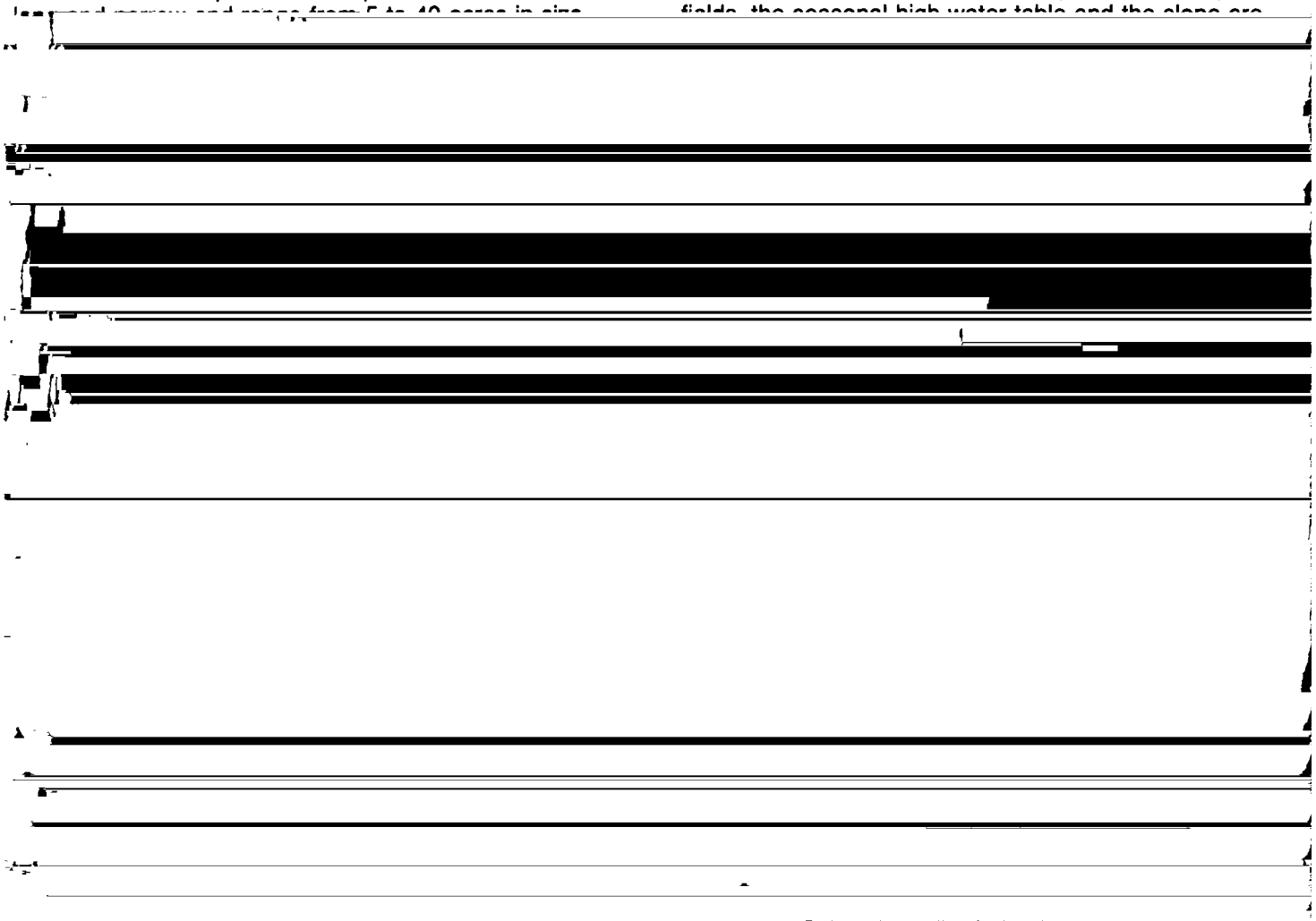
The land capability classification is IIIe.

36D2—Tama silty clay loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on upland side slopes. Individual areas are [illegible] and narrow and range from 5 to 40 acres in size.

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus also helps to prevent surface compaction, excessive runoff, and a greater susceptibility to erosion. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established.

The seasonal high water table, the slope, and the shrink-swell potential are limitations if this soil is used as a site for dwellings with basements. They can be overcome by installing subsurface tile drains near the foundation; by cutting, filling, and land shaping; and by extending the footings below the subsoil or reinforcing the foundations.

If this soil is used as a site for septic tank absorption fields, the seasonal high water table and the slope are



Typically, the surface layer is very dark grayish brown, friable silty clay loam about 8 inches thick. It is mixed with some dark yellowish brown material. The subsoil is friable silty clay loam about 40 inches thick. The upper part is dark yellowish brown, and the lower part is

limitations. Subsurface tile drains lower the water table. Installing the distribution lines on the contour or cutting and land shaping help to overcome the slope.

The land capability classification is IIIe.

slightly acid. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture, and hay. It is poorly suited to dwellings and septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, the wetness can delay planting in the spring. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed. A conservation tillage system that leaves crop residue on the surface after planting helps to maintain productivity and tilth.

If this soil is used as a site for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Installing subsurface tile drains near the foundations helps to overcome the wetness. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderately slow permeability are limitations if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Grading and land shaping help to dispose of excess surface water. Increasing the size of the filter field or replacing the soil with more

seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during the spring. Available water capacity is high. Organic matter content is moderate. The surface layer is slightly acid because of local liming practices. The subsoil is medium acid. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is well suited to cultivated crops, openland wildlife habitat, and wetland wildlife habitat and is moderately suited to pasture and hay. It is generally unsuited to dwellings and septic tank absorption fields because of the ponding.

This soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Surface drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

If this soil is used for pasture and hay, the ponding is a hazard. It can be controlled by surface drains, ditches, and surface inlet tile. Deferment of grazing when the soil is too wet helps to prevent surface compaction and

the landscape. They make up 10 to 15 percent of the unit.

Air and water move through the Sable soil at a moderate rate. Surface runoff is slow or ponded in cultivated areas. The seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below during the spring. Available water capacity is very high. Organic matter content is high. Reaction is neutral in the surface soil and subsoil. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings and is generally unsuited to septic tank absorption fields because of the ponding.

This soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Subsurface tile drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding. Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction and crusting, and increase the rate of water intake.

If this soil is used as a site for dwellings, the ponding is a hazard. This hazard can be reduced by diverting surface water or constructing the building on raised fill material. Subsurface tile drains and surface inlet tile drains help to lower the water table.

The land capability classification is IIw.

74—Radford silt loam. This nearly level, somewhat poorly drained soil is on flood plains and the bottom of upland drainageways. It is occasionally flooded for brief periods from March through May. Individual areas are long and narrow and range from 3 to 100 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 9 inches thick. The subsurface layer and underlying material also are very dark gray, friable silt loam. The subsurface layer is about 11 inches thick. The underlying material is about 6 inches thick. It has thin strata of yellowish brown material. The lower part of the profile to a depth of 60 inches is a buried soil. It is black, friable and firm silty clay loam. In some places the underlying material is silt loam to a depth of more than 40 inches. In other places the surface soil is lighter colored.

Included with this soil in mapping are small areas of the well drained Huntsville and poorly drained Sawmill soils. Huntsville soils do not have a buried soil. They are on the higher parts of the landscape and are not subject to flooding. Sawmill soils contain more clay in the surface layer than the Radford soil. They generally are in the slightly lower positions on the wider parts of the [illegible] included soils make up 5 to 15 percent of

Air and water move through the Radford soil at a moderate rate. Surface runoff is slow in cultivated areas. The seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is very high. Organic matter content is moderate. The soil is slightly acid in the upper part and mildly alkaline in the lower part. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops and to openland wildlife habitat. It is moderately suited to wetland wildlife habitat and to pasture and hay. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard and the wetness is a limitation. Dikes or diversions can reduce the extent of the crop damage caused by floodwater in some years. Selecting crop varieties adapted to shorter growing seasons and wetter conditions also reduces extent of this damage. Subsurface tile drains function satisfactorily if suitable outlets are available. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

If this soil is used for forage or hay, the flooding is a hazard and the seasonal wetness is a limitation. Dikes and diversions help to control the flooding, and subsurface tile drains lower the water table. Overgrazing causes surface compaction and poor tilth. Proper stocking rates, rotation grazing, restricted use during wet periods, and applications of fertilizer help to keep the pasture in good condition. The flooding delays harvesting of hay in some years.

The land capability classification is IIw.

77—Huntsville silt loam. This nearly level, well drained soil is on flood plains near streams. It is occasionally flooded for brief periods from March through May. Individual areas are long and narrow and range from 2 to 300 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is friable silt loam about 42 inches thick. The upper part is very dark grayish brown, the next part is dark brown, and the lower part is brown. The underlying material to a depth of 60 inches is dark brown, friable silt loam. In places the surface layer and subsurface layer are thinner. In some areas the soil contains more sand. In other areas the depth to the seasonal high water table is less than 6 feet.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion and poorly drained Sawmill soils. These soils are in the slightly lower landscape positions farther away from the streams. They make up 5 to 10 percent of the unit.

Air and water move through the Huntsville soil at a [illegible]

content is moderate. Reaction in the surface layer generally is slightly acid but varies because of local liming practices. Reaction in the subsurface layer is

helps to maintain productivity and tilth and helps to control erosion. A drainage system helps to dry out the soil in the spring. Subsurface tile drains function satisfactorily if suitable outlets are available.

tile drains function satisfactorily if suitable outlets are available. A conservation tillage system that leaves crop

dwellings and septic tank absorption fields because of the flooding.

residue on the surface after planting helps to maintain tilth and productivity.

Adapted forage and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as a site for dwellings, the seasonal high water table is a limitation. Installing subsurface tile drains near the foundation helps to overcome this limitation.

The seasonal high water table and the moderate permeability are limitations if this soil is used as a site for septic tank absorption fields. Subsurface tile drains lower the water table. Grading and land shaping help to

If this soil is used for corn, soybeans, or small grain, the flooding is a hazard and the wetness is a limitation. Flooding occurs less often than once every 2 years during the growing season. The soil is sufficiently drained for corn, soybeans, and small grain. Measures that maintain or improve the drainage system are needed. Subsurface tile drains function satisfactorily if suitable outlets are available. Dikes or diversions can reduce the extent of the crop damage caused by floodwater. A conservation tillage system that leaves crop residue on the surface after planting improves tilth, helps to prevent surface compaction and crusting, and increases the rate of water intake.

If this soil is used as woodland, the equipment limitation, seedling mortality, and windthrow are management concerns. They are caused by the wetness. Plant competition also is a concern. It affects

surface layer is darker and thicker. In some areas soil subsurface tile drains near the foundations lowers the

management concern. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that can withstand droughty conditions, by eliminating all competing vegetation near the seedlings, and by selecting the larger seedlings for planting. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

The land capability classification is IVe.

131B—Alvin sandy loam, 2 to 6 percent slopes. This gently sloping, well drained soil is on stream terraces along the major stream valleys. Individual areas are irregular in shape and range from 2 to 20 acres in size.

Typically, the surface layer is brown, friable sandy loam about 4 inches thick. The subsurface layer is brown, friable fine sandy loam about 6 inches thick. The subsoil is about 32 inches thick. The upper part is strong brown, friable sandy loam, and the lower part is strong brown, loose sandy loam that has loamy sand strata. The underlying material to a depth of 60 inches is yellowish brown, loose, stratified sandy loam and loamy sand. In some places the subsoil is thinner and contains

Adapted forage and hay plants grow well on this soil. Timely deferment of grazing helps to prevent overgrazing and thus a greater susceptibility to erosion and soil blowing. The plants should not be grazed until they are sufficiently established. Applications of fertilizer are needed.

The land capability classification is IIe.

131D—Alvin sandy loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes bordering the major stream valleys. Individual areas are long and narrow and range from 3 to 30 acres in size.

Typically, the surface layer is very dark gray, friable sandy loam about 5 inches thick. The subsurface layer is about 15 inches thick. It is dark grayish brown and yellowish brown, friable fine sandy loam and sandy loam. The subsoil is strong brown, friable sandy loam about 25 inches thick. It has pockets of loamy sand in the lower part. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable, stratified sandy loam, loamy sand, and sand. In places the underlying material contains less sand and more silt. In some areas the subsoil is thinner and contains less clay. In other areas the underlying material is glacial till.

Included with this soil in mapping are small areas of the moderately well drained Elco soils. These soils have more clay and less sand throughout the subsoil and underlying material than the Alvin soil and are moderately slowly permeable. They are in landscape positions similar to those of the Alvin soil. They make up

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the

desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Logging roads and skid trails should be established on the contour if possible. On the steeper slopes, the logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded

Adapted pasture and hay plants grow well on this soil. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation that includes 1 or more years of forage crops in the

percent. In other areas the loamy material is closer to the surface.

Included with this soil in mapping are small areas of

Cutting, filling, and land shaping help to overcome the slope.

If this soil is used as a site for septic tank absorption

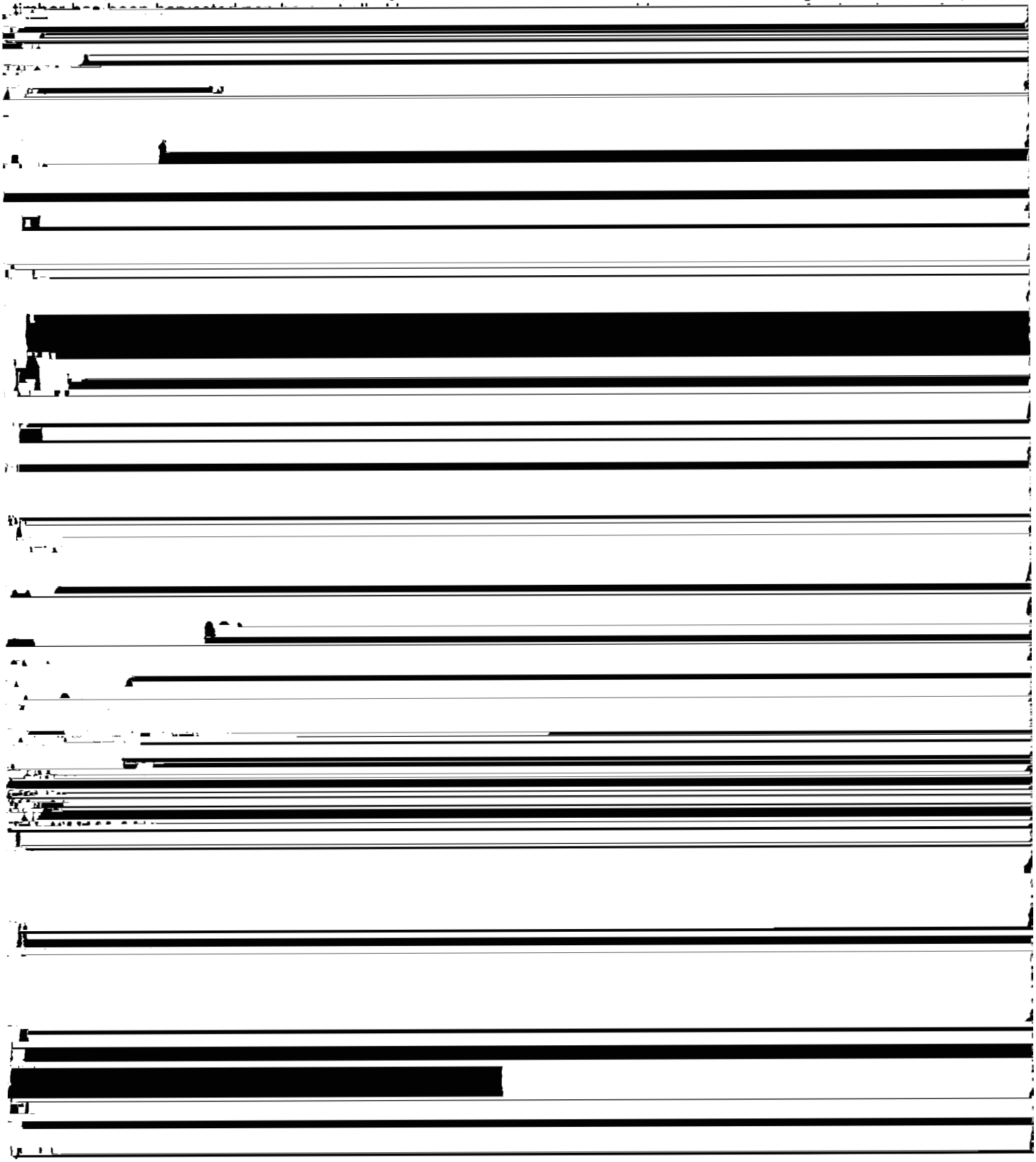
more clay throughout the subsoil than the Camden soil. They are in landscape positions similar to those of the Camden soil. They make up 10 to 15 percent of the unit.

Air and water move through the Camden soil at a

permeability, and the slope are limitations. Subsurface tile drains lower the water table. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderate permeability. Installing the distribution lines on the contour or cutting

desirable species. The competition in openings where

This soil can be used for the grain and seed crops and



susceptibility to erosion. Proper stocking rates, pasture

1 or more years of forage crops, a conservation tillage

Air and water move through the upper part of the subsoil in the Assumption soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid in cultivated areas. The seasonal high water table is 3.0 to 4.5 feet below the surface during the spring. The surface layer is slightly acid because of local liming practices. The subsoil is medium acid. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops. It is well suited to pasture and hay and to openland wildlife habitat. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and productivity.

Adapted forage and hay plants grow well on this soil. Overgrazing causes surface compaction, excessive runoff, and a greater susceptibility to erosion. Proper stocking rates, rotation grazing, and timely deferment of grazing help to prevent overgrazing. Tilling on the contour when a seedbed is prepared or the pasture is renovated helps to control erosion. The plants should not be grazed or clipped until they are sufficiently established. Applications of fertilizer help to keep the pasture in good condition and thus helps to control erosion.

If this soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope also are limitations on sites for dwellings without basements. Installing subsurface tile drains near the foundations helps to overcome the wetness. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderately slow permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water. Increasing the size of the filter field or replacing the soil with more permeable material helps to overcome the moderately slow absorption of liquid waste.

The land capability classification is IIIe.

259D3—Assumption silty clay loam, 8 to 15 percent slopes, severely eroded. This strongly sloping, moderately well drained soil is on shoulder slopes and side slopes in the uplands. Individual areas are long and narrow and range from 3 to 20 acres in size.

Typically, the surface layer is very dark grayish brown, friable silty clay loam about 5 inches thick. The subsoil is about 55 inches thick. It is mottled below a depth of 20 inches. The upper part is brown and dark yellowish brown, firm silty clay loam, and the lower part is grayish brown, firm clay loam. In places the surface layer is thinner and lighter colored.

Included with this soil in mapping are small areas of the poorly drained Coatsburg soils. These soils have a firm subsoil within 20 inches of the surface and are very slowly permeable. They are in landscape positions similar to those of the Assumption soil. They make up 2 to 5 percent of the unit.

Air and water move through the upper part of the subsoil in the Assumption soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid in cultivated areas. The seasonal high water table is 3.0 to 4.5 feet below the surface during the spring. Available water capacity is high. Organic matter content is moderately low. The surface layer is slightly acid because of local liming practices. The subsoil is also slightly acid. The surface layer puddles and crusts easily after rains. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is poorly suited to cultivated crops. It is moderately suited to pasture and hay and is well suited to openland wildlife habitat. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, further erosion is a hazard and poor tilth is a limitation. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material improve tilth, help to prevent surface crusting, and increase the rate of water intake.

Establishing pasture and hay crops helps to keep soil loss within tolerable limits. Seedbed preparation is difficult on side slopes where the subsoil is exposed. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion. The plants should not be grazed or clipped until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and prevent surface compaction and excessive runoff.

If this soil is used as a site for dwellings with basements, the seasonal high water table, the slope, and the shrink-swell potential are limitations. The shrink-swell potential and the slope also are limitations on sites for dwellings without basements. Installing subsurface

tile drains near the foundations helps to overcome the wetness. Cutting, filling, and land shaping help to overcome the slope. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderately slow permeability are limitations if this soil is used as a site for septic tank absorption fields. Installing subsurface tile drains higher on the side slopes than the absorption field helps to intercept seepage water.

the surface after planting, by contour farming, or by terraces.

Adapted forage and hay plants grow well on this soil. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, plant competition is a

Air and water move through the Rozetta soil at a moderate rate. Surface runoff is medium in cultivated

280B—Fayette silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is predominantly on

below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on upland side slopes. Individual areas are irregular in shape and range from 6 to 400 acres in size.

Typically, the surface layer is brown, friable silt loam about 10 inches thick. The subsoil is silty clay loam about 41 inches thick. The upper part is dark yellowish brown and firm, and the lower part is yellowish brown,

mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-swell potential is a limitation. Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIIe.

280D2—Fayette silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on upland side slopes. Individual areas are long and narrow

seedbed is prepared or when the pasture is renovated helps to control erosion.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect

excessive runoff, and a greater susceptibility to erosion. Proper stocking rates and timely deferment of grazing help to prevent overgrazing. Applications of fertilizer are needed. The plants should not be grazed or clipped until they are sufficiently established. Tilling on the contour when a seedbed is prepared or the pasture is renovated help to keep the pasture in good condition and help to control erosion.

If this soil is used as woodland, the erosion hazard and the equipment limitation are management concerns

Most areas are cultivated. This soil is well suited to cultivated crops, pasture, and hay. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.

Adapted forage and hay plants grow well on this soil. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of

strongly acid. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is well suited to cultivated crops, pasture and hay, and woodland. It is moderately suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, erosion is a hazard. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.

Adapted forage and hay plants grow well on this soil. Overgrazing reduces forage yields, causes surface compaction and excessive runoff, and increases the

Sawmill soils. Huntsville soils are nearer to the streams than the Orion soil and are slightly higher on the landscape. Sawmill soils contain more clay than the Orion soil. They are in old oxbows in the lower areas. Included soils make up 10 to 15 percent of the unit.

Typically, the surface layer is very dark grayish brown, friable silt loam about 12 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 19 inches thick. The underlying material to a depth of 60 inches is stratified dark grayish brown

More than 85 percent of this map unit is covered by pavement and buildings. The paved areas are in parking lots; on sites for educational institutions, commercial facilities, and shopping centers; and in the switch yard of the Burlington Northern Railroad.

Included with this unit in mapping are small areas of silty Orthents. These soils make up less than 15 percent of the unit.

Urban land is drained through sewer systems, gutters, and tile drains. Because runoff is rapid, the supply of water available for trees and shrubs generally is low.

Vegetated areas make up less than 10 percent of this map unit. The vegetation consists mainly of grasses at the border of the urban areas and widely spaced trees and shrubs. Various species of weeds and grasses grow in a few idle spots along the edge of built-up areas. Special management increases the survival rate when trees and shrubs are planted and after they are established. Periodically providing supplemental water also helps the plants to survive.

This map unit has not been assigned a land capability classification.

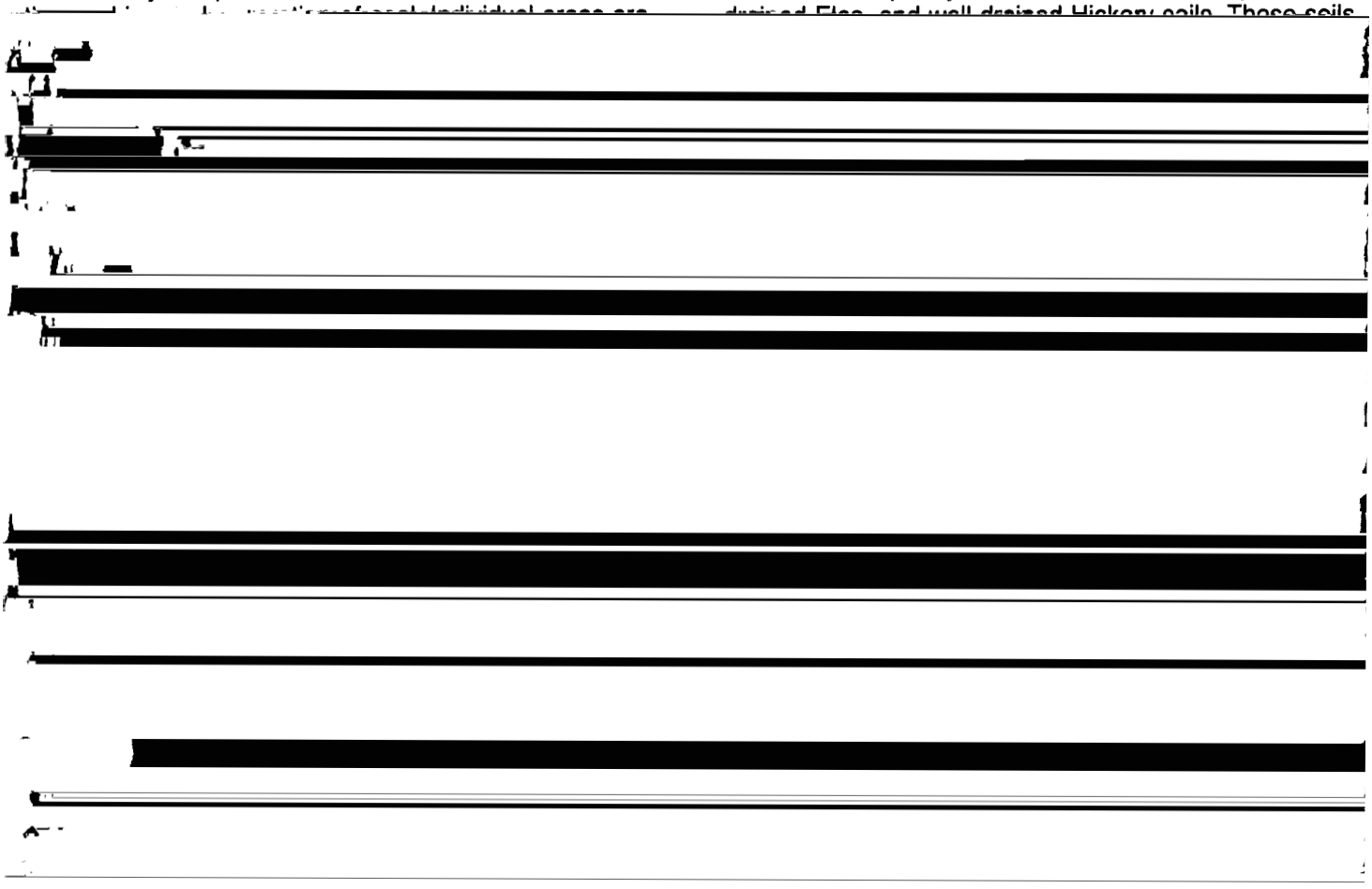
536—Dumps, mine. This map unit consists of nearly level to very steep accumulations of refuse derived from [illegible] reclamation should be determined by onsite investigation.

This map unit has not been assigned a land capability classification.

549D2—Marseilles silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on upland side slopes and foot slopes. Individual areas are long and narrow and range from 3 to 60 acres in size.

Typically, the surface layer is brown, friable silt loam about 4 inches thick. The subsoil is silty clay loam about 32 inches thick. The upper part is yellowish brown and friable, and the lower part is mottled olive gray, light olive gray, and light olive brown and is firm. Light gray and light olive gray, firm shale and siltstone bedrock that crushes to silty clay loam is at a depth of about 36 inches. In some places the lower part of the subsoil and the underlying material contain more sand and sandstone. In other places the slope is less than 10 percent. In some areas the soil has calcareous underlying material and has a thinner silty layer. In other areas the surface layer and subsoil contain more clay.

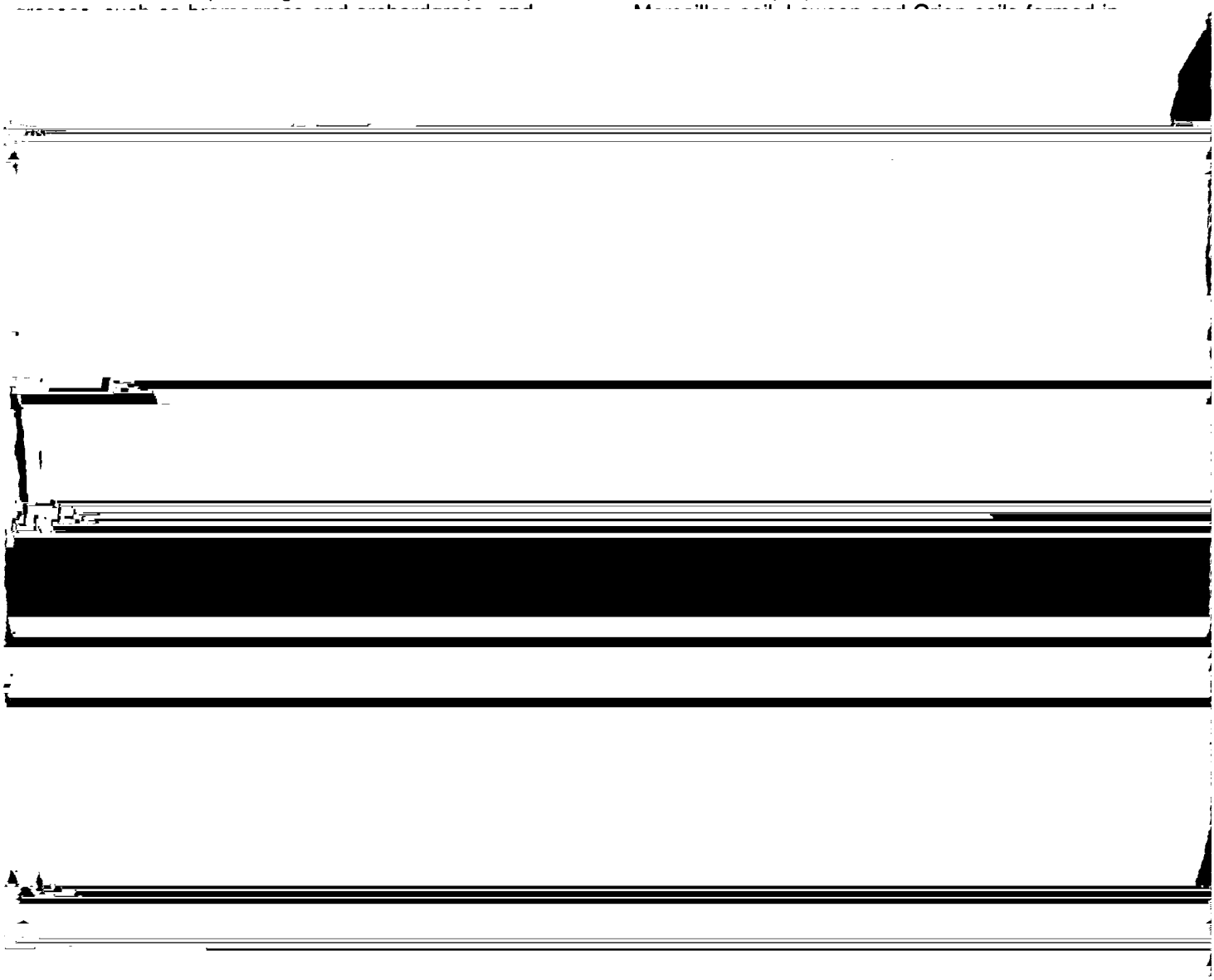
Included with this soil in mapping are small areas of the somewhat poorly drained Atlas, moderately well [illegible] soils. These soils



established. Planting the pasture species on the contour helps to control erosion.

Wild herbaceous plants, grain and seed crops, [illegible]

They are on side slopes above the Marseilles soil. Hickory soils formed predominantly in glacial till. They are in landscape positions similar to those of the [illegible]



legumes, such as ladino clover, alsike clover, and red clover, can provide food and cover for openland wildlife. Measures that protect the habitat from grazing are needed.

If this soil is used as woodland, plant competition is a management concern. It affects the seedlings of desirable species. The competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots. Measures that protect the woodland from fire are needed.

If this soil is used as a site for dwellings, the shrink-[illegible]

alluvium and are in the drainageways. Included soils make up 10 to 15 percent of the unit.

Air and water move through the upper part of the Marseilles soil at a moderate rate and through the underlying shale and siltstone at a slow rate. Surface runoff is rapid in wooded areas. Available water capacity is low. Organic matter content is moderately low. The surface layer is slightly acid, and the subsoil is medium acid. The soft shale and siltstone bedrock at a depth of 20 to 40 inches restricts the growth of roots. The shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are used for woodland and for woodland wildlife habitat. Some areas of timber also are used for

549G—Marseilles silt loam, 30 to 60 percent slopes. This very steep, well drained soil is on upland side slopes and foot slopes. Individual areas are long

damage to tree roots. Measures that protect the woodland from fire are needed.

This soil is suitable for grain and seed crops, for wild

Figure 8.—A wooded area of Marseilles silt loam, 30 to 60 percent slopes.

Reinforcing the foundation or extending the foundation below the subsoil helps to overcome this limitation.

The land capability classification is IIe.

567C2—Elkhart silty clay loam, 5 to 10 percent slopes, eroded. This sloping, well drained soil is on upland side slopes and at the head of drainageways.

calcareous, friable silt loam. In places, the subsoil is thicker and the depth to free lime is more than 40 inches. In some areas the lower part of the subsoil is firm and is higher in content of clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Radford soils. These soils are in the drainageways, formed in alluvium, and are

shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. This soil is moderately suited to cultivated crops and to dwellings without basements. It is well suited to pasture and hay, to dwellings with basements, and to septic tank absorption fields.

In areas used for corn, soybeans, or small grain, further erosion is a hazard. It can be controlled by a crop rotation that includes I or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, by terraces, or by a combination of these. Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

shrink-swell potential is moderate, and the potential for frost action is high.

Most areas are cultivated. The soil is poorly suited to cultivated crops and well suited to pasture and hay. It is moderately suited to openland wildlife habitat, to dwellings, and to septic tank absorption fields.

If this soil is used for corn, soybeans, or small grain, further erosion is a hazard and poor tilth is a limitation. A crop rotation dominated by forage crops and a combination of contour farming and a conservation tillage system that leaves crop residue on the surface after planting help to keep soil loss within tolerable limits. Stripcropping also helps to control erosion. Returning crop residue to the soil and regularly adding other organic material improve tilth and increase the rate of

Hickory soils formed predominantly in glacial till and have less clay in the subsoil than the Coatsburg soil. They are on the steeper side slopes. Included soils make up 5 to 10 percent of the unit.

Air and water move through the Coatsburg soil at a very slow rate. Surface runoff is medium in cultivated areas. A perched seasonal high water table is within 1 foot of the surface during the spring. Available water capacity is moderate. Organic matter content also is moderate. The subsoil is strongly acid. Root development is restricted by the firm subsoil. The shrink-swell potential and the potential for frost action are high.

Most areas are cultivated. This soil is moderately suited to cultivated crops, to pasture and hay, and to openland wildlife habitat. It is poorly suited to dwellings and septic tank absorption fields.

In areas used for corn, soybeans, or small grain, further erosion is a hazard. It can be controlled by a crop rotation that includes 1 or more years of forage crops, by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by a combination of these. Keeping tillage to a minimum, returning crop residue to the soil, and regularly adding other organic material help to maintain productivity, prevent surface compaction and crusting, and improve tilth.

Establishing pasture plants and hay helps to control erosion. Overgrazing causes surface compaction, excessive runoff, and a greater susceptibility to erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the

Typically, these soils are dark yellowish brown and dark grayish brown, mottled silty clay loam and silt loam to a depth of 60 inches. In some areas they are covered with as much as 2 feet of coarser textured fill material, which includes gravel and stones. In other areas the content of sand is more than 15 percent.

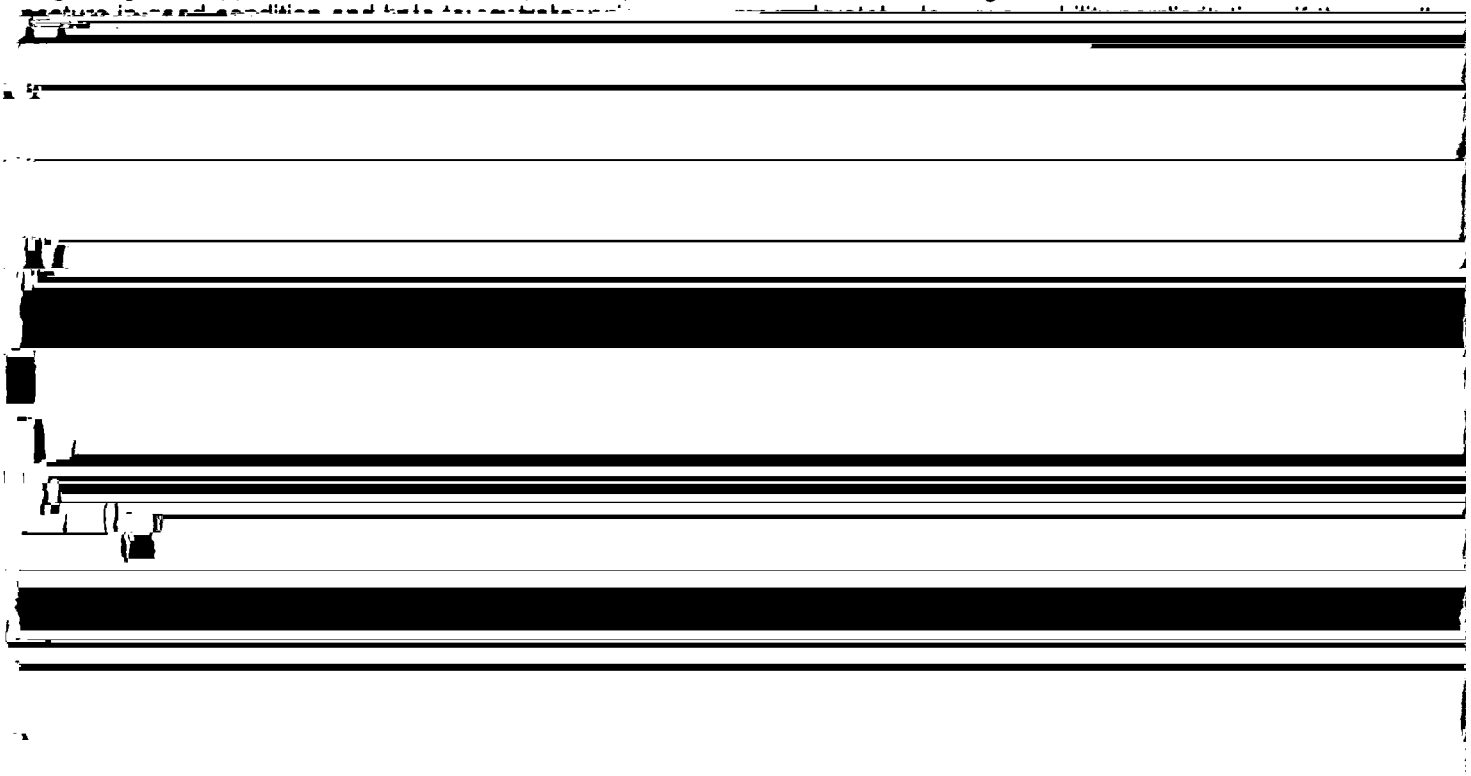
Included with these soils in mapping are some areas of Urban land and borrow areas near Interstate 74 and other major highways. Also included are small areas of Ipava, Sable, and Tama soils and a few areas around the cloverleaf interchanges where the soils are sloping or strongly sloping. Included soils make up 10 to 15 percent of the unit.

Air and water move through the Orthents at a moderate or moderately slow rate. Surface runoff is slow or medium. The seasonal high water table is 1 to 3 feet below the surface during the spring. Available water capacity is high. The shrink-swell potential is moderate or high, and the potential for frost action is high.

Most areas are used as sites for homes, roadways, or commercial buildings. These soils are moderately suited to picnic areas and playgrounds and are poorly suited to dwellings, local roads and streets, and septic tank absorption fields.

The seasonal high water table and the shrink-swell potential are the main limitations if these soils are used as sites for dwellings. Installing subsurface tile drains near the foundation reduces the wetness. Extending footings or reinforcing foundations helps to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the moderate or



the fill was added. In other areas the landfill material was placed directly on natural soil. Individual areas are irregularly shaped or rectangular and range from 4 to 30 acres in size.

These soils are a mixture of rocks, concrete, bricks, [illegible] tires, aluminum, steel scraps, trash, and other

thick enough to support vegetation. The unit occurs as one irregularly shaped area about 80 acres in size.

The rate of air and water movement through the soil material varies. Surface runoff is rapid in the more sloping areas and ponded on the bottom of the excavations.

Figure 9.—A water-filled area of Pits, clay.

calcareous, friable channery loam. Shale channers are common throughout the soil.

Included with this soil in mapping are small areas of haulage roads and, adjacent to pits and the final cut, some steep and very steep areas that are not leveled. Also included are shallow trenches and depressions, some containing water, and a few areas of deep water. Included areas make up 10 to 15 percent of the unit.

Air and water move through the Lenzburg soil at a [illegible]. Surface runoff is slow or medium [illegible]

surface layer and mildly alkaline in the upper part of the underlying material. The supply of available phosphorus is low. The content of rock fragments ranges from 10 to 35 percent by volume. Surface crusting is common after hard rains. Some differential settling can occur. The rock and dense soil fragments in the underlying material tend to restrict roots. The shrink-swell potential and the potential for frost action are moderate.

Most areas are used for pasture and hay. This soil is [illegible]

moderately suited to woodland, to dwellings, and to

Typically, the surface layer is dark brown, friable silt

cable and winch. Firebreaks should be the grass type. Bare logging areas should be seeded to grass or to a grass-legume mixture. Machinery should be used only when the soil is firm enough to support the equipment. The plant competition in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch

material. The supply of available phosphorus is low. The content of rock fragments ranges from 10 to 35 percent by volume. Crusting and sealing of the surface layer are common after hard rains. Some areas are subject to differential settling and slumping. The rock and dense soil fragments in the underlying material tend to restrict roots. The shrink-swell potential and the potential for frost action are moderate.

872B—Rapatee silty clay loam, 1 to 7 percent

Increasing the size of the filter field or replacing the soil

Figure 10.—Corn and wheat on Rapatee silty clay loam, 1 to 7 percent slopes.

replacing the base material; by grading and land shaping. Typically, the Ipava soil has a surface layer of black

Typically, the Tama soil has a surface layer of black, [illegible] about 8 inches thick. The subsurface layer is very dark gray, friable silt loam about 4 inches thick. The subsoil is silty clay loam about 34 inches thick. The upper part is brown and dark yellowish brown and is friable, and the lower part is yellowish brown, mottled, and friable. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In places the surface layer is lighter colored and thinner. In some areas the surface layer and the upper part of the subsoil have been altered by cutting and leveling during construction.

Included with this unit in mapping are small areas of the poorly drained Sable soils in drainageways and broad depressions. These soils make up 5 to 10 percent of the unit.

Air and water move through the Ipava soil at a moderately slow rate and through the Tama soil at a moderate rate. Surface runoff is slow on the Ipava soil and medium on the Tama soil. Most areas are drained by [illegible] and drainage tile. In areas that

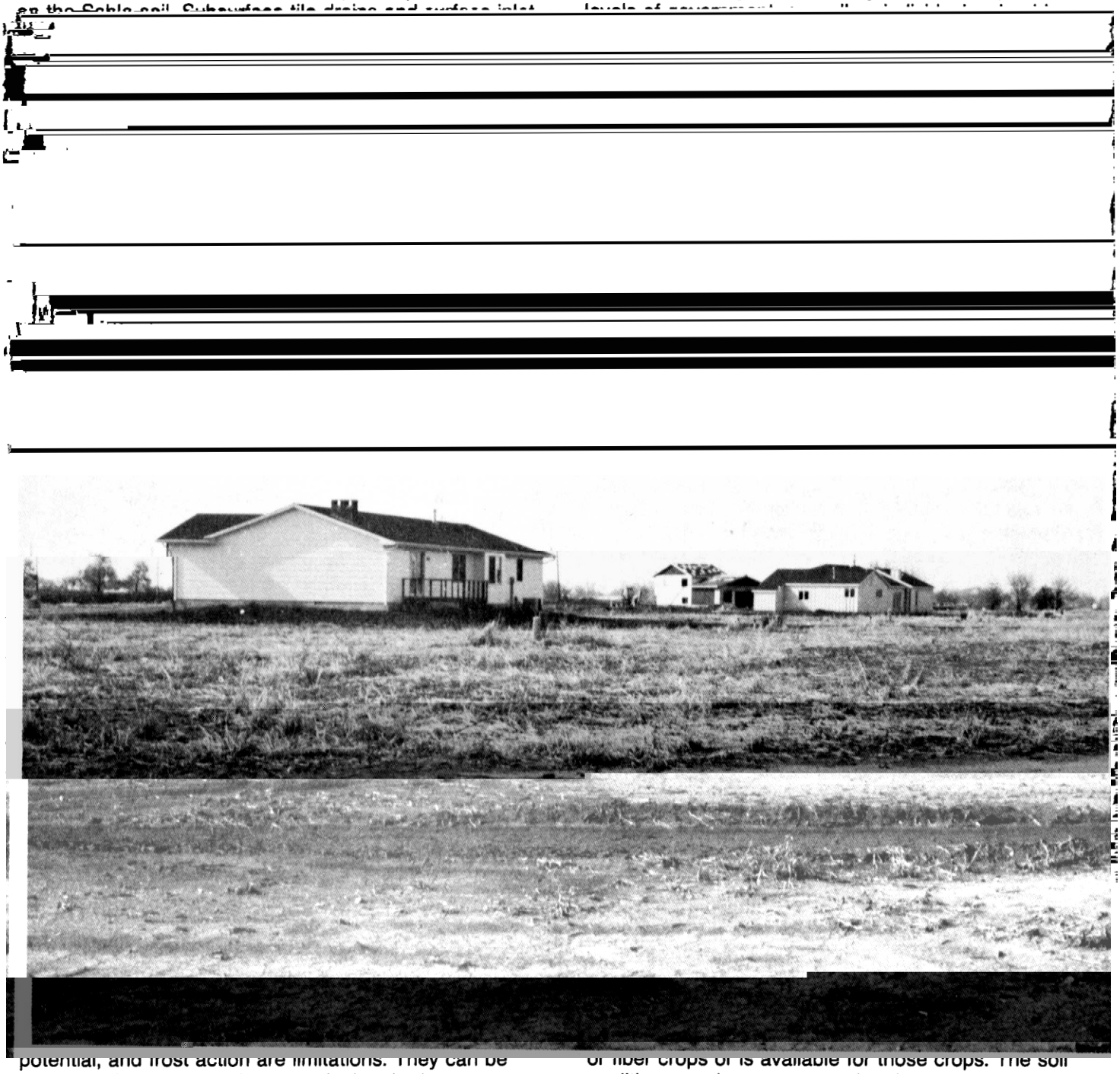
This map unit has not been assigned a land capability classification.

2902A—Ipava-Urban land-Sable complex, 0 to 3 percent slopes. This nearly level map unit occurs as areas of a somewhat poorly drained Ipava soil on smooth upland flats intermingled with areas of Urban land and a poorly drained Sable soil on broad upland flats, in shallow depressions, and in drainageways. The Sable soil is occasionally ponded for brief periods. Individual areas are round or irregularly shaped and range from 40 to more than 500 acres in size. They are 35 to 45 percent Ipava soil, 25 to 35 percent Urban land, and 20 to 30 percent Sable soil. The Ipava and Sable soils and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Ipava soil has a surface layer of black, friable silt loam about 10 inches thick. The subsurface layer is very dark grayish brown, friable silty clay loam about 8 inches thick. The subsoil is about 32 inches thick. It is mottled and friable. The upper part is brown

The Ipava and Sable soils are used for parks, building sites, lawns, and gardens. The Ipava soil is moderately suited to lawns, landscaping, vegetable and flower gardens, and picnic areas. Both soils are poorly suited to dwellings and to local roads and streets.

If the Ipava and Sable soils are used as sites for dwellings, the seasonal high water table and the shrink-swell potential are limitations. Also, ponding is a hazard on the Sable soil. Subsurface tile drains and surface inlet



potential, and frost action are limitations. They can be overcome by strengthening or replacing the base

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

of fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 289,453 acres in Knox County, or 62 percent of the total acreage, meets the requirements for prime farmland. This land generally is used for crops, mainly corn and soybeans, which account for most of the local farm income each year.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses (fig. 11). The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Soils that have limitations, such as a seasonal high water table or frequent flooding during the growing season, qualify for prime farmland only in areas where these limitations have been overcome by such measures as drainage or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures.

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 avoid 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 behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Approximately 414,000 acres in Knox County was used as farmland in 1978 (*12*). About 85,000 acres of this farmland was used for pasture and hay. The acreage used for pasture and hay is decreasing because livestock confinement systems are increasing in number and more land is being used for row crops. Corn and soybeans, the main row crops, are grown on about 266,815 acres in the county. Winter wheat and oats are the most common close-growing crops. Forage crops include smooth bromegrass, orchardgrass, Kentucky bluegrass, alfalfa, and red clover. Sunflowers are grown in a few areas. They could be grown in many other areas. Vegetable and nursery crops can be grown on

Coatsburg soils; on soils that tend to be droughty, such as Alvin soils; and on soils that are already severely eroded, such as Sylvan soils. Second, erosion on farmland results in sedimentation in streams. Control of erosion minimizes this pollution and improves the quality of water available for municipal and recreation uses and for fish and other wildlife.

On clayey spots in many sloping fields, preparing a good seedbed and tilling are difficult because the original friable surface layer has been lost through erosion. Such spots are common in areas of the moderately eroded Assumption and Elkhart soils.

Measures that control erosion provide a protective plant cover, increase the rate of water infiltration, and reduce the runoff rate. A cropping system that keeps plants on the surface for extended periods reduces the susceptibility to erosion and preserves the productive capacity of the soils. On livestock farms, where pasture and hay are needed, including forage crops of grasses and legumes in the cropping sequence helps to control erosion in the more sloping areas. It also provides nitrogen and improves tilth for the following crop.

Terraces reduce the susceptibility to erosion by shortening the slopes and by controlling runoff. If a tile outlet terrace is used, the water that collects behind the terrace is removed by tile at a slow, controlled rate. Contour farming helps to control erosion through the formation of small ridges perpendicular to the slope of the land. The ridges greatly reduce the velocity of the water moving down the hills.

A conservation tillage system that leaves crop residue on the surface after planting is very effective in controlling erosion. This system creates a rough surface partly covered with crop residue. The crop residue increases the rate of water infiltration by improving tilth, protects the surface from the beating action of raindrops, helps to prevent surface crusting, and generally provides a more friable seedbed for good germination.

One system of conservation tillage used in Knox County is chisel tillage. When this system is applied, crop residue covers 20 to 60 percent of the surface, depending on the type of chisel plow used, the speed with which the equipment moves through the field, and [illegible]

combination used and its effectiveness depend on soil characteristics and topography. Information about the design of erosion-control practices for each kind of soil is provided in the Technical Guide, which is available in the local office of the Soil Conservation Service.

Soil blowing is a hazard on the Alvin sandy loams that are used for cultivated crops. Maintaining a plant cover or a surface mulch or keeping the surface rough through proper tillage minimizes this hazard. Field windbreaks also are effective in controlling soil blowing.

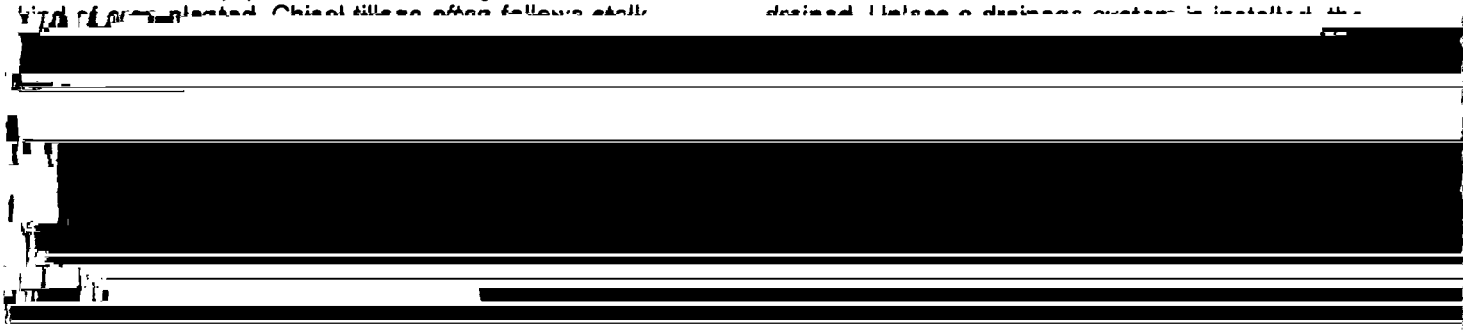
Soil tilth affects the germination of seeds and the rate of water infiltration. Some of the soils in Knox County have a silt loam surface layer that is low in content of organic matter. Generally, the structure of such soils is weakened by tillage. A crust forms on the surface during periods of intensive rainfall. The crust is hard when dry and is nearly impervious to water. As a result, it reduces the infiltration rate and increases the runoff rate and the susceptibility to erosion. Regular additions of crop residue, manure, and other organic material improve soil structure and help to prevent crusting. A conservation tillage system that leaves crop residue on the surface after planting also helps to prevent crusting.

Tilth can be a problem in the poorly drained, dark Edinburg, Sable, and Sawmill soils, which have a silty clay loam surface layer. These soils stay wet until late in spring. If they are tilled when wet, they tend to be very cloddy when dry. As a result, preparing a good seedbed is difficult.

A surface layer of silt loam or silty clay loam commonly has a plowsole or plowpan in the lower part. This pan reduces the rate of water infiltration and can increase the runoff rate and thus the susceptibility to erosion.

Soil drainage is a management concern on much of the acreage used for crops and pasture in Knox County. Most of the soils are already tile drained, but many drainage systems are old and should be replaced if maximum efficiency is to be achieved.

Some soils are naturally so wet that the production of crops generally would not be possible without a drainage system. These are the poorly drained Denny, Edinburg, Sable, and Sawmill soils. Most of these soils have been [illegible]



soils in depressions, a combination of surface drains and tile drains is needed. The tile should be more closely spaced in the more slowly permeable soils than in the

Moderately suited soils are in capability class III. Severe limitations, including moderately steep slopes, wetness, and low available water capacity, affect the choice of

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

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless

boxelder, walnut, and American elm. The most common trees on the bottom land are cottonwood, sycamore, willow, white oak, and hickory.

Many of the existing stands can be improved by thinning out mature trees and trees of low value. Measures that protect the woodland from fire and grazing are needed. Logging trails and access roads are commonly on steep soils. Shaping and seeding these trails and roads and applying fertilizer immediately after harvest help to control erosion. Properly shaped and constructed water bars across the trails also help to control erosion. Interplanting is needed for maximum woodland production. Control or removal of competing vegetation, such as the trees of low value, is needed if seedlings are planted. A grass cover is needed between rows of seedlings planted on bare, sloping land.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not to exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality [illegible]

The *productivity class*, a number, represents an expected volume produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

Knox County has some areas of scenic and historic interest. These areas are used mainly for camping, hiking, fishing, sightseeing, picnicking, and boating. Public areas available for recreation include Lake Storey (fig. 12), Wolf Covered Bridge Historical Site, and Carl Sandburg Birthplace Historical Site. There are numerous private recreational areas, including several large lakes and sportsmen's clubs. Hiking, fishing, boating, and hunting are the major uses in these areas. Many of the sportsmen's clubs are in areas of mine spoil, where

Figure 12.—A recreational area adjacent to Lake Storey. This area is in the Rozetta-Elco-Clarksdale association.

12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Wild herbaceous plants are native or naturally

Wildlife area 1 consists of the Ipava-Sable, Tama-Ipava, and Lawson-Sawmill-Huntsville associations. The soils are nearly level to strongly sloping and are poorly drained to well drained. The Lawson-Sawmill-Huntsville association is subject to flooding.

This wildlife area is mainly cropland, much of which is [redacted] soils are fall plowed. Wildlife habitat is generally poor because of a lack of crop residue, herbaceous nesting and roosting cover, woody cover, and travel lanes or hedgerows.

Measures that can improve the habitat in this area include not mowing roadsides, waterways, and other areas until August, when nesting is complete; growing fine stemmed grasses, such as redtop, timothy, and smooth brome, instead of tall fescue in waterways and [redacted]

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. [redacted] *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

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use

shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a

the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to

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 final cover for a landfill should be suitable for plants. The surface layer

the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean

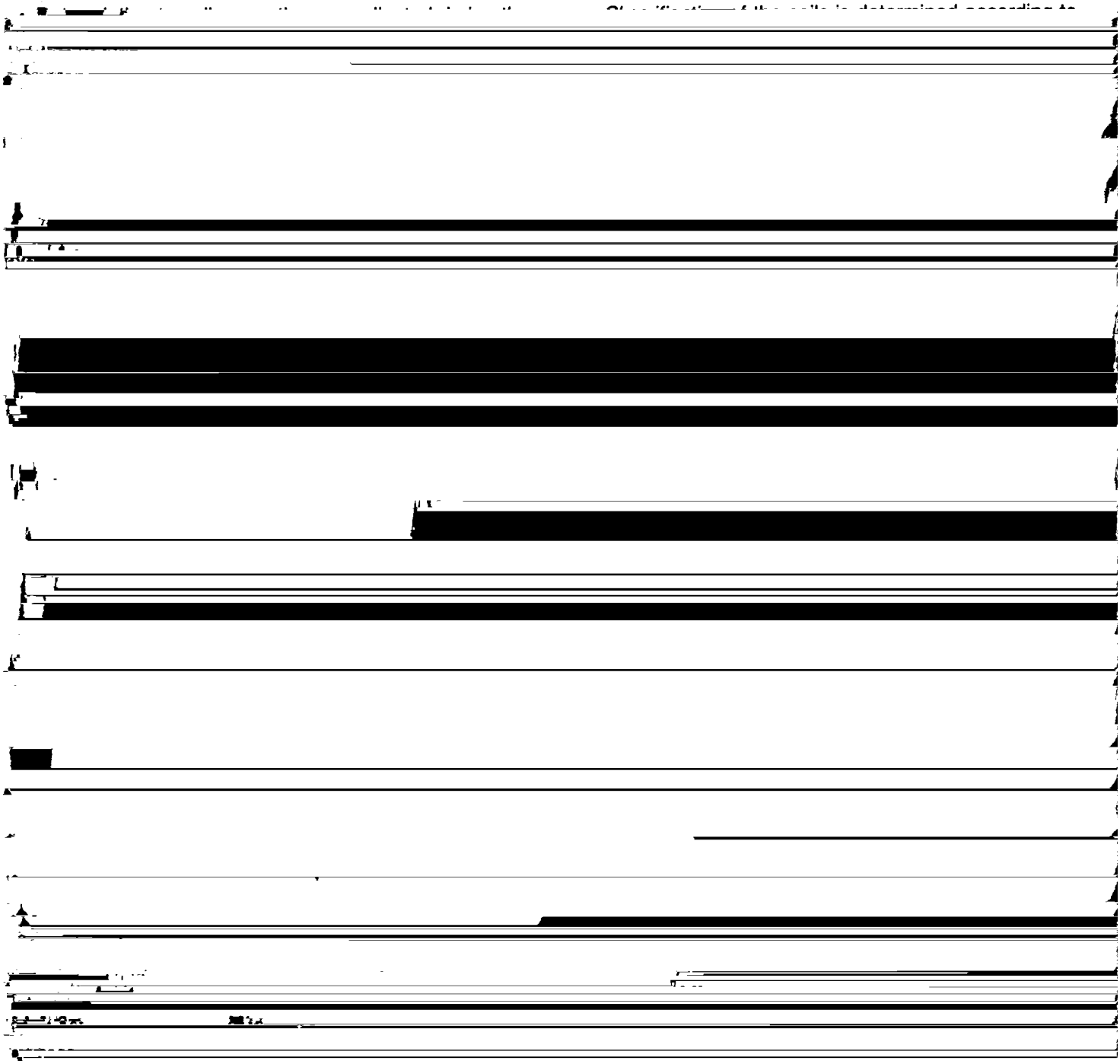
matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan,

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and

Soil Properties



estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the

water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than

susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, clay loams, and silty clay loams

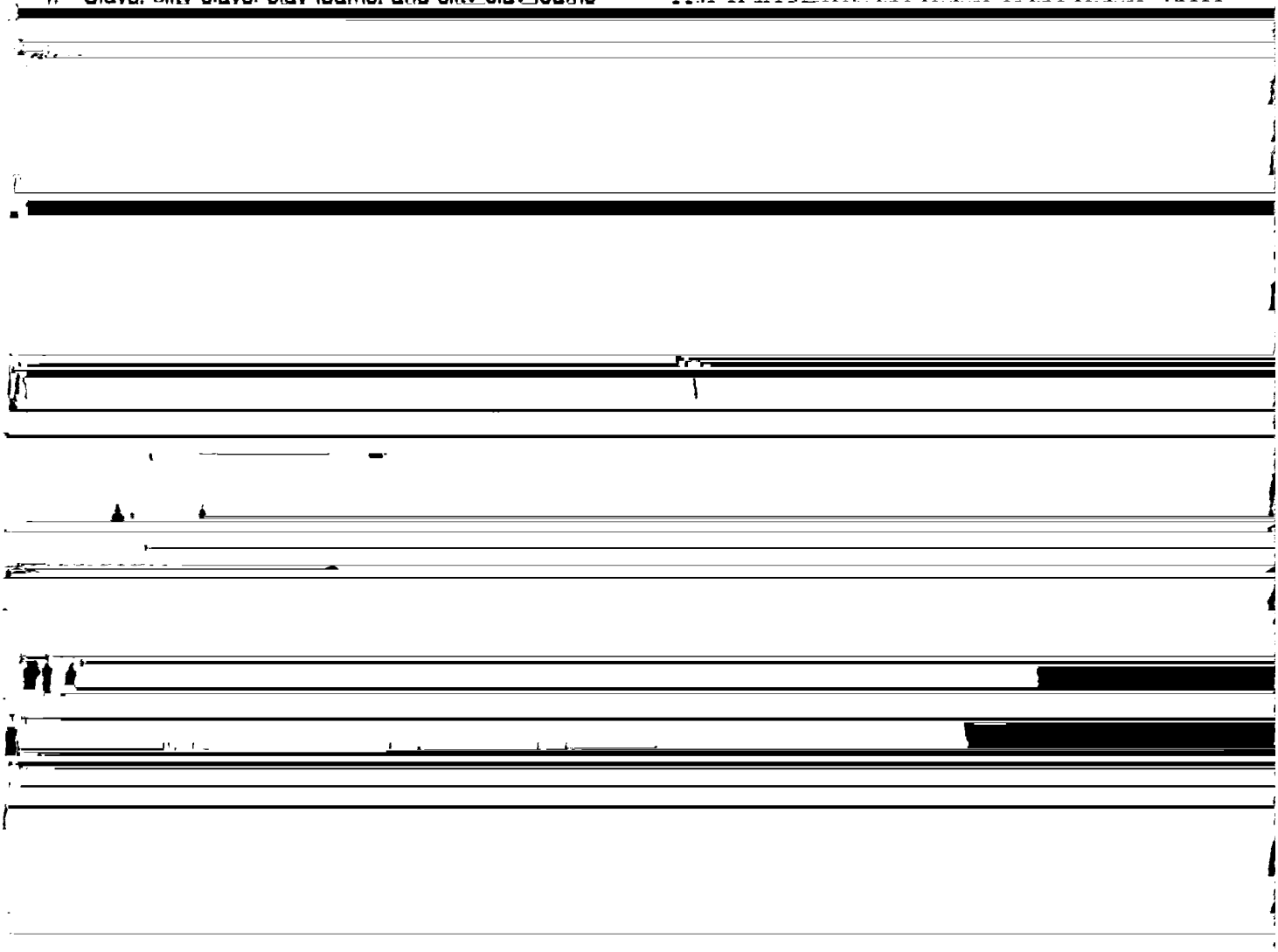
assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

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



Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The [illegible] in the range indicates how high

very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

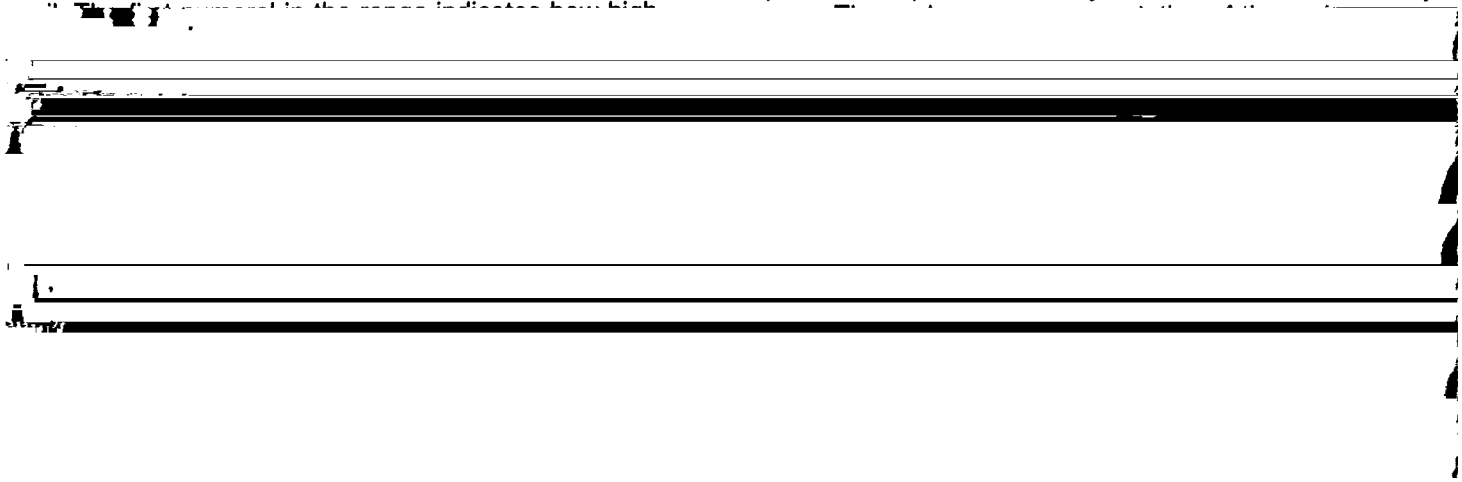
Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey [illegible]

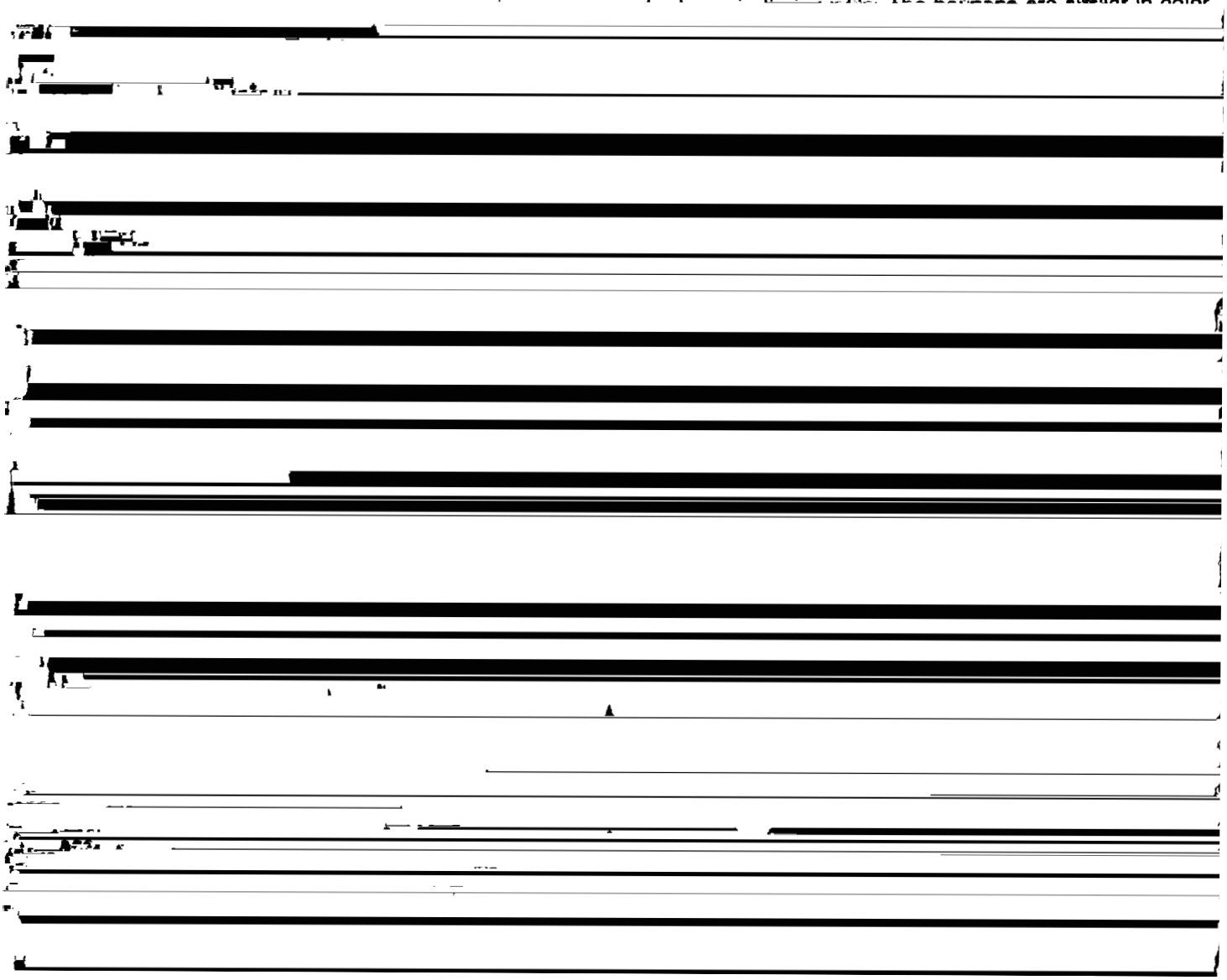


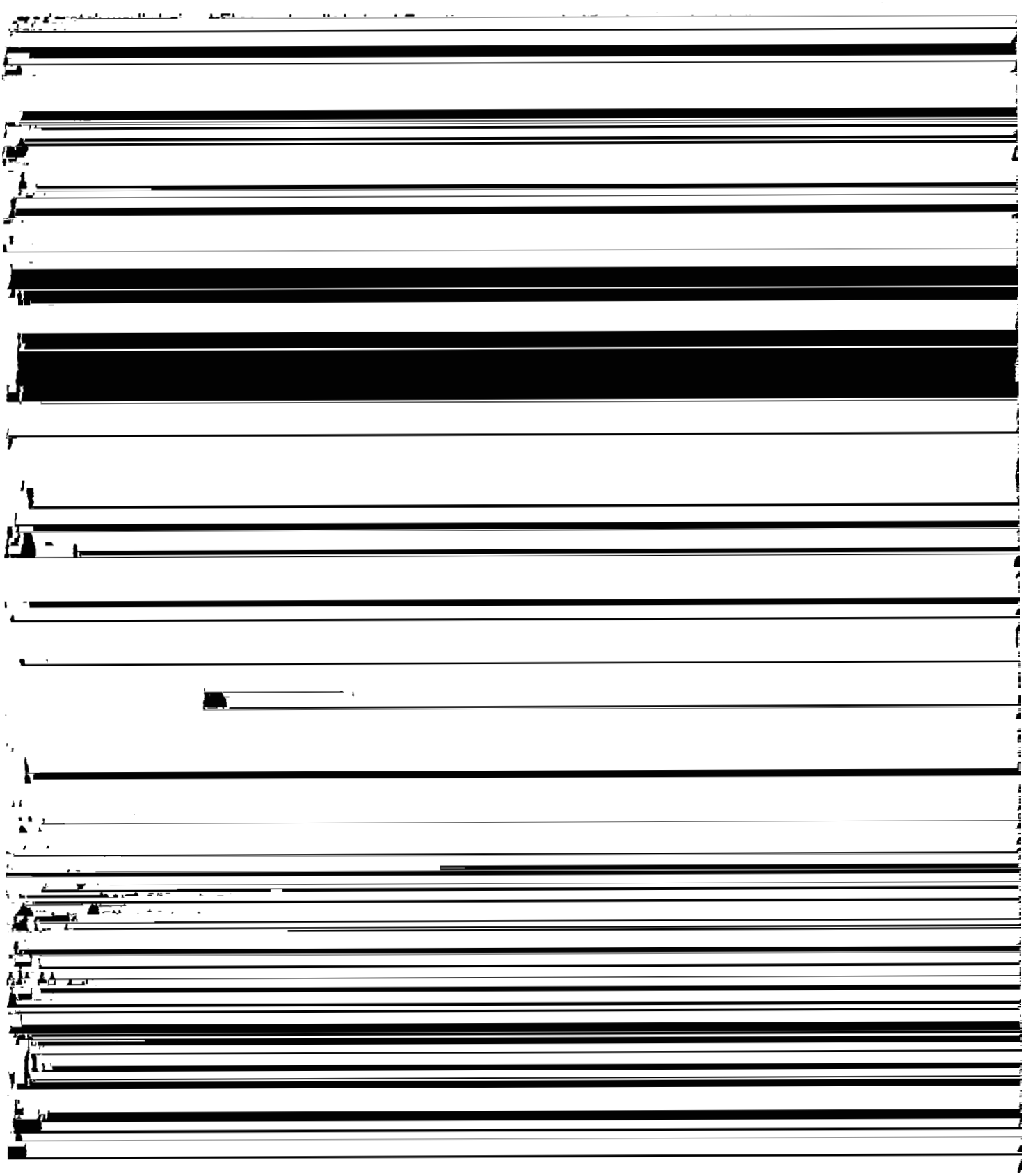
Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*11*). 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 19 shows the classification of the soils in the survey area. The

and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, mesic Typic Haplaquolls.

SERIES. The series consists of soils that have similar





inches; friable; few distinct very dark gray (10YR 3/1) organic films on faces of peds; slightly acid; abrupt smooth boundary.

Bt1—8 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium angular blocky structure; friable; common distinct brown (10YR 4/3) clay films and common distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; strongly acid; clear smooth boundary.

Bt2—18 to 26 inches; yellowish brown (10YR 5/6) silty clay loam; few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm;

Clarksdale Series

The Clarksdale series consists of somewhat poorly drained, moderately slowly permeable soils on uplands and stream terraces. These soils formed in loess. Slopes range from 0 to 2 percent.

Clarksdale soils are similar to Keomah and Ipava soils and commonly are adjacent to Downs, Ipava, and Keomah soils. Downs soils are moderately well drained, have less clay in the subsoil than the Clarksdale soils, and are on the slightly higher or more sloping parts of the landscape. The somewhat poorly drained Ipava and Keomah soils are in landscape positions similar to those of the Clarksdale soils. Ipava soils have a mollic

(10YR 5/6 and 5/8) and common medium faint light brownish gray (10YR 6/2) mottles; weak fine

prominent yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to

gray (10YR 3/1) organic films lining pores; common distinct brown (10YR 4/3) clay films on faces of peds; few fine stains on faces of peds and few fine concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—42 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; few distinct very dark gray (10YR 3/1) organic films lining pores; common medium stains on faces of vertical cracks and few

prominent very dark gray (10YR 3/1) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); few limestone pebbles; medium acid; abrupt smooth boundary.

2Btg2—16 to 25 inches; olive gray (5Y 5/2) clay loam; common fine prominent yellowish brown (10YR 5/4 and 5/8) mottles; weak medium prismatic structure; very firm; few prominent dark gray (10YR 4/1) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); few limestone

Ap— 0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; many fine faint grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure parting to weak medium granular; friable; few fine stains on faces of peds (iron and manganese oxides); slightly acid; clear smooth boundary.

A—4 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt wavy boundary.

Eg—9 to 19 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; many fine faint light gray (10YR 6/1) and many fine distinct dark brown (7.5YR 4/4) mottles; moderate thick platy structure; friable; medium acid; abrupt wavy boundary.

Btg1—19 to 21 inches; gray (10YR 5/1) silty clay loam; many fine distinct yellowish brown (10YR 5/8) mottles; strong very fine subangular blocky structure;

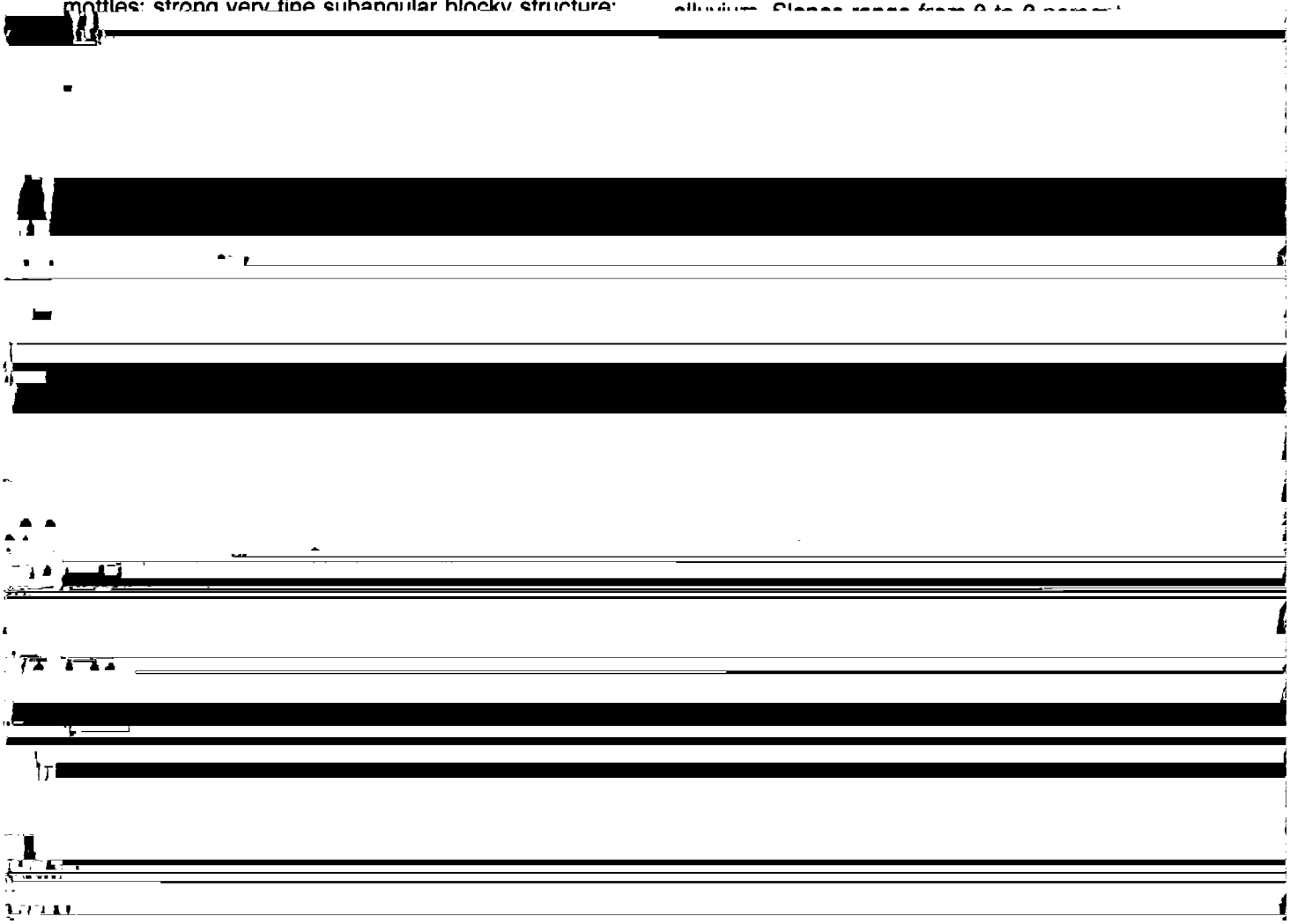
5/8) mottles; massive; friable; few fine concretions (iron and manganese oxides); slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The A horizon is 6 to 10 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. Unless limed, it is slightly acid or medium acid. The E horizon has value of 4 or 5 and chroma of 1 or 2. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is medium acid in the upper part and slightly acid to mildly alkaline in the lower part. It is silty clay loam or silty clay. The content of clay is 35 to 40 percent in the control section. The Cg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

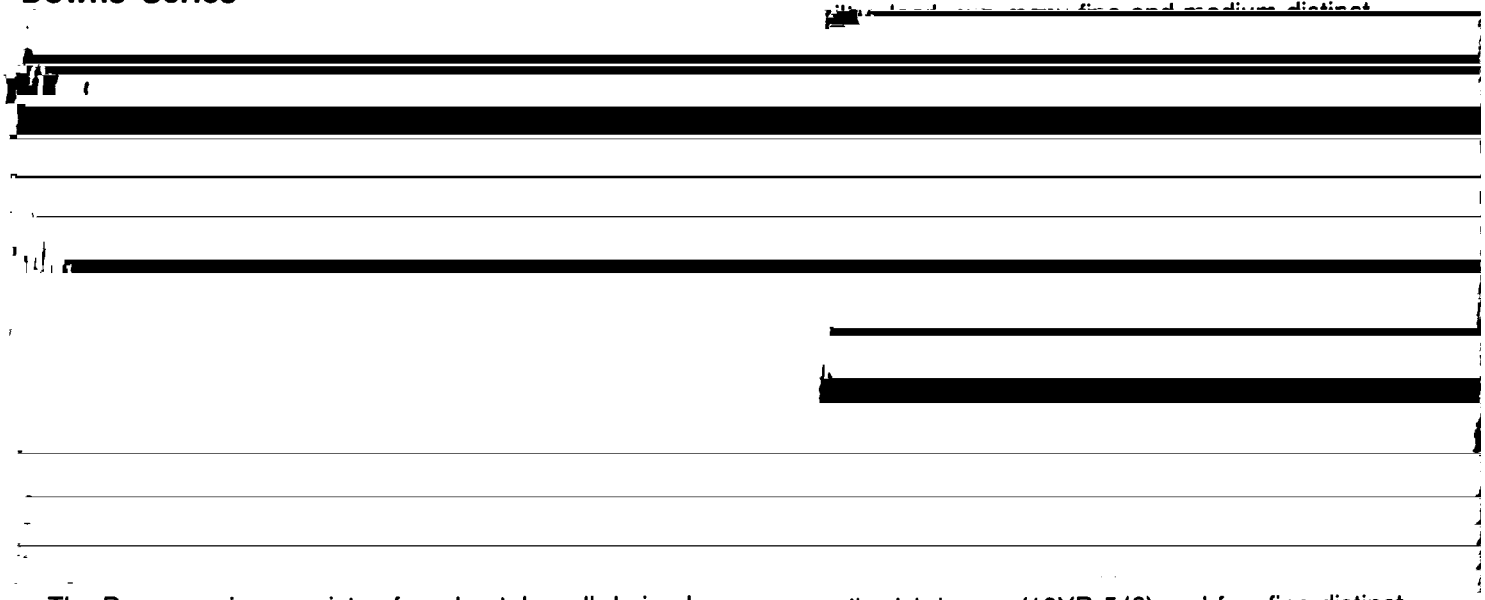
Dorchester Series

The Dorchester series consists of well drained, moderately permeable soils on flood plains and in upland drainageways. These soils formed in silty, calcareous



Downs Series

BC—43 to 60 inches; dark yellowish brown (10YR 4/4)



The Downs series consists of moderately well drained, moderately permeable soils on uplands and stream terraces. These soils formed in loess. Slopes range from 2 to 6 percent.

Downs soils are similar to Elkhart, Rozetta, and Tama soils and commonly are adjacent to Huntsville, Lawson, Rozetta, and Tama soils. Elkhart soils have carbonates within a depth 40 inches. Rozetta and Tama soils are in landscape positions similar to those of the Downs soils. Rozetta soils have a surface layer that is thinner and lighter colored than that of the Downs soils, and Tama soils have one that is thicker or darker. The well drained Huntsville and somewhat poorly drained Lawson soils have a mollic epipedon that is more than 24 inches thick. They are on flood plains below the Downs soils.

Typical pedon of Downs silt loam, 2 to 6 percent slopes, 561 feet east and 693 feet south of northwest corner of sec. 34, T. 13 N., R. 1 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; mixed with some brown (10YR 4/3) E material in the lower part; dominantly weak very fine and fine subangular blocky structure but some weak medium platy structure in the lower 2 inches; friable; slightly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—14 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium angular blocky structure; friable; common distinct dark brown yellowish brown (10YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings lining root channels; common fine stains on faces of peds (iron and manganese oxides); neutral.

The thickness of the solum ranges from 45 to more than 60 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 to 6. It ranges from very strongly acid to medium acid in the most acid part. The clay content ranges from 27 to 35 percent in the control section.

Edinburg Series

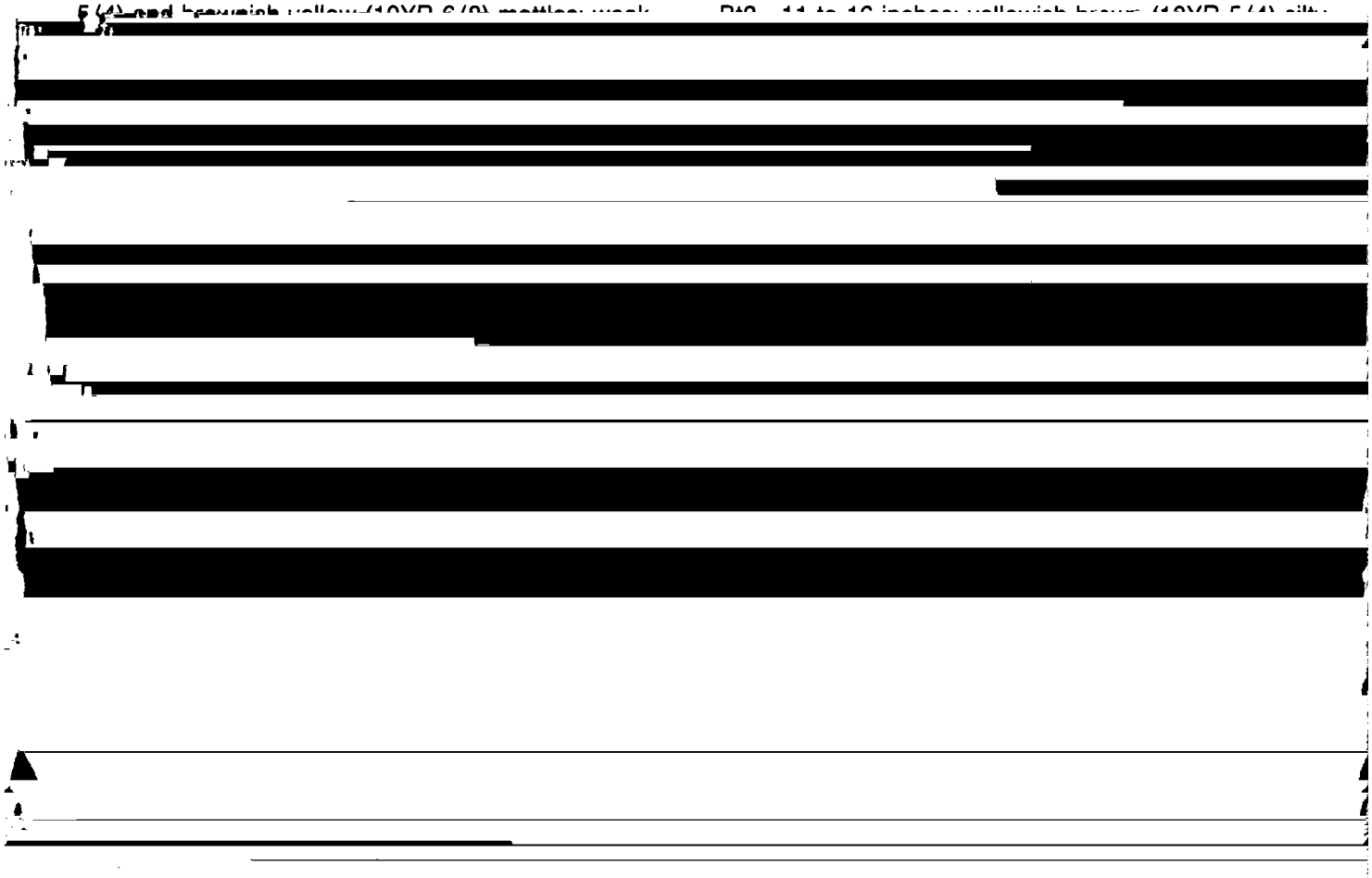
The Edinburg series consists of poorly drained, slowly permeable soils in closed depressions on uplands. These soils formed in loess. Slopes are 0 to 1 percent.

Edinburg soils are similar to Denny and Sable soils and commonly are adjacent to Sable soils. Denny soils have a grayish brown subsurface layer. Sable soils have less clay in the control section than the Edinburg soils. Also, they are higher on the landscape.

Typical pedon of Edinburg silty clay loam, 1,980 feet east and 660 feet south of northwest corner of sec. 36, T. 9 N., R. 3 E.

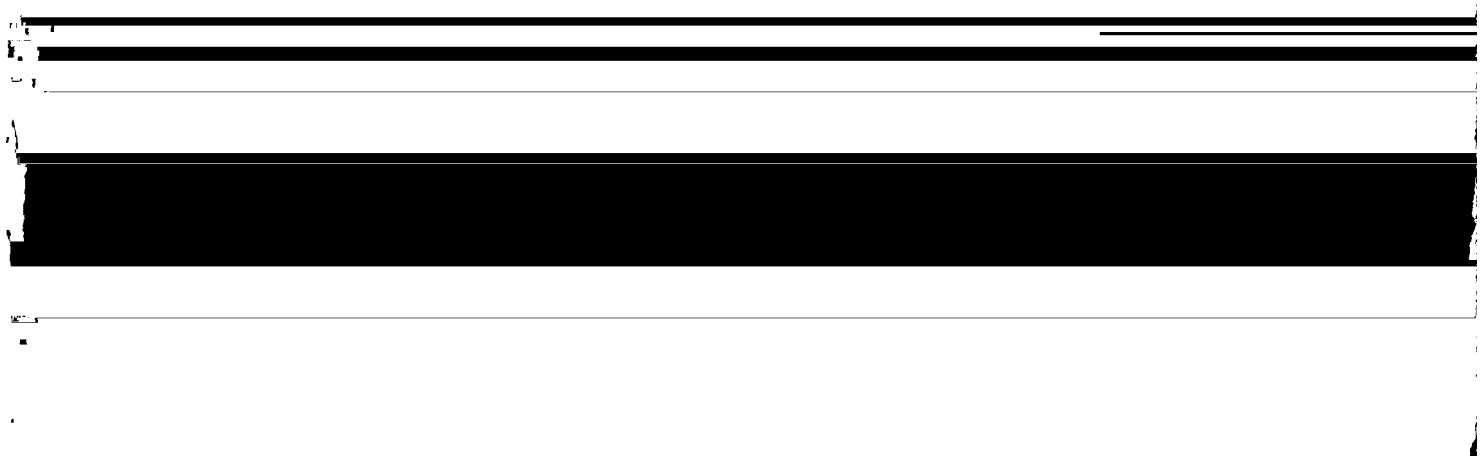
Ap—0 to 6 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; medium fine granular structure; friable; neutral; clear smooth boundary.

A—6 to 16 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate very fine subangular blocky structure; friable; few faint silt



medium prismatic structure; firm; few faint very dark gray (10YR 3/1) clay films lining pores; many medium stains on faces of peds (iron and manganese oxides); neutral; clear smooth boundary.

clay loam; moderate very fine angular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; medium acid; clear smooth boundary.



These soils have a thinner dark surface soil than is definitive for the Elkhart series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Elkhart soils are similar to Downs, Sylvan, and Tama soils and are commonly adjacent to Tama soils. The moderately well drained Downs and Tama soils have carbonates at a depth of more than 36 inches. Tama soils are higher on the landscape than the Elkhart soils. The well drained Sylvan soils have a surface layer that is thinner or lighter colored than that of the Elkhart soils.

Typical pedon of Elkhart silty clay loam, 5 to 10 percent slopes, eroded, 2,244 feet north and 726 feet west of southeast corner of sec. 15, T. 13 N., R. 2 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; medium acid; abrupt smooth boundary.

Bt1—8 to 19 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—19 to 28 inches; yellowish brown (10YR 5/6) silty clay loam; few fine distinct gray (10YR 5/1) mottles; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

BC—28 to 35 inches; yellowish brown (10YR 5/6) silt loam; few fine faint yellowish brown (10YR 5/8) and few fine distinct gray (10YR 5/1) mottles; weak

content in the control section ranges from 10 to 35 percent. The C horizon is mildly alkaline or moderately alkaline.

Fayette Series

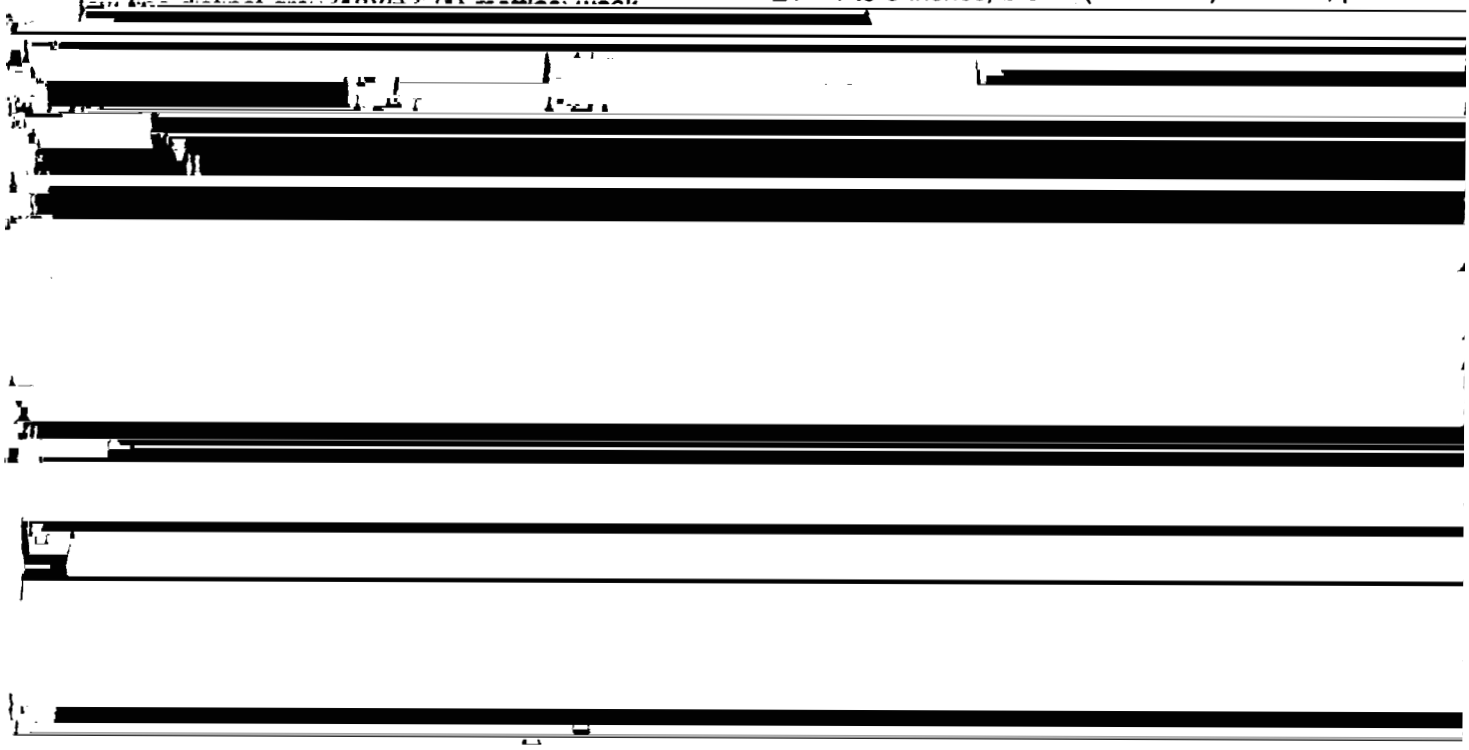
The Fayette series consists of well drained, moderately permeable soils on uplands and stream terraces. These soils formed in loess. Slopes range from 2 to 25 percent.

Fayette soils are similar to Downs, Hickory, Rozetta, and Sylvan soils and commonly are adjacent to Hickory, Rozetta, and Sylvan soils. Downs soils have a surface layer that is thicker or darker than that of the Fayette soils. The well drained Hickory soils formed dominantly in loamy glacial till. They are on slopes below the Fayette soils. Rozetta soils have grayish brown mottles in the lower part of the Bt horizon. They are in landscape positions similar to those of the Fayette soils. The well drained Sylvan soils have carbonates within a depth of 40 inches. They commonly are at the head of drainageways below the Fayette soils.

Typical pedon of Fayette silt loam, 2 to 5 percent slopes, 990 feet south and 924 feet east of northwest corner of sec. 18, T. 9 N., R. 3 E.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; slightly acid; clear smooth boundary.

E1—4 to 8 inches; brown (10YR 4/3) silt loam, pale



films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); very strongly acid; gradual smooth boundary.

Bt3—37 to 50 inches; yellowish brown (10YR 5/4) silty clay loam; many medium faint yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; common distinct dark yellowish brown (10YR 4/4) clay films and few distinct dark grayish brown (10YR 4/2) silt coatings on faces of peds; few fine stains on faces of peds (iron and manganese oxides); very strongly acid; gradual smooth boundary.

BC—50 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; common faint dark yellowish brown (10YR 4/4) clay films lining channels and pores; few distinct light gray (10YR 7/2) silt coatings on faces of peds; few fine stains on faces of peds (iron and manganese oxides); strongly acid.

The thickness of the solum ranges from 36 to 60 inches. The A horizon has value of 2 or 3 and chroma of 1 or 2. The Ap horizon, if it occurs, has hue of 10YR, value of 4, and chroma of 2 or 3. The E horizon has value of 4 or 5 and chroma of 1 to 4. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. Some pedons have a C horizon.

Harvard Series

The Harvard series consists of well drained, [illegible]

coatings lining pores; slightly acid; clear smooth boundary.

Bt2—14 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—22 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common thin brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

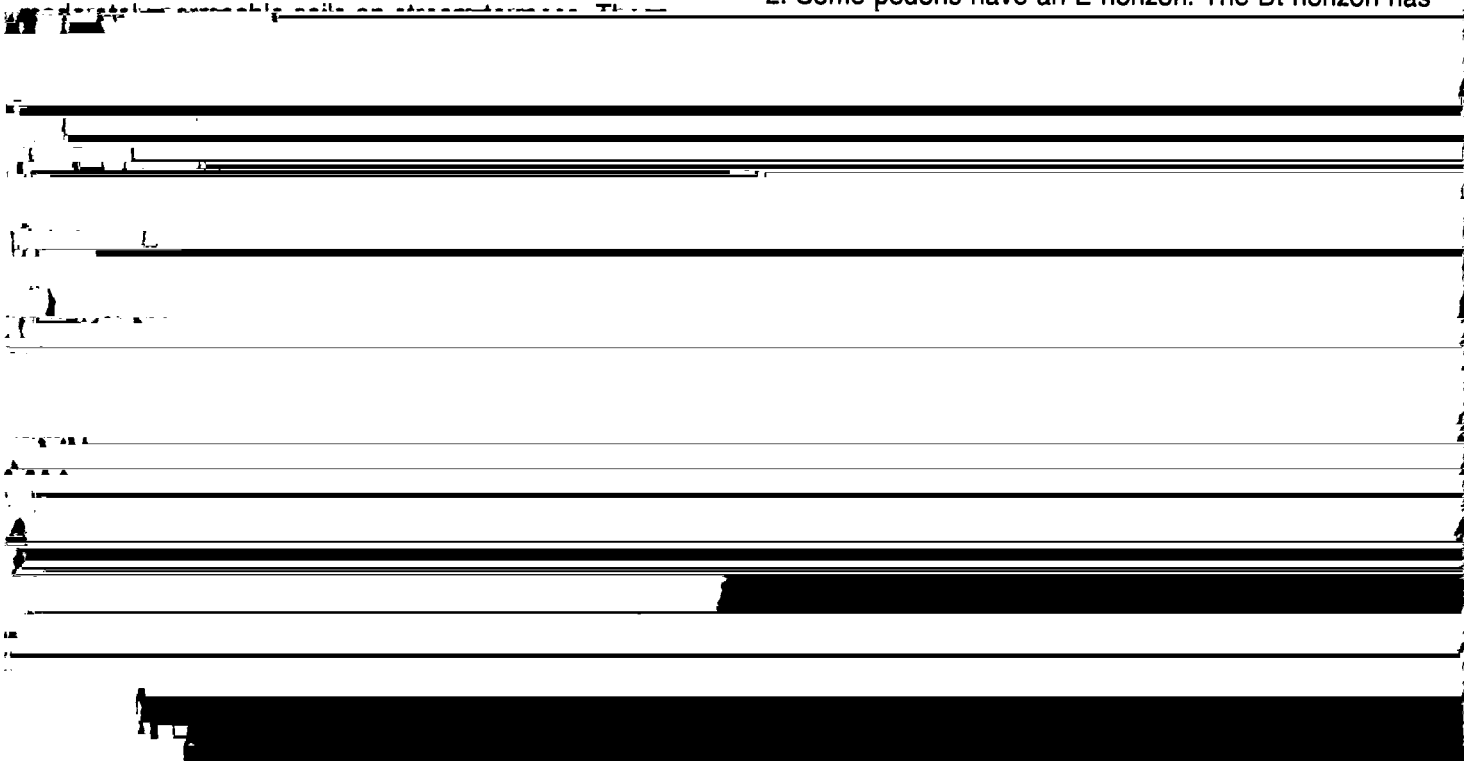
Bt4—32 to 37 inches; yellowish brown (10YR 5/4) silt loam; weak coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

2Bt5—37 to 45 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; abrupt smooth boundary.

2C—45 to 60 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) stratified loam, sandy loam, and loamy sand; massive; very friable; slightly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The thickness of the loess layer ranges from 20 to 40 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. Some pedons have an E horizon. The Bt horizon has



Typical pedon of Hickory loam, 30 to 50 percent slopes, 2,442 feet south and 627 feet west of the northeast corner of sec. 34, T. 12 N., R. 4 E.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.
E—4 to 9 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; common medium faint very dark grayish brown (10YR 3/2) mottles; weak thin platy structure parting to weak medium subangular blocky; friable; strongly acid; clear smooth boundary.
Bt1—9 to 17 inches; brown (10YR 4/3) loam; weak fine and very fine subangular blocky structure; friable; common distinct dark brown (10YR 3/3) clay films on faces of peds; strongly acid; clear smooth boundary.
Bt2—17 to 24 inches; dark yellowish brown (10YR 4/4) clay loam; few fine faint yellowish brown (10YR 5/6) mottles; strong medium angular blocky structure; firm; many distinct dark brown (10YR 3/3) clay films on faces of peds; few limestone pebbles; medium acid; clear smooth boundary.
Bt3—24 to 32 inches; dark yellowish brown (10YR 4/4) clay loam; few fine faint yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; few limestone pebbles; strongly acid; clear smooth boundary.
Bt4—32 to 40 inches; dark yellowish brown (10YR 4/4) clay loam; few fine faint yellowish brown (10YR 5/6) mottles; weak medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; common chert and limestone pebbles;

loam. The clay content in the control section ranges from 25 to 35 percent and the sand content from 15 to 45 percent. The C horizon has hue of 10YR or 2.5Y, value of 5, and chroma of 2 to 4. It is clay loam, loam, or sandy loam.

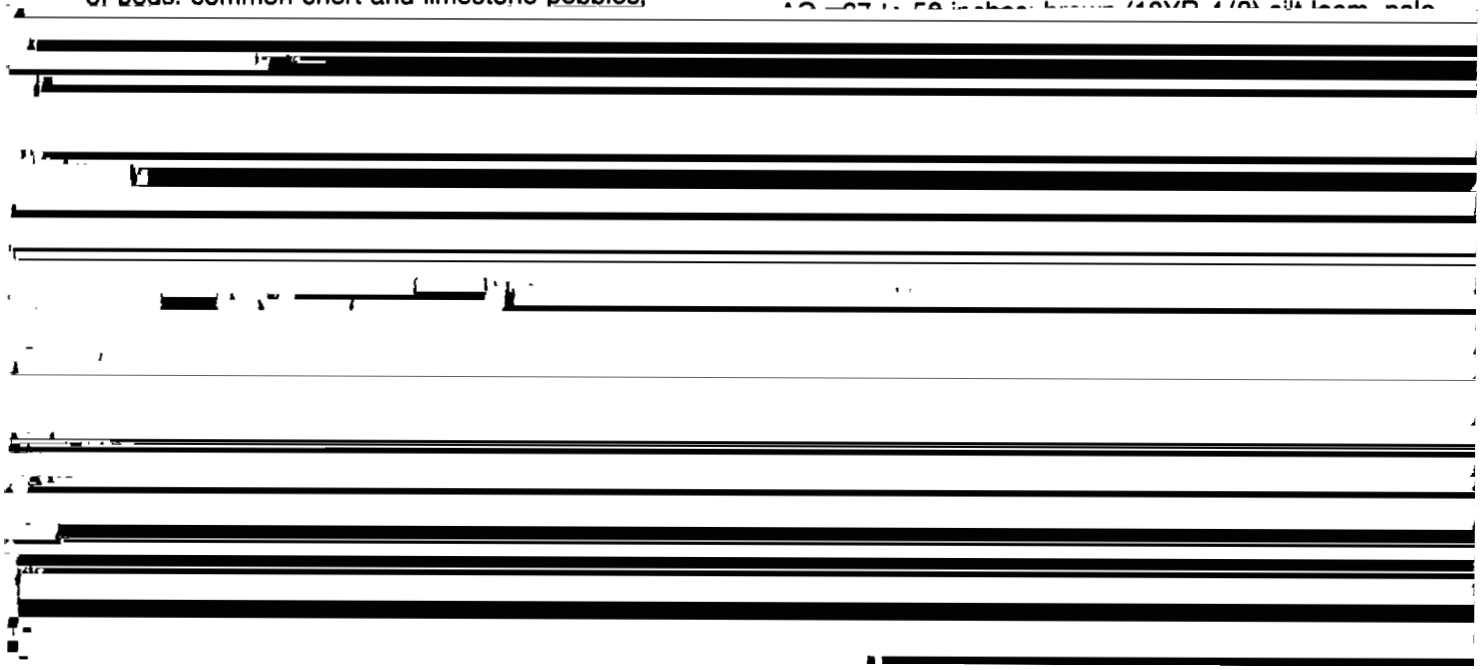
Huntsville Series

The Huntsville series consists of well drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Huntsville soils commonly are adjacent to Lawson and Sawmill soils. The adjacent soils are lower on the landscape than the Huntsville soils. Lawson soils are somewhat poorly drained. Sawmill soils are poorly drained.

Typical pedon of Huntsville silt loam, 2,475 feet east and 495 feet south of northwest corner of sec. 1, T. 12 N., R. 4 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; slightly acid; clear smooth boundary.
A1—10 to 16 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.
A2—16 to 27 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.



Ipava soils are similar to Clarksdale and Tama soils and commonly are adjacent to Sable and Tama soils. Clarksdale soils do not have a mollic epipedon. Sable soils have less clay in the control section than the Ipava soils. They are subject to ponding, are poorly drained, and are on the lower parts of the uplands. Tama soils have less clay in the control section than the Ipava soils. They are moderately well drained and are in the more sloping areas on the higher parts of the landscape.

Typical pedon of Ipava silt loam, 0 to 3 percent slopes, 2,046 feet west and 594 feet north of the southeast corner of sec. 25, T. 13 N., R. 2 E.

Ap—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; medium acid; abrupt smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common thin black (10YR 2/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

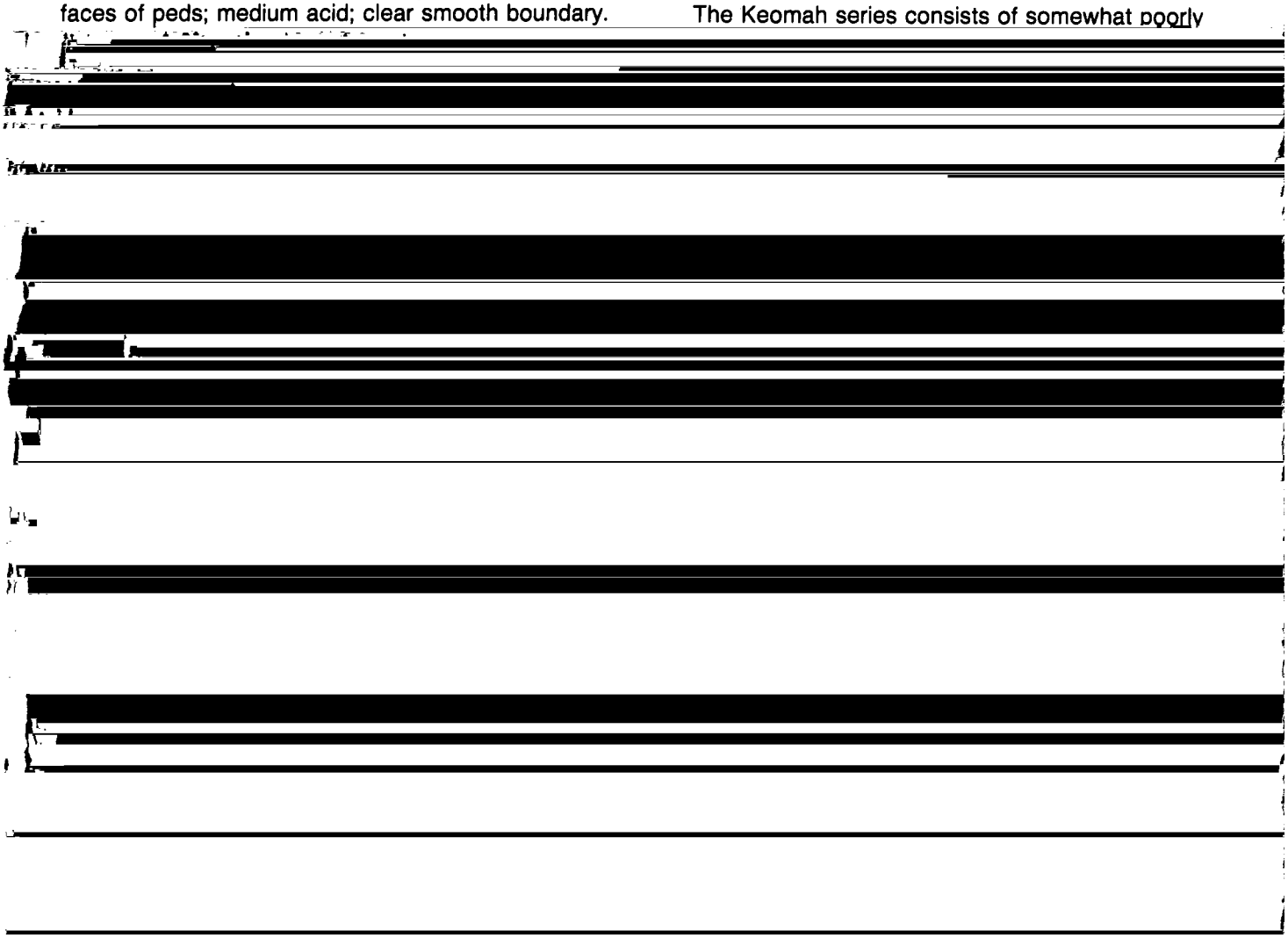
Cg—50 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; massive; friable; few faint very dark grayish brown (10YR 3/2) clay films lining pores; few fine concretions and few fine stains along vertical cracks (iron and manganese oxides); moderately alkaline.

The thickness of the solum ranges from 45 to more than 60 inches. The thickness of the mollic epipedon ranges from 14 to 24 inches.

The Ap and A horizons have value of 2 or 3 and chroma of 1 or 2. They range from medium acid to neutral. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is silty clay loam or silty clay. It has a clay content of 35 to 43 percent in the control section. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 4.

Keomah Series

The Keomah series consists of somewhat poorly



peds (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—14 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); medium acid; clear smooth boundary.

Btg1—17 to 26 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine prominent yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to strong medium angular blocky; firm; many distinct thick grayish brown (2.5Y 5/2) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); medium acid; clear smooth boundary.

Btg2—26 to 38 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine and medium prominent strong brown (7.5YR 5/8) and common fine faint brown (10YR 4/3) mottles; weak medium prismatic structure parting to weak medium angular blocky; firm; many distinct grayish brown (10YR 5/2) clay

in upland drainageways. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Lawson soils are similar to Radford and Sawmill soils and commonly are adjacent to Huntsville and Sawmill soils. Huntsville soils are well drained and are slightly higher on the landscape and nearer the streams than the Lawson soils. Radford soils have a dark colored buried soil within a depth of 40 inches. Sawmill soils are poorly drained and are lower on the landscape than the Lawson soils.

Typical pedon of Lawson silt loam, 825 feet west and 1,320 feet south of the northeast corner of sec. 8, T. 9 N., R. 3 E.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; mildly alkaline; clear smooth boundary.

A1—12 to 21 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak

Lenzburg Series

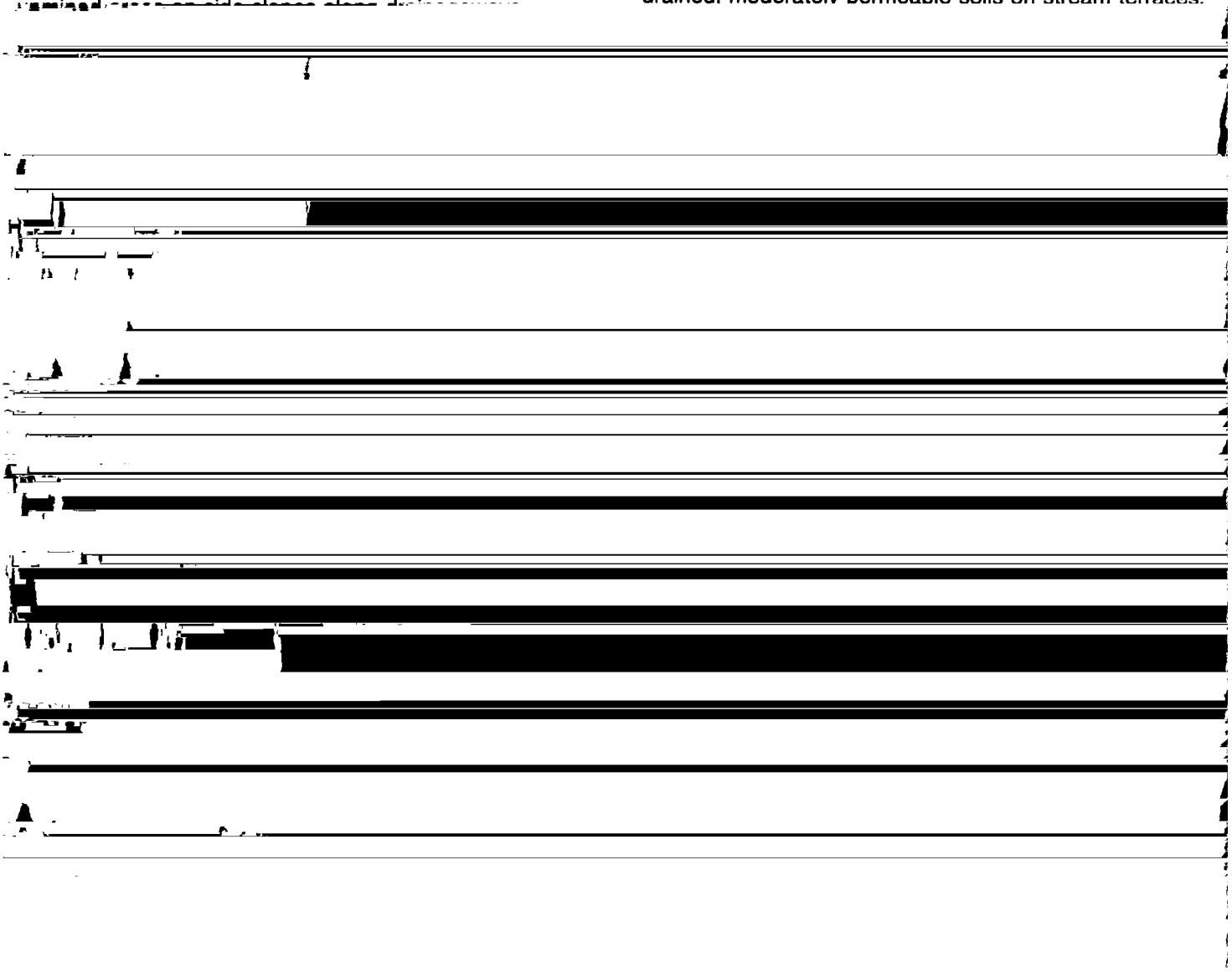
The Lenzburg series consists of well drained, moderately slowly permeable soils formed in a regolith in surface-mined areas on uplands. The regolith is a mixture of fine-earth material and fragments of bedrock. Slopes range from 1 to 70 percent.

Lenzburg soils are similar to Rapatee soils and commonly are adjacent to Atlas, Elco, Hickory, and Marseilles soils. Rapatee soils are fine-silty and have a moist value of 2 or 3 in the upper 10 to 30 inches. Atlas and Elco soils formed in loess and in the underlying loamy glacial till, which has a strongly developed paleosol. They are more poorly drained than the Lenzburg soils. The well drained Hickory soils formed dominantly in loamy glacial till. The well drained Marseilles soils formed dominantly in material weathered from shale and siltstone. All the adjacent soils are in

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 to 4. It ranges from neutral to moderately alkaline. It is channery loam, loam, clay loam, silt loam, or silty clay loam. The content of rock fragments in this horizon ranges from 10 to 25 percent by volume. A few stones are on the surface. The C horizon has hue of 10YR, 2.5Y, 5Y, or 5G or is neutral in hue. It has value of 2 to 6 and chroma of 0 to 6. Many of the colors are relict and are not indicative of soil drainage. The C horizon is loam, clay loam, silt loam, silty clay loam, silty clay, or the channery or gravelly analogs of these textures. The content of rock fragments in this horizon ranges from 15 to 35 percent by volume.

Littleton Series

The Littleton series consists of somewhat poorly drained, moderately permeable soils on stream terraces.



faint grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; few fine concretions (iron and manganese oxides); mildly alkaline.

The solum ranges from 40 to 50 inches in thickness. It is slightly acid to mildly alkaline. The thickness of the mollic epipedon ranges from 24 to 40 inches.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The B horizon has value of 3 to 5 and chroma of 2 or 3. The clay content in the control section ranges from 18 to 24 percent. The C horizon has value of 4 to 6 and chroma of 1 to 3.

Marseilles Series

The Marseilles series consists of well drained, slowly permeable soils on upland side slopes. These soils are moderately deep over bedrock. They formed in material weathered from shale and siltstone. Slopes range from 10 to 60 percent.

Marseilles soils commonly are adjacent to Atlas, Elco, Fayette, and Hickory soils. The somewhat poorly drained [redacted]

gray (2.5Y 6/2) shale and siltstone channers; very strongly acid; gradual smooth boundary.

Bt3—22 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; common medium faint yellowish brown (10YR 5/6) mottles; weak medium angular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; common light brownish gray (2.5Y 6/2) shale and siltstone channers; very strongly acid; gradual smooth boundary.

BC—27 to 34 inches; olive (5Y 5/3) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak medium platy structure; very firm; many light brownish gray (2.5Y 6/2) shale and siltstone channers; very strongly acid; clear smooth boundary.

Cr—34 to 60 inches; olive (5Y 5/3) and light brownish gray (2.5Y 6/2) shale and siltstone; few fine and medium prominent yellowish brown (10YR 5/4) mottles; weak thick platy rock structure; extremely firm; strongly acid.

The thickness of the solum ranges from 20 to 40 inches. It commonly is the same as the depth to bedrock.

The A horizon has value of 3 or 4 and chroma of 2 or

[redacted]

medium subangular blocky structure parting to moderate fine granular; friable; mildly alkaline; clear smooth boundary.

C1—5 to 17 inches; dark brown (10YR 4/3) silt loam; [illegible]

[illegible]

mottles; weak fine subangular blocky structure; friable; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; strata of light gray (10YR 7/2) silt in the lower part; mildly alkaline; gradual smooth boundary.

C2—17 to 29 inches; brown (10YR 5/3) silt loam; few fine faint light brownish gray (10YR 6/2) mottles; weak very fine subangular blocky structure; friable; thin strata of very dark gray (10YR 3/1) organic matter in the lower part; mildly alkaline; abrupt smooth boundary.

Ab1—29 to 42 inches; very dark gray (10YR 3/1) silty clay loam; common fine faint dark brown (10YR 4/3) mottles; moderate medium granular structure; friable; mildly alkaline; clear smooth boundary.

Ab2—42 to 57 inches; very dark gray (10YR 3/1) silty clay loam; few fine prominent dark brown (7.5YR 4/4) mottles; moderate fine and medium angular blocky structure; firm; few fine stains on faces of peds (iron and manganese oxides); neutral; clear smooth boundary.

C —57 to 60 inches; dark gray (10YR 4/1) silt loam; common fine prominent dark brown (7.5YR 4/4) mottles; weak medium prismatic structure; firm; few fine stains on faces of peds (iron and manganese oxides); slightly acid.

The depth to the Ab horizon ranges from 20 to 40 inches. The Ap horizon and the upper C horizon have value of 4 or 5 and chroma of 2 or 3. The clay content in the control section ranges from 18 to 26 percent. The [illegible]

are slightly lower on the landscape than the Radford soils.

Typical pedon of Radford silt loam, 1,617 feet west and 132 feet north of southeast corner of sec. 17, T. 13 [illegible]

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak medium subangular blocky structure; friable; slightly acid; clear smooth boundary.

A—9 to 20 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to weak fine and medium granular; friable; few faint black (10YR 2/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

C—20 to 26 inches; very dark gray (10YR 3/1) silt loam; thin yellowish brown (10YR 5/4) strata; thick strata with weak fine and medium granular structure; friable; slightly acid; abrupt smooth boundary.

Ab1—26 to 31 inches; black (10YR 2/1) silty clay loam; weak fine subangular blocky structure parting to weak fine and medium granular; friable; mildly alkaline; clear smooth boundary.

Ab2—31 to 47 inches; black (10YR 2/1) silty clay loam; weak coarse prismatic structure parting to weak medium angular blocky; firm; few fine threadlike stains (iron and manganese oxides); mildly alkaline; clear smooth boundary.

Ab3—47 to 60 inches; black (10YR 2/1) silty clay loam; few fine distinct yellowish brown (10YR 5/4) mottles; weak medium angular blocky structure; firm; mildly alkaline.

The mollic epipedon ranges from 10 to 24 inches in thickness. The depth to the buried soil ranges from 20 [illegible]

soils, formed in loess, and are in undisturbed areas.

Typical pedon of Rapatee silty clay loam, 1 to 7 percent slopes, 1,460 feet west and 2,300 feet north of the southeast corner of sec. 11, T. 12 N., R. 3 E.

Ap—0 to 3 inches; mixed black (10YR 2/1) and very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1), and gray (10YR 5/1) dry; moderate very

horizon is loam, clay loam, silt loam, silty clay loam, or the channery analogs of these textures. The content of rock fragments in this horizon ranges from 10 to 30 percent by volume. The rock fragments are commonly soft shale and siltstone, but some are sandstone and limestone. The clay content in the control section ranges from 22 to 35 percent. In some pedons the C2 and 2C

common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine

Btg1—21 to 28 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct yellowish brown

concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt5—40 to 53 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium distinct light brownish gray (10YR 6/2) and common fine faint yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few

(10YR 5/4) mottles; weak medium prismatic structure parting to moderate fine subangular blocky; friable; many distinct very dark gray (10YR 3/1) clay films on faces of peds; neutral; clear smooth boundary.

Btg2—28 to 36 inches; gray (5Y 5/1) silty clay loam; few fine prominent brown (10YR 5/3) and yellowish

Typical pedon of Sawmill silty clay loam, overwash, 2,640 feet west and 30 feet north of the southeast corner of sec. 14, T. 10 N., R. 3 E.

Ap—0 to 13 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; some thin brown (10YR 5/3) strata; weak medium subangular blocky structure; firm; mildly alkaline; gradual smooth boundary.

A1—13 to 25 inches; very dark gray (N 3/0) silty clay loam, dark gray (N 4/0) dry; weak medium subangular blocky structure; firm; few fine stains on faces of peds (iron and manganese oxides); neutral; gradual smooth boundary.

A2—25 to 33 inches; very dark gray (N 3/0) silty clay loam, dark gray (N 4/0) dry; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; neutral; gradual smooth boundary.

AB—33 to 38 inches; black (5Y 2/1) silty clay loam, dark gray (5Y 4/1) dry; few fine prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; few fine stains on faces of peds (iron and manganese oxides); neutral; abrupt smooth boundary.

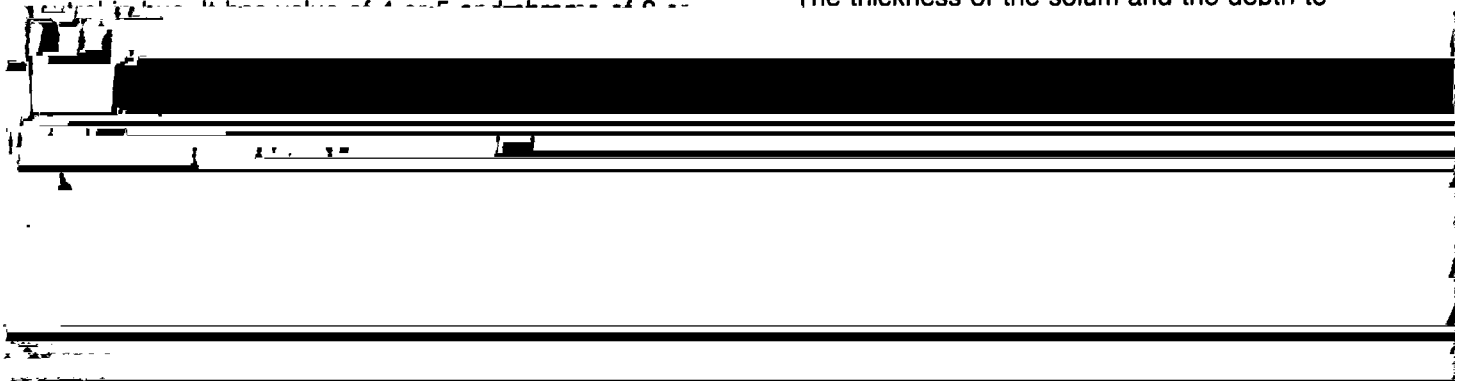
Bg1—38 to 46 inches; dark gray (N 4/0) silty clay loam; many fine and medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; firm; neutral; abrupt smooth boundary.

Bg2—46 to 54 inches; dark gray (N 4/0) silty clay loam; common fine and medium prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; mildly alkaline; gradual smooth boundary.

Cg—54 to 60 inches; gray (N 5/0) silty clay loam; few fine distinct yellowish brown (10YR 5/4) mottles; massive; friable; mildly alkaline.

The solum ranges from 36 to 60 inches in thickness. It is slightly acid to moderately alkaline. The overwash material is 10 to 18 inches thick. The mollic epipedon is 24 to 36 inches thick.

The A horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 or 1. The Bg horizon has hue of 10YR, 2.5Y or 5Y or is



thicker or darker than that of the Sylvan soils. Fayette soils and the moderately well drained Rozetta soils have carbonates at a depth of more than 40 inches. They are in landscape positions similar to those of the Sylvan soils.

Typical pedon of Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded, 467 feet east and 99 feet north of the southwest corner of sec. 35, T. 12 N., R. 3 E.

Ap—0 to 8 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; medium acid; clear smooth boundary.

Bt1—8 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine angular blocky structure; friable; common faint brown (10YR 4/3) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); medium acid; clear smooth boundary.

Bt2—13 to 27 inches; brown (10YR 5/3) silty clay loam; many medium and coarse faint light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); slight effervescence; mildly alkaline; clear smooth boundary.

C1—27 to 40 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; common fine concretions (iron and manganese oxides); few medium concretions (calcium carbonate); slight effervescence; moderately alkaline; clear smooth boundary.

C2—40 to 60 inches; mottled light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) silt loam; massive; friable; few fine stains on faces of vertical cracks (iron and manganese oxides); few fine concretions (calcium carbonate); strong effervescence; moderately alkaline.

The thickness of the solum and the depth to

terraces. These soils formed in loess. Slopes range from 1 to 15 percent.

Tama soils are similar to Assumption, Downs, Elkhart, and Rozetta soils and commonly are adjacent to Assumption, Downs, and Elkhart soils. Assumption soils formed in loess and in the underlying glacial till. They are downslope from the Tama soils. Downs and Rozetta soils have a surface layer that is thinner or lighter colored than that of the Tama soils. Also, they are nearer drainageways and streams. The well drained Elkhart soils have carbonates within a depth of 40 inches. They are at the head of drainageways.

Typical pedon of Tama silt loam, 1 to 4 percent slopes, 165 feet east and 1,221 feet south of northwest corner of sec. 14, T. 13 N., R. 2 E.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate very fine and fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

A—9 to 13 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine subangular blocky structure; friable; medium acid; clear smooth boundary.

Bt1—13 to 20 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common distinct very dark gray (10YR 3/1) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—20 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few distinct black (10YR 2/1) organic films lining root channels; medium acid; clear smooth boundary.

Bt3—31 to 41 inches; yellowish brown (10YR 5/4) silty clay loam; few fine and medium faint yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; friable; common faint brown (10YR 4/3) clay films on faces of peds; few fine stains on faces of peds (iron and manganese oxides); neutral; clear smooth boundary.

BC—41 to 47 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/8) mottles; weak fine prismatic structure; friable; few distinct very dark grayish brown (10YR 3/2) organic films lining root channels; few fine stains on faces of peds (iron and manganese oxides); neutral; clear smooth boundary.

C—47 to 60 inches; yellowish brown (10YR 5/6) silt loam; many fine and medium distinct gray (10YR 5/1), common fine faint yellowish brown (10YR 5/4), and common fine distinct strong brown (7.5YR 5/8) mottles; massive; friable; few fine stains on faces of vertical cracks (iron and manganese oxides); moderately alkaline.

The solum ranges from 40 to more than 60 inches in thickness. The mollic epipedon ranges from 10 to 20 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. The clay content in the control section ranges from 27 to 35 percent. The C horizon has value of 4 or 5 and chroma of 3 to 6.

Tama silty clay loam, 2 to 5 percent slopes, eroded, Tama silty clay loam, 5 to 10 percent slopes, eroded, Tama silty clay loam, 10 to 15 percent slopes, eroded, and the Tama soil in the Tama-Urban land complex, 3 to 10 percent slopes, have a dark surface soil that is thinner than is definitive for the Tama series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Virgil Series

The Virgil series consists of somewhat poorly drained, moderately permeable soils on stream terraces. These soils formed in loess and in the underlying stratified loamy outwash. Slopes range from 0 to 2 percent.

Virgil soils are similar to Clarksdale and Keomah soils and commonly are adjacent to Camden, Harvard, and Sawmill soils. Clarksdale and Keomah soils formed entirely in loess and have more clay in the control section than the Virgil soils. Camden and Harvard soils are moderately well drained and well drained, are shallower to loamy sediments than the Virgil soils, and are on the higher, more sloping parts of the landscape. Sawmill soils are poorly drained, formed in alluvium, and are lower on the landscape than the Virgil soils.

Typical pedon of Virgil silt loam, 1,100 feet west and 1,640 feet south of the northeast corner of sec. 12, T. 10 N., R. 3 E.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; very few fine roots; slightly acid; clear smooth boundary.

E—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure parting to moderate medium granular; friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining pores; very few very fine roots; slightly acid; clear smooth boundary.

Bt1—13 to 19 inches; brown (10YR 4/3) silt loam; many fine faint dark grayish brown (10YR 4/2) and few medium faint yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine

concretions (iron and manganese oxides); very few very fine roots; slightly acid; gradual smooth boundary.

Bt2—19 to 38 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/4) and few fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine concretions (iron and manganese oxides); very few very fine roots; medium acid; clear smooth boundary.

Bt3—38 to 47 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct grayish brown (10YR 5/2) mottles; weak coarse angular blocky structure; friable; few thin dark grayish brown (10YR 4/2) clay films on faces of peds; common fine stains on faces of peds; few fine concretions (iron and manganese oxides); medium acid; clear smooth boundary.

2Bt4—47 to 55 inches; dark yellowish brown (10YR 4/4) loam; common fine and medium distinct grayish brown (10YR 5/2) and many fine and medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; friable; few faint gray (10YR 5/1) clay films lining root channels; common fine stains on faces of peds; common fine concretions (iron and manganese oxides); medium acid; clear smooth boundary.

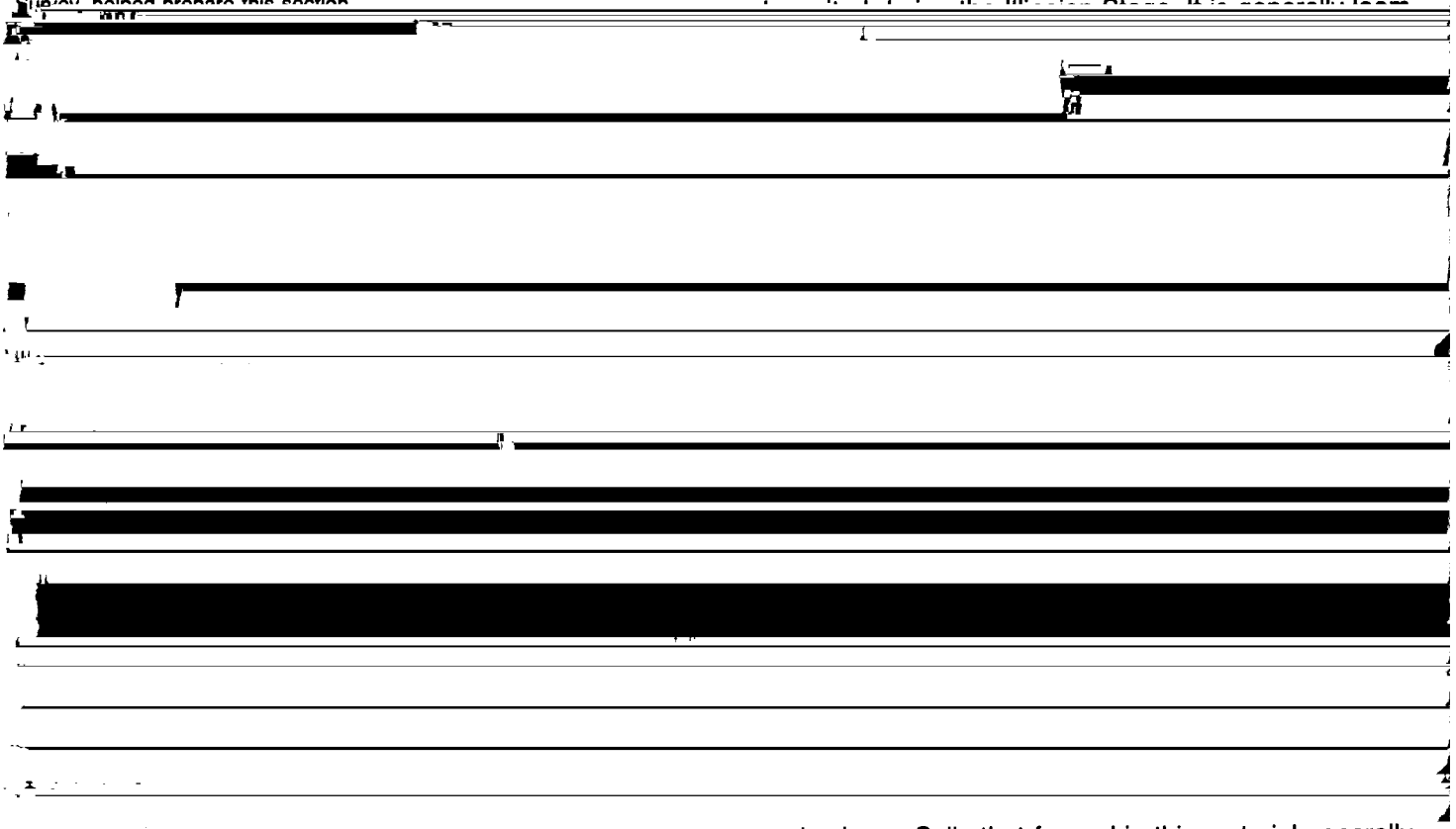
2C—55 to 60 inches; dark yellowish brown (10YR 4/4) stratified silt loam, loam, and clay loam; common medium distinct grayish brown (10YR 5/2) mottles; massive; friable; common fine stains on faces of peds; few fine concretions (iron and manganese oxides); slightly acid.

The solum ranges from 42 to more than 60 inches in thickness. It is strongly acid to neutral. The loess layer ranges from 40 to 60 inches in thickness.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The clay content in the control section ranges from 27 to 35 percent. The 2B horizon is loam, silt loam, or clay loam. The 2C horizon is stratified silt loam, loam, clay loam, and sandy loam.

Formation of the Soils

Dr. Leon Follmer, associate geologist, Illinois State Geological Survey, helped prepare this section.



Soil forms through processes that act on deposited or accumulated geologic material. The soil characteristics at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil formed; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the parent material.

Climate and plant and animal life are the active factors of soil formation. They act directly on the parent material either in place or after relocation by water, glaciers, or wind and slowly change it into a natural body that has

washing by water. The glacial till in Knox County was [illegible] It is generally loam or clay loam. Soils that formed in this material generally are on strongly sloping to very steep side slopes. An example is Hickory soils.

In some areas a very firm layer higher in content of clay is in the upper few feet of the Illinoian till. This is a paleosol, which formed during the Sangamonian Stage, between the Illinoian and Wisconsinan Stages (*15*). During the Sangamonian Stage, the glacial till was the surface deposit. It was subject to soil-forming processes. During the Wisconsinan Stage, these soils were buried by loess deposits. Atlas and Assumption are examples of soils that formed in a thin layer of loess and in the

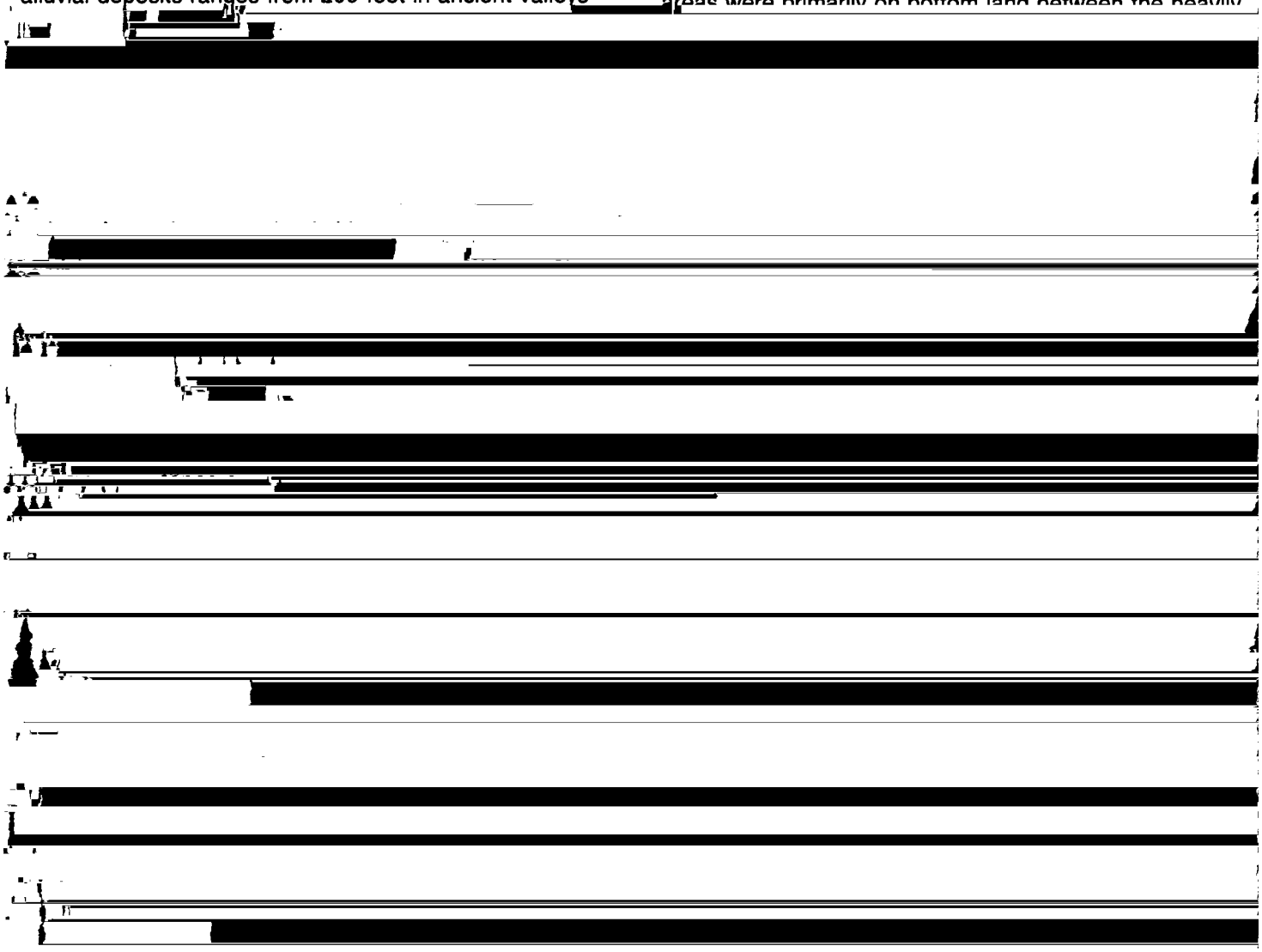
an example of soils that formed in sandy windblown material.

Alluvial sediments were deposited mainly during periods of stream overflow. They generally have a silty texture, which indicates that uplands were the source of the sediments. The alluvial areas are throughout the county. Their width ranges for 1 1/2 miles along the Spoon River to less than 1/8 mile along the minor streams. In some areas the sediments have buried horizons of darker soil material.

Pennsylvanian shale, sandstone, and siltstone underlie most of the unconsolidated deposits throughout the county (*7*). The thickness of the overlying glacial and alluvial deposits ranges from 200 feet in ancient valleys

About 33 percent of the county supported timber vegetation at the time of early settlement. These deciduous hardwood forests contributed organic matter to the soil mainly as leaf litter. Their root systems were less fibrous than those of grasses and generally were not densely concentrated near the surface. Therefore, these soils have a surface soil that is thinner and lighter colored than that of the soils that formed under prairie grasses. In general, they are on narrow upland divides between streams or on the side slopes bordering stream valleys.

The native vegetation in about 10 percent of the county was mixed prairie grasses and timber. These areas were primarily on bottom land between the heavily



Nearly level, poorly drained soils, such as Sable soils,

References

(1) American Association of State Highway and Transportation Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vols., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Coffey, George N., and others. 1904. Soil survey of Knox County, Illinois. U.S. Dep. Agric., Bur. of Soils, 20 pp., illus.

(4) Fehrenbacher, J.B., I.J. Jansen, B.W. Ray, J.D. Alexander, and T.S. Harris. 1977. Soil associations of Knox County, Illinois. Univ. of Ill., Coll. of Agric., Spec. Publ. 46, 27 pp., illus.

(5) Fehrenbacher, J.B., R.A. Pope, I.J. Jansen, J.D. Alexander, and B.W. Ray. 1978. Soil productivity in Illinois. Univ. of Ill., Coll. of Agric., Coop. Ext. Serv., Circ. 1156, 21 pp., illus.

(8) Russell, Kenneth. 1968. Knox County surface water resources. Ill. Dep. of Conserv., Div. of Fish., 55 pp.

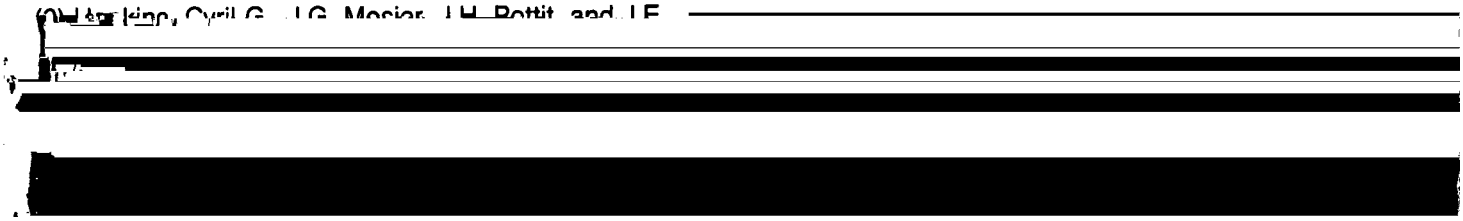
(9) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(10) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210, 21 pp.

(11) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(12) United States Department of Commerce, Bureau of the Census. 1980. 1978 census of agriculture, preliminary report—Knox County, Illinois. 4 pp.

(13) Wascher, H.L., and others. 1971. Loess soils of northwest Illinois. Univ. of Ill., Agric. Exp. Stn. Bull. 739, 112 pp., illus.



Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

[redacted]

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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

[redacted]

diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected

the soil profile between depths of 10 inches and 40 or 80 inches.

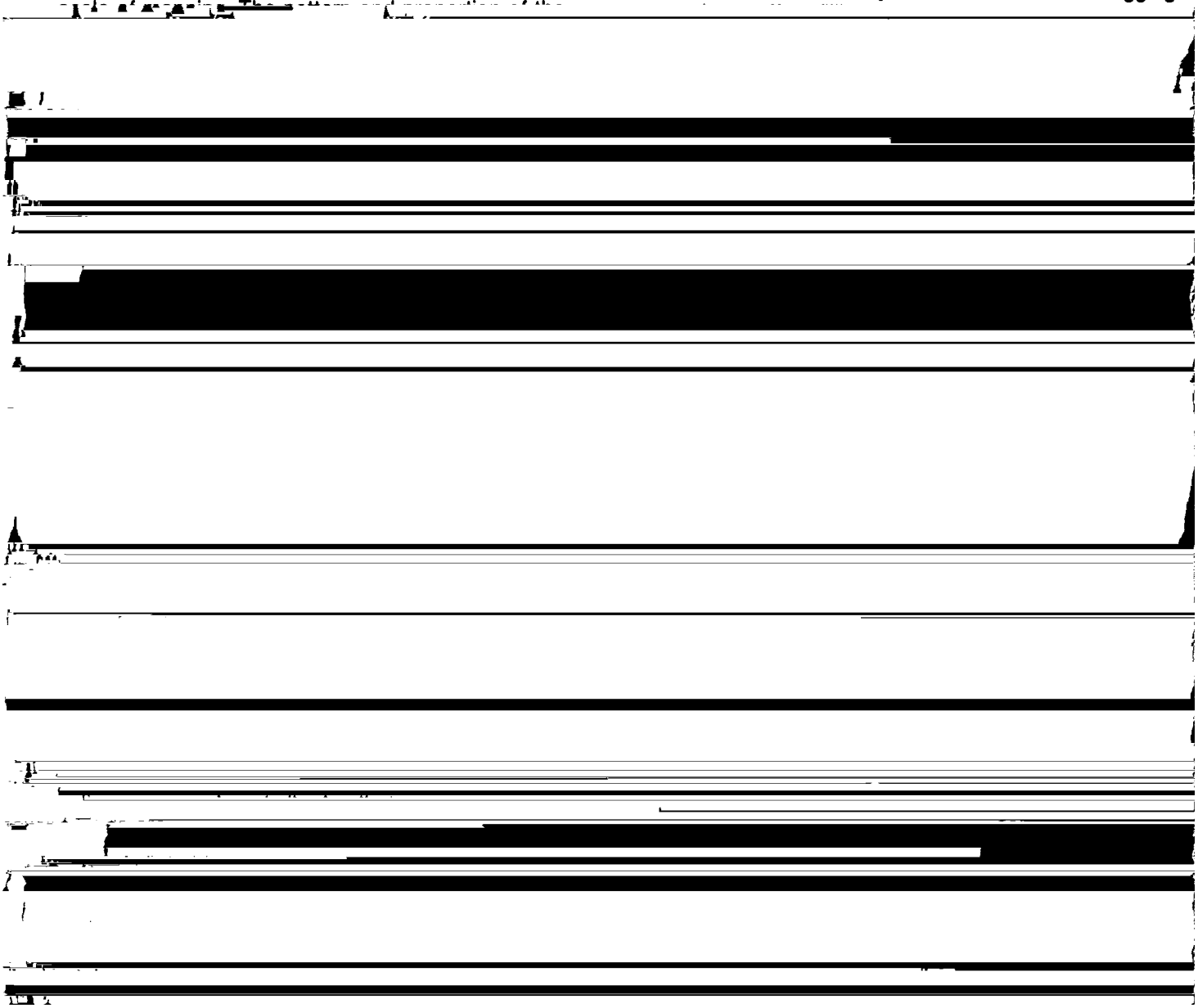
Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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.

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



Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly

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

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow

and coal in a surface mine or the face or bank on the uphill side of a contour strip mine excavation.

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. The major horizons are as follows:

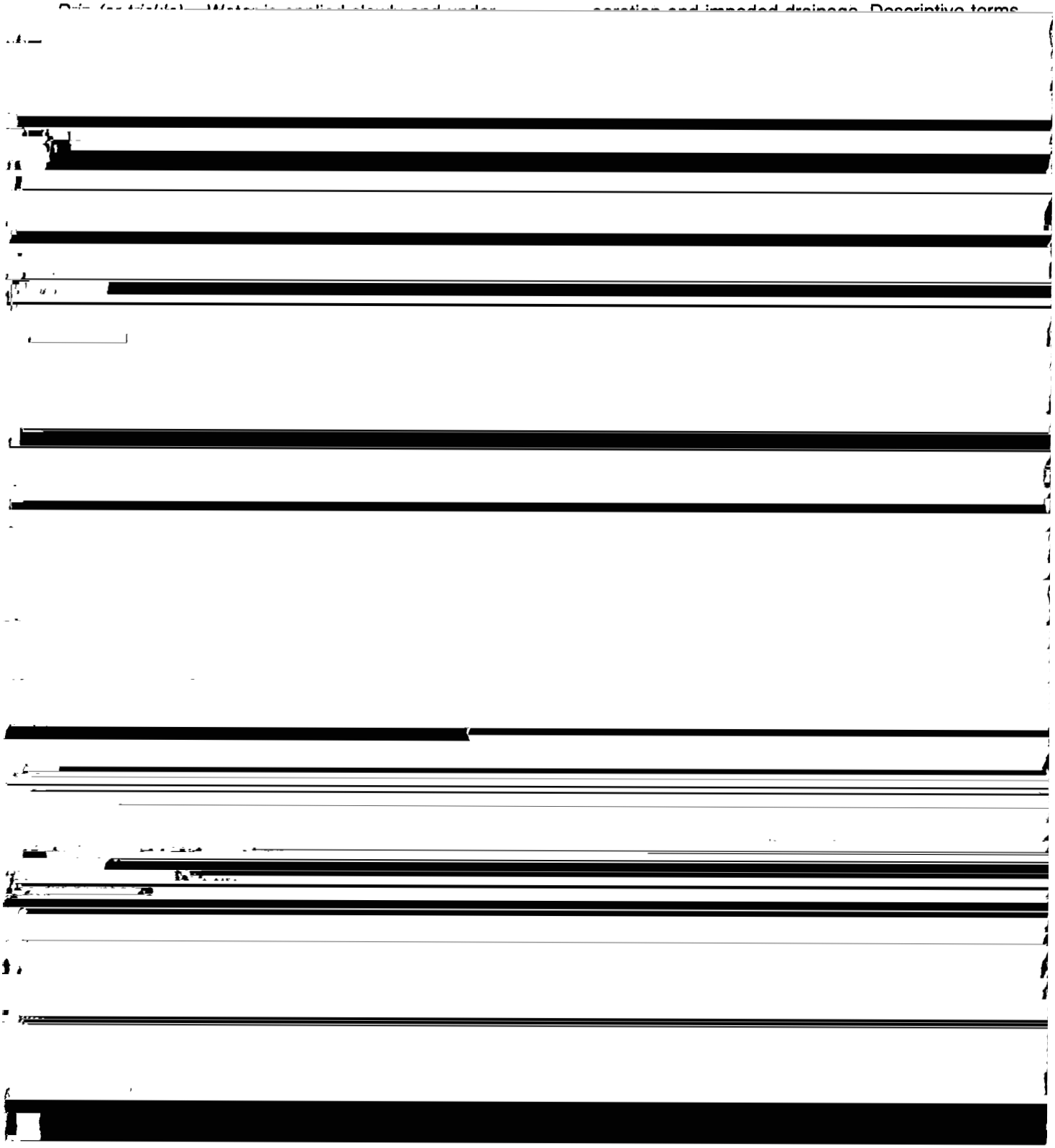
O horizon.—An organic layer of fresh and decaying plant residue.

soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the



Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

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

[redacted]

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, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Galesburg, Illinois]

Month	Temperature					Precipitation			
	Average	Average	Average	2 years in 10 will have--	Average number of	Average	2 years in 10 will have--	Average	Average

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-78 at Galesburg, Illinois]

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--	Apr. 13	Apr. 25	May 5
2 years in 10 later than--	Apr. 9	Apr. 20	May 1
5 years in 10 later than--	Apr. 1	Apr. 10	Apr. 23
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 20	Oct. 13	Oct. 1
2 years in 10 earlier than--	Oct. 25	Oct. 18	Oct. 6
5 years in 10 earlier than--	Nov. 3	Oct. 27	Oct. 16

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-78 at Galesburg, Illinois]

	Daily minimum temperature during growing season

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
7D3	Atlas silty clay loam, 10 to 18 percent slopes, severely eroded	1,419	0.3
8D2	Hickory silt loam, 10 to 15 percent slopes, eroded	9,638	2.1
8E2	Hickory silt loam, 15 to 30 percent slopes, eroded	20,276	4.3
8G	Hickory loam, 30 to 50 percent slopes	6,696	1.4
17	Keomah silt loam	5,478	1.2
19C3	Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded	2,007	0.4
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded	636	0.1
36B	Tama silt loam, 1 to 4 percent slopes	69,647	14.9
36B2	Tama silty clay loam, 2 to 5 percent slopes, eroded	19,399	4.2
36C2	Tama silty clay loam, 5 to 10 percent slopes, eroded	26,079	5.6
36D2	Tama silty clay loam, 10 to 15 percent slopes, eroded	849	0.2
43A	Ipava silt loam, 0 to 3 percent slopes	79,128	16.9
45	Denny silt loam	1,166	0.2
68	Sable silty clay loam	15,176	3.3
74	Radford silt loam	4,707	1.0
77	Huntsville silt loam	5,307	1.1
81B	Littleton silt loam, 1 to 3 percent slopes	1,508	0.3
104	Virgil silt loam	299	0.1
107+	Sawmill silty clay loam, overwash	6,086	1.3
119D2	Elco silt loam, 8 to 15 percent slopes, eroded	9,306	2.0
119E2	Elco silt loam, 15 to 20 percent slopes, eroded	4,494	1.0

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
2902A	Ipava-Urban land-Sable complex, 0 to 3 percent slopes	2,455	0.5
	Water	4,285	0.9
	Total	466,560	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name]

Map symbol	Soil name
17	Keomah silt loam (where drained)
36B	Tama silt loam, 1 to 4 percent slopes
36B2	Tama silty clay loam, 2 to 5 percent slopes, eroded
43A	Ipava silt loam, 0 to 3 percent slopes
45	Denny silt loam (where drained)
68	Sable silty clay loam (where drained)
74	Radford silt loam
77	Huntsville silt loam
81B	Littleton silt loam, 1 to 3 percent slopes
104	Virgil silt loam (where drained)
107	Sawmill silty clay loam, overwash (where drained and either protected from flooding or not

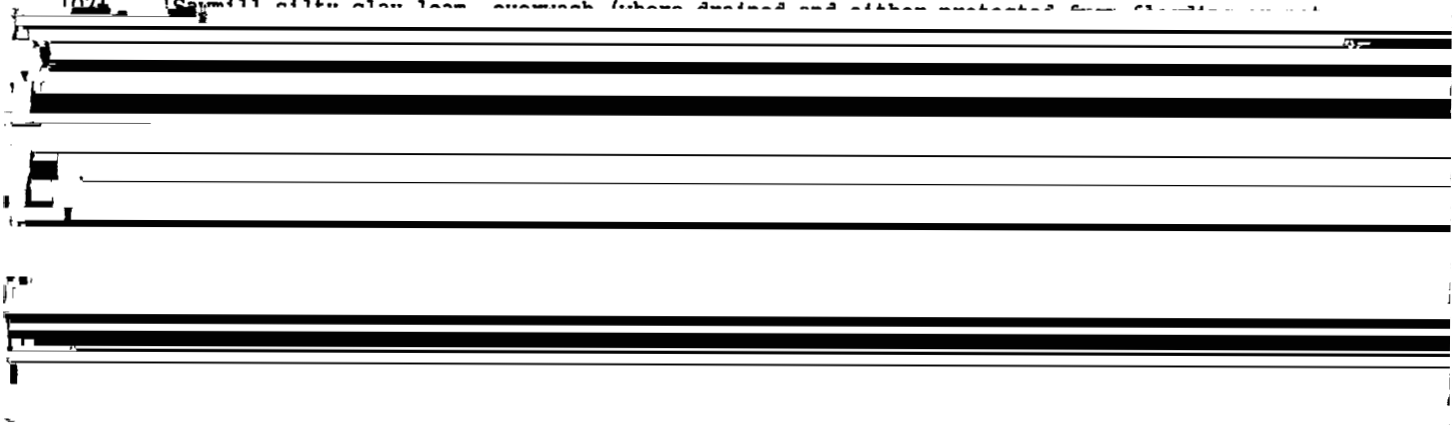


TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
7D3---------- Atlas	VIe	---	---	15	34	1.7	2.8
8D2---------- Hickory	IIIe	72	23	26	50	2.7	4.5
8E2---------- Hickory	VIe	---	---	---	---	2.1	3.6
8G---------- Hickory	VIIe	---	---	---	---	---	3.0
17---------- Keomah	IIw	129	39	52	72	5.1	8.6
19C3---------- Sylvan	IVe	97	30	46	57	4.3	7.2
19D3---------- Sylvan	IVe	93	29	44	55	4.1	6.9
36B---------- Tama	IIe	153	46	61	88	5.8	9.7
36B2---------- Tama	IIe	149	44	60	85	5.7	9.4
36C2---------- Tama	IIIe	146	43	58	84	5.5	9.2
36D2---------- Tama	IIIe	140	41	56	80	5.3	8.8
43A---------- Ipava	I	163	52	66	91	6.1	10.2
45---------- Denny	IIw	113	37	47	62	4.0	6.7
68---------- Sable	IIw	156	51	61	85	5.6	9.3
74---------- Radford	IIw	98	29	33	68	3.6	5.8
77---------- Huntsville	IIw	106	34	45	60	4.1	6.8
81B---------- Littleton	IIe	157	49	62	89	6.0	10.1
104---------- Virgil	I	148	45	60	84	5.6	9.3
107+---------- Sawmill	IIw	147	47	54	76	5.5	8.8
119D2---------- Elco	IIIe	104	34	44	60	4.1	6.8

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
119E2---------- Elco	IVe	97	---	41	56	3.8	6.4
131B---------- Alvin	IIe	97	33	48	---	4.3	7.1
131D---------- Alvin	IIIe	92	31	45	---	4.0	6.7
131E---------- Alvin	VIe	---	---	---	---	3.1	5.3
134B---------- Camden	IIe	124	39	54	71	5.0	8.2
134C2---------- Camden	IIIe	121	38	53	70	4.9	8.1
134D2---------- Camden	IVe	113	35	50	65	4.5	7.5
239---------- Dorchester	IIw	112	40	46	65	4.5	7.5
249---------- Edinburg	IIw	132	43	55	72	4.6	7.6
257---------- Clarksdale	I	140	43	57	79	5.3	8.5
259C2---------- Assumption	IIIe	123	37	54	74	4.8	8.0
259D2---------- Assumption	IIIe	116	35	51	70	4.6	7.6
259D3---------- Assumption	IVe	91	---	40	55	3.6	5.9
279B---------- Rozetta	IIe	130	40	53	72	5.1	8.6
279C2---------- Rozetta	IIIe	123	38	51	69	4.9	8.2
280B---------- Fayette	IIe	128	39	52	72	5.1	8.6
280C2---------- Fayette	IIIe	121	37	50	69	4.9	8.2
280D2---------- Fayette	IIIe	116	35	48	66	4.7	7.8
280E---------- Fayette	VIe	---	---	---	60	4.3	7.2
344B---------- Harvard	IIe	131	41	53	77	5.1	8.6
386B---------- Downs	IIe	147	43	58	82	5.5	9.2

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
415---------- Orion	IIw	115	37	---	61	4.0	6.6
451---------- Lawson	IIw	130	43	---	80	5.5	---
533**. Urban land							
536**. Dumps							
549D2---------- Marseilles	IVe	90	---	40	56	3.8	6.3
549E---------- Marseilles	VIIe	---	---	---	---	---	5.4
549G---------- Marseilles	VIIe	---	---	---	---	---	3.3
567B2---------- Elkhart	IIe	131	39	52	72	5.0	8.4
567C2---------- Elkhart	IIIe	128	38	51	71	4.9	8.2
567D3---------- Elkhart	IVe	110	---	44	61	4.2	7.1
660C2---------- Coatsburg	IIIe	73	23	25	40	2.9	4.8
801B, 802B. Orthents							
863**, 864**, 865**. Pits							
871B---------- Lenzburg	IIe	75	23	26	---	3.4	5.5
871D---------- Lenzburg	VIe	---	---	---	---	2.5	4.2

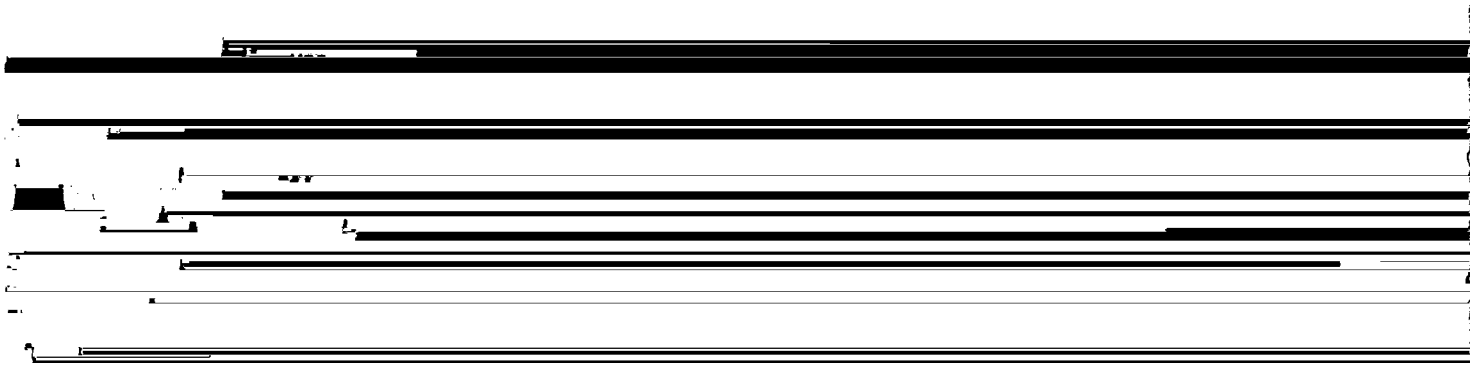


TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
2902A**. Ipava-Urban land-Sable							

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
7D3---------- Atlas	4C	Slight	Slight	Moderate	Moderate	White oak---------- Northern red oak---- Bur oak---------- Green ash----------	70 70 70 ---	4 4 --- ---	Green ash, pin oak, red maple, Austrian pine.
8D2---------- Hickory	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black oak---------- Green ash---------- Bitternut hickory--- Yellow-poplar-------	85 85 --- --- --- 95	4 4 --- --- --- 7	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
8E2---------- Hickory	4R	Moderate	Moderate	Slight	Slight	White oak---------- Northern red oak---- Black oak---------- Green ash---------- Bitternut hickory--- Yellow-poplar-------	85 85 --- --- --- 95	4 4 --- --- --- 7	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
8G---------- Hickory	4R	Severe	Severe	Slight	Slight	White oak---------- Northern red oak---- Black oak---------- Green ash---------- Bitternut hickory--- Yellow-poplar-------	85 85 --- --- --- 95	4 4 --- --- --- 7	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
19C3, 19D3------ Sylvan	6A	Slight	Slight	Slight	Slight	Yellow-poplar------- White oak---------- Northern red oak---- Black walnut--------	90 80 80 ---	6 4 4 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
107+---------- Sawmill	4W	Slight	Moderate	Moderate	Moderate	Pin oak---------- Eastern cottonwood-- Sweetgum---------- Cherrybark oak------ American sycamore---	90 --- --- --- ---	4 --- --- --- ---	American sycamore, hackberry, green ash, pin oak, red maple, swamp white oak.
119D2---------- Elco	4A	Slight	Slight	Slight	Slight	White oak---------- Northern red oak---- Black walnut--------	80 --- ---	4 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow	Common trees	Site index	Productivity	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Productivity class*	
386B---------- Downs	4A	Slight	Slight	Slight	Slight	White oak----------	80	4	Eastern white pine, northern red oak, green ash, yellow-poplar.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
415---------- Orion	2W	Slight	Moderate	Slight	Slight	Silver maple--------	80	2	White spruce, silver maple, white ash, eastern cottonwood.
						Red maple----------	---	---	
						White ash----------	---	---	
549D2---------- Marseilles	3A	Slight	Slight	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	
549E---------- Marseilles	3R	Moderate	Moderate	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	
549G---------- Marseilles	3R	Severe	Severe	Slight	Slight	White oak----------	66	3	White oak, northern red oak, black oak, white ash, eastern white pine, Scotch pine, black walnut.
						Northern red oak----	66	3	
						Black oak----------	---	---	
						White ash----------	---	---	
871B---------- Lenzburg	3A	Slight	Slight	Slight	Slight	Black walnut--------	73	---	Black walnut, green ash, white ash, eastern cottonwood.
						Sweetgum----------	---	---	
						Eastern cottonwood--	---	---	
871D---------- Lenzburg	3R	Moderate	Moderate	Slight	Slight	Black walnut--------	73	---	Black walnut, green ash, white ash, eastern cottonwood.
						Sweetgum----------	---	---	
						Eastern cottonwood--	---	---	
871G---------- Lenzburg	3R	Severe	Severe	Slight	Slight	Black walnut--------	73	---	Black walnut, green ash, white ash, eastern cottonwood.
						Sweetgum----------	---	---	
						Eastern cottonwood--	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
7D3---------- Atlas	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
8D2, 8E2, 8G------ Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
17---------- Keomah	---	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
19C3, 19D3-------- Sylvan	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
36B, 36B2, 36C2, [illegible]	---	American	Blue spruce.	Norway spruce,	Eastern white

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
74---------- Radford	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar.	Norway spruce-----	Eastern white pine, pin oak.
77---------- Huntsville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
81B---------- Littleton	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Eastern white pine, Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Pin oak.
104---------- Virgil	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
107+---------- Sawmill	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
119D2, 119E2------	---	Silky dogwood,			

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
239---------- Dorchester	---	Tatarian honeysuckle, Siberian peashrub.	Green ash, osageorange, eastern redcedar, northern white-cedar, white spruce, nannyberry viburnum, Washington hawthorn.	Black willow, golden willow.	Eastern cottonwood.
249----------	---	Amur privet, Amur	Norway spruce.	Eastern white pine	Pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

map symbol	<8	8-15	16-25	26-35	>35
415---------- Orion	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
451---------- Lawson	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
533*. Urban land					
536*. Dumps					
549D2, 549E, 549G- Marseilles	Siberian peashrub	Tatarian honeysuckle, lilac, Amur honeysuckle, autumn-olive, Washington hawthorn, eastern redcedar, radiant crabapple.	Jack pine, red pine, Austrian pine, eastern white pine.	---	---
567B2, 567C2, 567D3---------- Elkhart	---	Amur privet, Amur honeysuckle, American	White fir, blue spruce, northern white-cedar,	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

TABLE 8 --WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
872B---------- Rapatee	Tatarian honeysuckle, Siberian peashrub.	Eastern redcedar, jack pine, Washington hawthorn, osageorange, Russian-olive.	Honeylocust, northern catalpa.	---	---
2036C*: Tama----------	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2901B*: Ipava----------	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
Urban land.					
Tama----------	---	American	Blue spruce,	Norway spruce,	Eastern white

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
7D3---------- Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
8D2---------- Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8E2---------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8G---------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
17---------- Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight----------	Slight.
19C3---------- Sylvan	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
19D3---------- Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
36B, 36B2---------- Tama	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
36C2---------- Tama	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
36D2---------- Tama	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
43A---------- Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
45---------- Denny	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68---------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
74---------- Radford	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
77---------- Huntsville	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
81B---------- Littleton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
104---------- Virgil	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
107+---------- Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
119D2---------- Elco	Moderate: slope,	Moderate: slope,	Severe: slope.	Severe: erodes easily.	Moderate: slope.
119E2---------- Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
131B---------- Alvin	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
344B---------- Harvard	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
386B---------- Downs	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
415---------- Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
451---------- Lawson	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
533*. Urban land					
536*. Dumps					
549D2---------- Marseilles	Moderate: slope,	Moderate: slope,	Severe: slope.	Severe: erodes easily	Moderate:

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

			Playgrounds	Paths and trails	Golf fairways

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
7D3---------- Atlas	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
8D2---------- Hickory	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
8E2---------- Hickory	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
8G---------- Hickory	Very poor	Poor	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
17---------- Keomah	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
19C3, 19D3--------- Sylvan	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
36B, 36B2---------- Tama	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
36C2, 36D2--------- Tama	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
43A---------- Ipava	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
45---------- Denny	Good	Good	Good	Fair	Good	Good	Good	Fair	Good.
68---------- Sable	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
74---------- Radford	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
77---------- Huntsville	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
81B---------- Littleton	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
104---------- Virgil	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
107+---------- Sawmill	Good	Good	Good	Fair	Good	Fair	Good	Fair	Fair.
119D2---------- Elco	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
119E2---------- Elco	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
131B---------- Alvin	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
131D---------- Alvin	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
131E---------- Alvin	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
134B---------- Camden	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
134C2---------- Camden	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
134D2---------- Camden	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
239---------- Dorchester	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Poor	Poor.
249---------- Edinburg	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
257---------- Clarksdale	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
259C2, 259D2, 259D3---------- Assumption	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
279B---------- Rozetta	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
279C2---------- Rozetta	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
280B---------- Fayette	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280C2, 280D2------- Fayette	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
280E---------- Fayette	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
344B---------- Harvard	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
386B---------- Downs	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
415---------- Orion	Good	Good	Good	Good	Good	Fair	Good	Good	Good.
451---------- Lawson	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
533*. Urban land									
536*. Dumps									
549D2---------- Marseilles	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain	Grasses	Wild herba-	Hardwood	Wetland	Shall-			

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
7D3---------- Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: low strength, wetness.	Severe: wetness.
8D2---------- Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8E2, 8G---------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
17---------- Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, frost action, low strength.	Slight.
19C3---------- Sylvan	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
19D3---------- Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
36B, 36B2--------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
36C2---------- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
36D2---------- Tama	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
43A---------- Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
45---------- Denny	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
68---------- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
74---------- Radford	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
77---------- Huntsville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: flooding.
81B---------- Littleton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
104---------- Virgil	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
107+---------- Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
119D2---------- Elco	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
119E2---------- Elco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
131B---------- Alvin	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
131D---------- Alvin	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
131E---------- Alvin	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
134B---------- Camden	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
134C2---------- Camden	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
134D2---------- Camden	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
239---------- Dorchester	Severe: excess humus.	Severe: flooding.	Severe: flooding, low strength.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
249---------- Edinburg	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding.	Severe: ponding.
257---------- Clarksdale	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, frost action, low strength.	Moderate: wetness.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
549E, 549G--------- Marseilles	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
567B2---------- Elkhart	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
567C2---------- Elkhart	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
567D3---------- Elkhart	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
660C2---------- Coatsburg	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: low strength, wetness.	Severe: wetness.
801B, 802B.						

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
7D3---- Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Poor: too clayey, hard to pack.
8D2---- Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Fair: too clayey, slope.
8E2, 8G---- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
17---- Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
19C3---- Sylvan	Slight----	Severe: slope.	Slight----	Good.
19D3---- Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope.
36B, 36B2---- Tama	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
36C2---- Tama	Moderate: wetness.	Severe: slope.	Moderate: wetness.	Fair: too clayey.
36D2---- Tama	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope.	Fair: too clayey, slope.
43A---- Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
45---- Denny	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Poor: ponding.
68---- Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
74---- Radford	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Poor: wetness.
77---- Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
81B---- Littleton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
104---- Virgil	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.

TABLE 12.--SANITARY FACILITIES--Continued

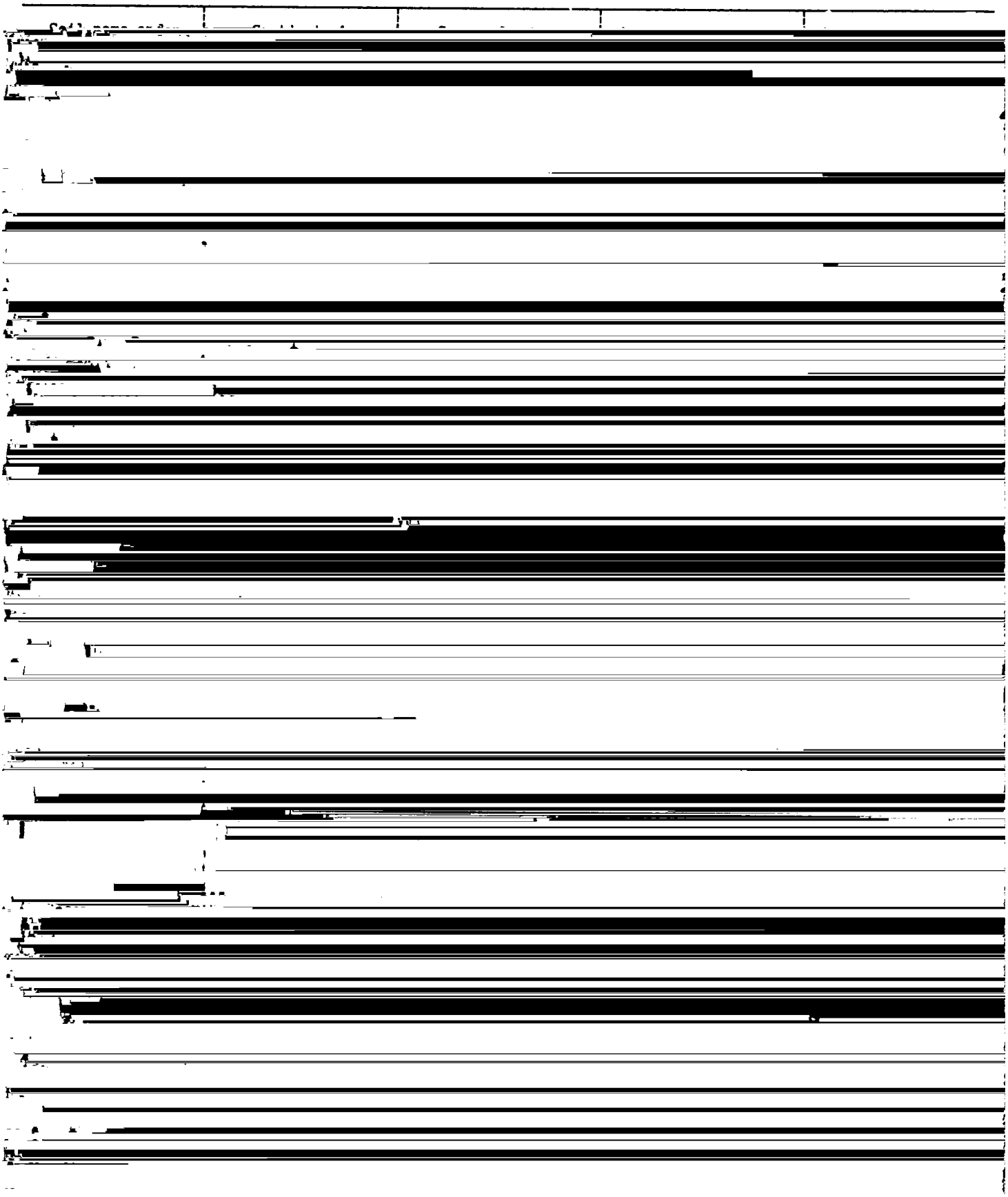


TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
280B---------- Fayette	Slight----------	Moderate: slope, seepage.	Slight----------	Fair: too clayey.
280C2---------- Fayette	Slight----------	Severe: slope.	Slight----------	Fair: too clayey.
280D2---------- Fayette	Moderate: slope.	Severe: slope.	Moderate: slope.	Fair: slope, too clayey.
280E---------- Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
344B---------- Harvard	Moderate: percs slowly.	Severe: seepage.	Slight----------	Fair: too clayey.
386B---------- Downs	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
415---------- Orion	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Poor: wetness.
451---------- Lawson	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
533*. Urban land				
536*. Dumps				
549D2---------- Marseilles	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Poor: depth to rock, too clayey,
549E, 549G---------- Marseilles	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
567B2---------- Elkhart	Slight----------	Moderate: seepage, slope.	Slight----------	Good.
567C2---------- Elkhart	Slight----------	Severe: slope.	Slight----------	Good.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Area sanitary landfill	Daily cover for landfill
863*, 864*, 865*. Pits				
871B---------- Lenzburg	Severe: percs slowly.	Moderate: slope.	Slight----------	Fair: too clayey, small stones.
871D, 871G---------- Lenzburg	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Poor: slope.
872B---------- Rapatee	Severe: percs slowly.	Moderate: slope.	Slight----------	Fair: too clayey, small stones.
2036C*: Tama----------	Moderate: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.				
2901B*: Ipava----------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Urban land.				
Tama----------	Moderate:			

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
7D3 Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
8D2 Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
8E2 Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
8G Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
17 Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
19C3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
19D3 Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
36B, 36B2, 36C2 Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
36D2 Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
43A Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
45 Denny	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
68 Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
74 Radford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
77 Huntsville	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
81B Littleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
104 Virgil	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
107+ Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
119D2---------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
119E2---------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
131B---------- Alvin	Good----------	Probable----------	Improbable: too sandy.	Good.
131D---------- Alvin	Good----------	Probable----------	Improbable: too sandy.	Fair: slope.
131E---------- Alvin	Fair: slope.	Probable----------	Improbable: too sandy.	Poor: slope.
134B, 134C2---------- Camden	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
134D2---------- Camden	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
239---------- Dorchester	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
249---------- Edinburg	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
257---------- Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
259C2---------- Assumption	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
259D2---------- Assumption	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
259D3---------- Assumption	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
279B, 279C2---------- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
280B, 280C2---------- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
280D2---------- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
280E----------	Poor:	Improbable:	Improbable:	Poor:

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
533*. Urban land				
536*. Dumps				
549D2---------- Marseilles	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
549E---------- Marseilles	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
549G---------- Marseilles	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
567B2, 567C2---------- Elkhart	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
567D3---------- Elkhart	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
660C2---------- Coatsburg	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
801B, 802B. Orthents				
863*, 864*, 865*. Pits				
871B---------- Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
871D---------- Lenzburg	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
871G---------- Lenzburg	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
872B---------- Rapatee	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
2036C*: Tama----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2901B*: Ipava----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2901B*: Urban land.				
Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
2902A*: Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
7D3---------- Atlas	Severe: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Slope, wetness.	Wetness, slope.
8D2, 8E2, 8G------ Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
17---------- Keomah	Slight---------	Severe: hard to pack.	Frost action, percs slowly.	Wetness, percs slowly.	Wetness, erodes easily, percs slowly.	Erodes easily, percs slowly.
19C3---------- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
19D3---------- Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
36B---------- Tama	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Erodes easily	Erodes easily.
36B2, 36C2---------	Moderate:	Slight---------	Deep to water	Slope----------	Erodes easily	

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
131B---------- Alvin	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, slope.	Soil blowing---	Favorable.
131D, 131E-------- Alvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing.	Slope.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
536*. Dumps						
549D2, 549E, 549G- Marseilles	Severe: slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
567B2, 567C2------ Elkhart	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
567D3---------- Elkhart	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope, erodes easily.	Slope, erodes easily.
660C2---------- Coatsburg	Severe: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
801B, 802B. Orthents						
863*, 864*, 865*. Pits						
871B---------- Lenzburg	Moderate: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Large stones, erodes easily.	Erodes easily.
871D---------- Lenzburg	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, large stones, erodes easily.	Slope, erodes easily.
871G---------- Lenzburg	Severe: slope.	Moderate: piping.	Deep to water		Slope, large stones, erodes easily.	Slope, erodes easily.
872B---------- Rapatee	Moderate: slope.	Severe: piping.	Deep to water	Droughty, percs slowly, rooting depth.	Erodes easily, percs slowly.	Erodes easily, droughty.
2036C*: Tama----------	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
Urban land.						
2901B*: Ipava----------	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
Tama----------	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
2902A*: Ipava----------	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
Urban land.						
Sable----------	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7D3----------	0-11	Silty clay loam	CH, CL	A-7	0	100	100	95-100	75-95	45-65	30-40
Atlas	11-60	Silty clay loam, silty clay, clay loam.	CH	A-7	0	100	95-100	95-100	80-95	50-70	30-45
8D2, 8E2---------	0-17	Silt loam--------	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
Hickory	17-40	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	40-60	Clay loam, sandy	CL-ML, CL	A-4, A-6	0-5	85-100	85-95	80-95	60-80	20-40	5-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
77---------- Huntsville	0-27	Silt loam--------	CL	A-6	0	100	95-100	90-100	85-100	25-40	10-20
	27-52	Silt loam--------	CL	A-6	0	100	95-100	90-100	85-100	20-35	10-20
	52-60	Silt loam, loam, very fine sandy loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0	95-100	90-100	85-95	30-85	20-35	5-20
81B---------- Littleton	0-6	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	7-20
	6-32	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	7-20
	32-60	Silt loam--------	CL-ML, CL	A-4, A-6, A-7	0	100	100	95-100	80-100	20-45	5-20
104---------- Virgil	0-13	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	85-95	20-35	8-20
	13-47	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	47-60	Loam, sandy loam, clay loam.	CL, SC, SM-SC, CL-ML	A-2, A-4, A-6	0-5	90-100	85-100	70-100	30-90	20-35	5-15
107+---------- Sawmill	0-25	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	25-38	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-50	15-30
	38-54	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	100	100	85-100	70-95	25-50	8-25
	54-60	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	100	75-100	65-95	20-50	8-30
119D2, 119E2-----	0-4	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15

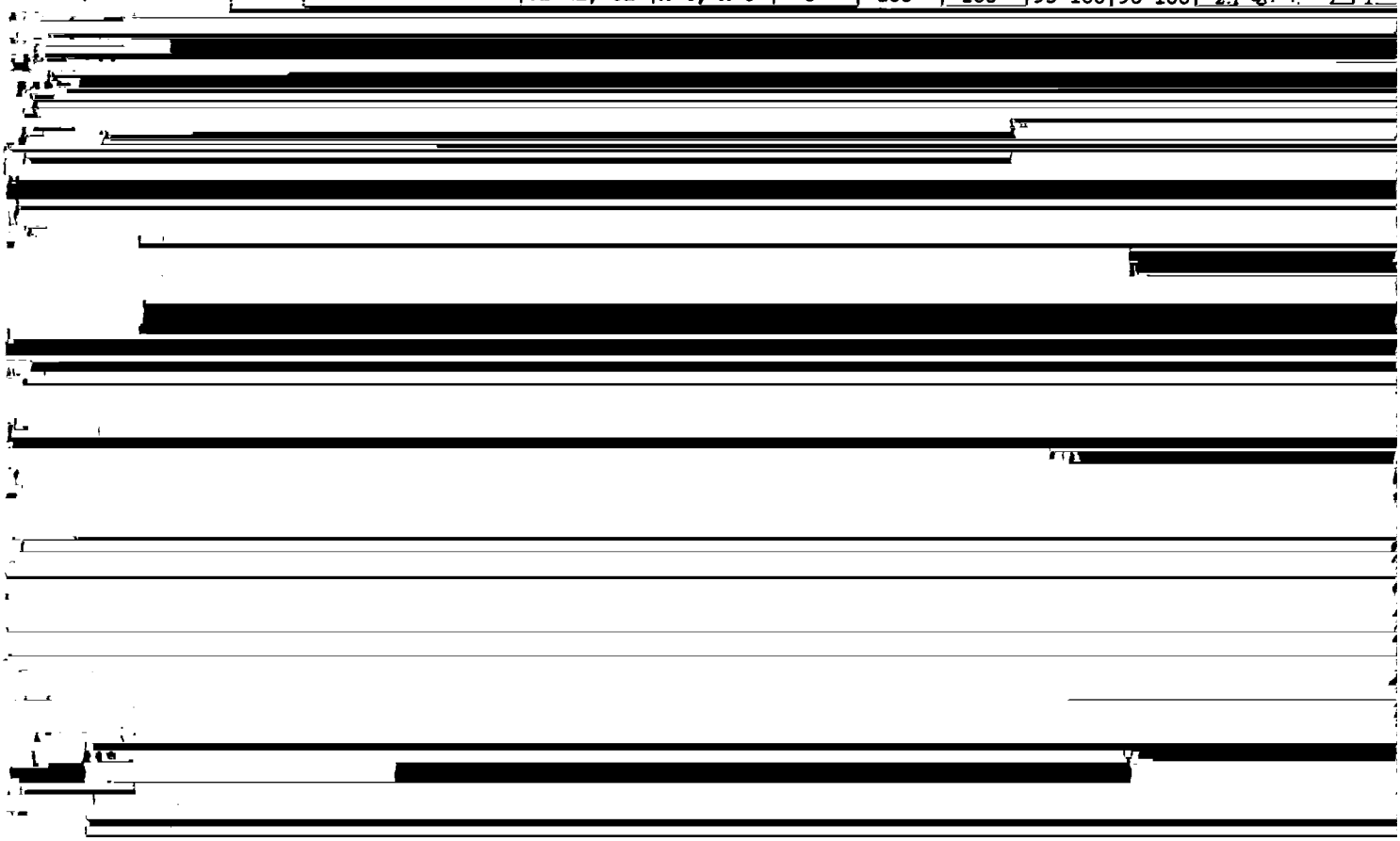


TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
257----------	0-10	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
Clarksdale	10-42	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	25-40
	42-60	Silt loam, silty clay loam.	CL	A-6	0	98-100	98-100	95-100	90-100	25-40	10-25
259C2, 259D2-----	0-9	Silt loam--------	CL, ML	A-6, A-4	0	100	100	95-100	90-100	25-40	8-20
Assumption	9-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-30
	27-60	Clay loam, loam	CL	A-6, A-7	0-5	100	95-100	90-100	70-90	35-50	20-35
259D3----------	0-5	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	15-30

[redacted]

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
567B2, 567C2-----	0-8	Silty clay loam	CL	A-6, A-7	0	100	100	100	95-100	35-50	18-30

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2901B*:											
Tama----------	0-13	Silt loam--------	ML	A-6, A-7	0	100	100	100	95-100	35-50	10-20
	13-47	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	15-25
	47-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
2902A*:											
Ipava----------	0-10	Silt loam--------	ML, CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	10-37	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-70	25-40
	37-60	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
Urban land.											
Sable----------	0-21	Silty clay loam	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	21-44	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	44-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
7D3----------	0-11	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High---------	0.32	2	7	.5-2
Atlas	11-60	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High---------	0.32			
8D2, 8E2, 8G-----	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
Hickory	17-40	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	40-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
17----------	0-12	16-22	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	5	6	1-2
Keomah	12-38	27-42	1.30-1.45	0.2-0.6	0.18-0.20	4.5-5.5	High---------	0.37			
	38-60	24-38	1.40-1.55	0.2-0.6	0.18-0.20	5.1-6.5	Moderate-----	0.37			
19C3, 19D3-------	0-8	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate-----	0.37	4	7	<1
Sylvan	8-27	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	27-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
36B----------	0-13	20-29	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.32	5	7	3-4
Tama	13-47	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.43			
	47-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
36B2, 36C2, 36D2-	0-8	20-29	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.32	5	7	3-4
Tama	8-42	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.43			
	42-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
43A----------	0-10	20-30	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	4-5
Ipava	10-37	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.43			
	37-60	20-27	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.43			
45----------	0-19	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	3-4
Denny	19-44	15-22	1.25-1.45	0.2-0.6	0.18-0.20	5.6-6.5	Low----------	0.37			
	44-60	35-45	1.20-1.40	0.06-0.2	0.11-0.22	5.6-6.5	High---------	0.37			
68----------	0-21	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	6	5-6
Sable	21-44	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	44-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.28			
74----------	0-26	18-27	1.40-1.60	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	6	2-4
Radford	26-60	24-35	1.35-1.55	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.28			
77----------	0-27	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.28	5	6	3-4
Huntsville	27-52	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Moderate-----	0.28			
	52-60	10-25	1.20-1.50	0.6-2.0	0.17-0.21	5.6-7.8	Low----------	0.28			
81B----------	0-6	18-27	1.25-1.45	0.6-2.0	0.20-0.24	5.6-7.8	Low----------	0.32	5	6	3-4
Littleton	6-32	22-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.32			
	32-60	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.43			
104----------	0-13	15-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.8	Low----------	0.32	5	6	2-4
Virgil	13-47	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.43			
	47-60	15-30	1.45-1.75	0.6-6.0	0.05-0.11	5.6-8.4	Low----------	0.28			
107+----------	0-25	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28	5	7	4-5
Sawmill	25-38	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate-----	0.28			
	38-54	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate-----	0.28			
	54-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	7.4-8.4	Moderate-----	0.28			
119D2, 119E2-----	0-4	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
Elco	4-22	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	22-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
131B, 131D, 131E--	0-20	10-15	1.45-1.65	2.0-6.0	0.14-0.20	5.1-6.5	Low----------	0.24	5	3	.5-1
Alvin	20-45	15-18	1.45-1.65	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.24			
	45-60	3-10	1.55-1.75	2.0-6.0	0.05-0.13	5.1-7.8	Low----------	0.24			
134B, 134C2,											
134D2----------	0-8	14-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-2
Camden	8-32	22-35	1.35-1.55	0.6-2.0	0.16-0.20	5.1-7.3	Moderate-----	0.37			
	32-44	18-30	1.45-1.65	0.6-2.0	0.15-0.25	5.6-7.3	Low----------	0.37			
	44-60	10-22	1.55-1.70	0.6-6.0	0.11-0.22	5.6-7.3	Low----------	0.37			
239----------	0-6	18-24	1.20-1.30	0.6-2.0	0.20-0.22	7.9-8.4	Low----------	0.37	5	6	.5-1
Dorchester	6-60	18-30	1.25-1.40	0.6-2.0	0.22-0.24	6.6-7.8	Moderate-----	0.37			
249----------	0-16	25-35	1.10-1.30	0.6-2.0	0.21-0.24	5.6-7.8	High---------	0.37	4	6	3-4
Edinburg	16-50	35-46	1.20-1.40	0.06-0.6	0.13-0.20	5.6-7.3	High---------	0.37			
	50-60	22-30	1.30-1.50	0.2-2.0	0.18-0.22	6.6-7.8	Moderate-----	0.37			
257----------	0-10	20-27	1.25-1.50	0.6-2.0	0.22-0.24	5.1-6.0	Moderate-----	0.37	5	6	2-3
Clarksdale	10-42	35-42	1.30-1.50	0.2-0.6	0.11-0.20	5.1-7.3	High---------	0.37			
	42-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	6.1-8.4	Moderate-----	0.37			
259C2, 259D2-----	0-9	20-27	1.10-1.30	0.6-2.0	0.22-0.24	5.6-6.5	Low----------	0.32	4	6	3-4
Assumption	9-27	25-35	1.20-1.40	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-----	0.43			
	27-60	30-45	1.40-1.65	0.2-0.6	0.14-0.20	5.1-6.5	Moderate-----	0.43			
259D3----------	0-5	27-35	1.15-1.35	0.6-2.0	0.19-0.21	5.1-6.5	Moderate-----	0.43	3	7	1-2
Assumption	5-22	25-35	1.20-1.40	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-----	0.43			
	22-60	30-45	1.40-1.65	0.2-0.6	0.14-0.20	5.1-6.5	Moderate-----	0.43			
279B, 279C2------	0-9	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Rozetta	9-53	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	53-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
280B, 280C2,											
280D2, 280E-----	0-11	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
Fayette	11-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
344B----------	0-7	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-3
Harvard	7-37	25-35	1.25-1.55	0.6-2.0	0.15-0.20	5.1-7.3	Moderate-----	0.43			
	37-45	15-35	1.30-1.60	0.6-2.0	0.12-0.19	5.6-7.8	Low----------	0.43			

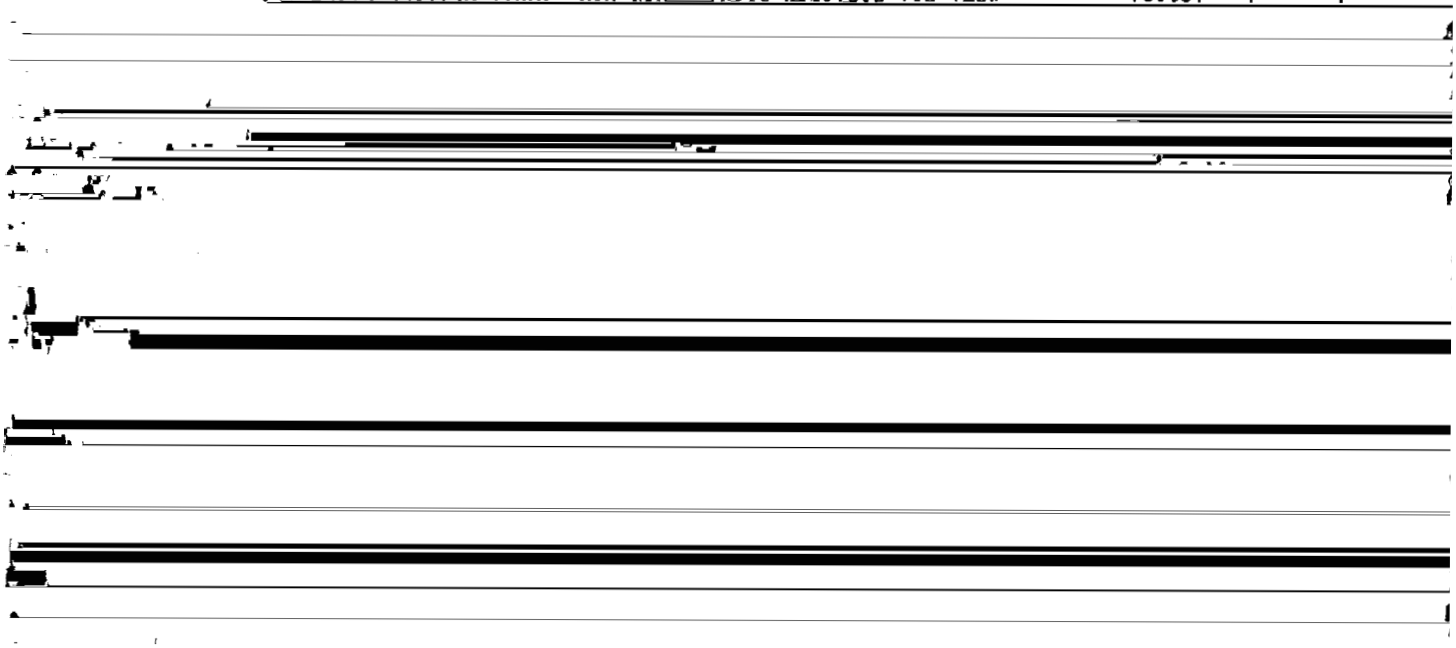


TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
7D3---------- Atlas	D	None--------	---	---	0-2.0	Perched	Apr-Jun	High-----	High-----	Moderate.
8D2, 8E2, 8G------ Hickory	C	None--------	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
17---------- Keomah	C	None--------	---	---	2.0-4.0	Apparent	Nov-Jul	High-----	High-----	Moderate.
19C3, 19D3-------- Sylvan	B	None--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
36B, 36B2, 36C2, 36D2---------- Tama	B	None--------	---	---	4.0-6.0	Apparent	Nov-Jun	High-----	Moderate	Moderate.
43A---------- Ipava	B	None--------	---	---	1.0-3.0	Apparent	Mar-May	High-----	High-----	Moderate.
45---------- Denny	D	None--------	---	---	+.5-2.0	Apparent	Mar-May	High-----	High-----	Moderate.
68---------- Sable	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
74---------- Radford	B	Occasional	Brief-----	Mar-May	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Low.
77---------- Huntsville	B	Occasional	Very brief to brief.	Jan-May	>6.0	---	---	High-----	Low------	Low.
81B---------- Littleton	B	None--------	---	---	1.0-3.0	Apparent	Apr-Jun	High-----	High-----	Low.
104---------- Virgil	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
107+---------- Sawmill	B/D	Frequent----	Brief-----	Mar-Jun	0-2.0	Apparent	Mar-Jun	High-----	High-----	Low.
119D2, 119E2------ Elco	B	None--------	---	---	2.5-4.5	Perched	Mar-May	High-----	High-----	Moderate.
131B, 131D, 131E-- Alvin	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.

...nued

...r table		Potential frost action	Risk of corrosion	
...d	Months		Uncoated steel	Concrete
...ent	Mar-Jun	High-----	Low------	Moderate.
...	---	High-----	High-----	Low.
...ent	Mar-Jun	High-----	High-----	Moderate.
...ent	Mar-Jun	High-----	High-----	Moderate.
...ned	Feb-May	High-----	High-----	Moderate.
...ent	Mar-Jun	High-----	Moderate	Moderate.
...	---	High-----	Moderate	Moderate.
...	---	High-----	Moderate	Moderate.
...ent	Mar-Jun	High-----	Moderate	Moderate.
...ent	Nov-May	High-----	High-----	Low.
...ent	Nov-May	High-----	Moderate	Low.
	---	High-----	High-----	Moderate.
	---	High-----	Moderate	Moderate.
...ed	Apr-Jun	High-----	High-----	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
801B, 802B. Orthents										
863*, 864*, 865*. Pits										
871B, 871D, 871G--Lenzburg	B	None	---	---	>6.0	---	---	Moderate	Moderate	Low.
872B--Rapatee	D	None	---	---	>6.0	---	---	High	Moderate	Low.
2036C*:										
Tama	B	None	---	---	4.0-6.0	Apparent	Nov-Jun	High	Moderate	Moderate.
Urban land.										
2901B*:										
Ipava	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
Urban land.										
Tama	B	None	---	---	4.0-6.0	Apparent	Nov-Jun	High	Moderate	Moderate.
2902A*:										
Ipava	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	High	High	Moderate.
Urban land.										
Sable	B/D	None	---	---	+.5-2.0	Apparent	Mar-Jun	High	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

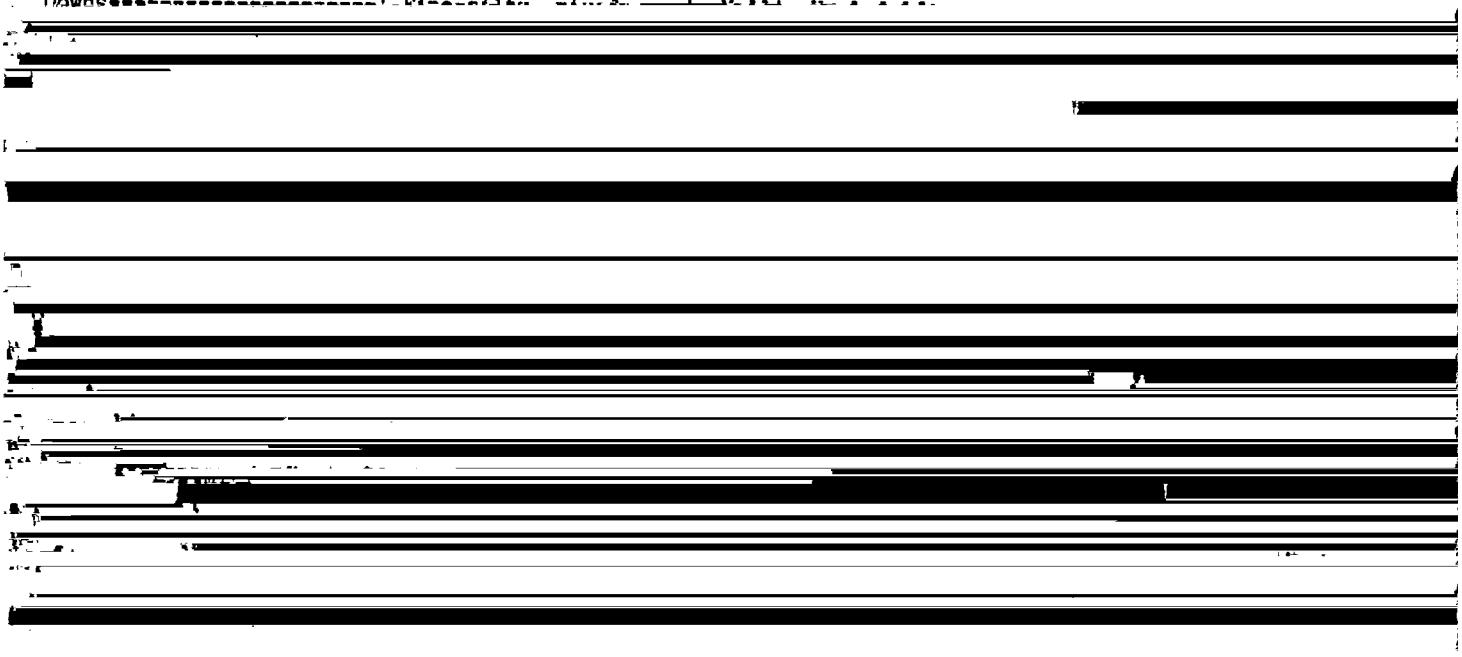
[Dashes indicate that data were not available. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; PI, plasticity index; and UN, Unified]

Soil name and location	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve--				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	UN
			In	Lb/ft^3	Pct					Pct			
Elco silt loam:	S78IL-095-24-1	Ap	0-4	96	23	100	100	100	98	40	13	A-7-6	ML
1,914 feet east and	S78IL-095-24-4	Bt3	16-22	103	20	100	100	99	95	38	20	A-6	CL
2,500 feet south of the	S78IL-095-24-5	Btg1	22-35	100	20	100	100	99	93	44	26	A-7-6	CL
northwest corner of sec. 35, T. 12 N., R. 4 E.													
Ipava silt loam:	S78IL-095-16-1	Ap	0-10	101	23	100	100	99	98	33	12	A-6	CL
2,046 feet west and 594	S78IL-095-16-4	Bt	24-31	96	24	100	100	100	99	53	31	A-7-6	CH
feet north of the	S78IL-095-16-7	Cg	50-60	112	16	100	100	100	100	33	11	A-6	CL
southeast corner of sec. 25, T. 13 N., R. 2 E.													
Keomah silt loam:	S78IL-095-3-1	Ap	0-6	103	18	100	99	95	92	28	4	A-4	ML
2,440 feet west and 200	S78IL-095-3-4	Btg1	17-26	95	21	100	100	100	99	51	31	A-7-6	CH
feet north of the	S78IL-095-3-7	Cg	48-60	107	19	100	100	100	99	39	19	A-6	CL
southeast corner of sec. 26, T. 12 N., R. 3 E.													
Lenzburg silty clay loam:	S77IL-095-77-1	Ap	0-2	90	26	99	98	95	84	50	12	A-7-5	OH
165 feet east and 2,211	S77IL-095-77-2	C1	2-17	---	---	90	80	73	62	33	11	A-6	CL
feet south of the	S77IL-095-77-3	C2	17-60	---	---	89	83	78	69	32	11	A-6	CL
northwest corner of sec. 29, T. 9 N., R. 4 E.													
Marseilles silt loam:	S78IL-095-61-1	A	0-6	109	19	99	98	95	80	39	10	A-4	ML
750 feet east and 132	S78IL-095-61-4	Bt2	14-22	99	23	100	99	98	94	39	14	A-6	CL
feet south of the	S78IL-095-61-7	Cr	34-60	114	17	100	99	98	91	35	12	A-6	CL
northwest corner of sec. 27, T. 12 N., R. 4 E.													

TABLE 19.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
*Assumption	Fine-silty, mixed, mesic Typic Argiudolls
Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Clarksdale	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Coatsburg	Fine, montmorillonitic, mesic, sloping Typic Argiaquolls
Denny	Fine, montmorillonitic, mesic Mollic Albaqualfs
Dorchester	Fine-silty, mixed (calcareous), mesic Typic Udifluvents
Downs	[illegible]



NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.