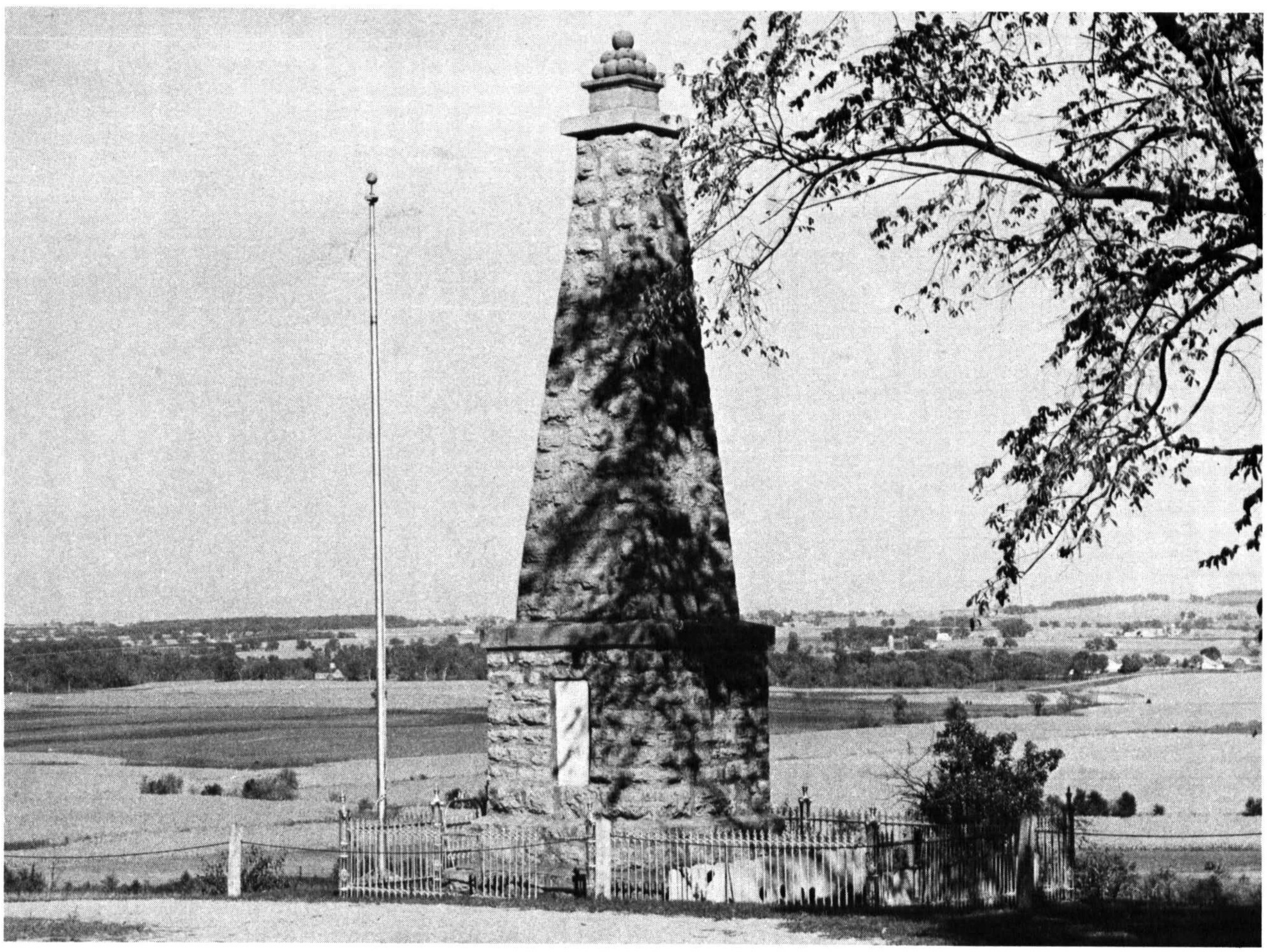
Soil Survey: Stephenson County, Illinois



SOIL SURVEY:

Monument erected to commemorate the Battle of Kellogg's Grove in 1832, the last encounter on Illinois soil of the Blackhawk War. This battle site is on the high elevations of the Silurian System of bedrock west of Pearl City and south of Kent. The view is slightly north of east, showing the broad, lower lying loess-covered area of the Yellow River Valley and the thin loess-covered shale and dolomite upland areas at the higher elevations on the horizon.

SOIL REPORT 99

Authors: B. W. Ray, Associate Professor of Pedology, and J. B. Fehrenbacher, Professor of Pedology, Department of Agronomy, University of Illinois at Urbana-Champaign; and R. Rehner and L. L. Acker, Soil Scientists, Soil Conservation Service, U.S. Department of Agriculture.

Fieldwork by B. W. Ray in charge, R. H. Anderson, R. C. Bruce, L. R. Follmer, C. J. Frazee, and G. F. Hall, University of Illinois Agricultural Experiment Station; and R. Rehner, P. S. Watters, A. H. Ashby, R. D. Busby, F. N. Carroll, L. W. Hacker, J. D. Harrold, R. E. Horton, and D. R. Mapes, Soil Conservation Service, U.S. Department of Agriculture.

Stephenson County, Illinois

University of Illinois Agricultural Experiment Station in cooperation with Soil Conservation Service, U.S. Department of Agriculture.

Report and maps published by the University of Illinois Agricultural Experiment Station.

APRIL, 1976 URBANA, ILLINOIS

CONTENTS

HOW TO USE THE SOIL MAP AND REPORT

This soil survey report, which includes a detailed soil map and a general soil map, can be helpful to all who desire information about the soils of Stephenson County, including farmers, foresters, engineers and builders, community planners, persons interested in wildlife and recreation, and many others. The location and extent of the general soil areas of Stephenson County, as shown on the general soil map on page 135, and the discussion of the general soil areas (pages 8 to 20) provide information that may be helpful to those interested in a broad view of the soil resources of the county. Many users, however, will be interested in specific tracts of land and the more detailed soil information provided on the map sheets at the back of the report.

Examine the soil map. The detailed soil map of Stephenson County consists of 49 sheets. Most sheets cover 12 sections; those on the western county boundary, however, are smaller and cover 9 sections. The area covered by each sheet is shown by the index that accompanies the numbered map sheets.

The aerial photo background of the map sheets shows a pattern of light and dark shades. In areas where most of the soil is cultivated, these color contrasts represent field boundaries and cropping patterns and sometimes soil color differences. In the hillier parts of the county, the dark portions of the map are usually forested areas, and the light-colored portions are usually the cleared and cultivated areas. Soil boundaries, soil symbols, streams, and cultural features such as roads, railroads, houses, dams, and levees are shown in black.

The soil symbols designate mapping units that are based on three characteristics: soil, average slope of the area, and estimated erosion conditions.

For three-part symbols, the first number indicates the soil name, the capital letter indicates the slope range, and the third part is a number that indicates the degree of erosion; for example, the symbol *36C2* is translated as Tama silt loam, 4- to 7-percent slopes, moderately eroded. Two-part symbols (such as *36B*) have no erosion symbol, which indicates that erosion is in the none to slight range. One-part symbols (such as *68*) have no slope or erosion designation, which indicates that the soil area has a slope range of 0 to 2 percent and erosion is in the none to slight range.

The slope symbols (capital letters) have the following definitions:

Slope symbol	Slope description	Slope range (%)
A	Nearly level	0 to 2
B	Gently sloping	2 to 4
C	Moderately sloping	4 to 7
D	Strongly sloping	7 to 12
E	Very strongly sloping	12 to 18
F	Steep	18 to 30

Seven of the map symbols contain letters for slope designation that deviate slightly from the percentage slope range given here. These deviations are noted and discussed where they appear.

The erosion symbols (numbers) have the following definitions:

Erosion symbol	Erosion description	Inches of original soil surface remaining
None	None to slight	More than 7
2	Moderate	3 to 7
3	Severe	Less than 3, or plow layer is largely subsoil material

An additional symbol is used to indicate a special soil condition in a few mapping units. A W preceding a soil number (for example, *W107*) indicates that the area is subject to frequent ponding or has a high water table and needs artificial drainage before it can have general use as cropland.

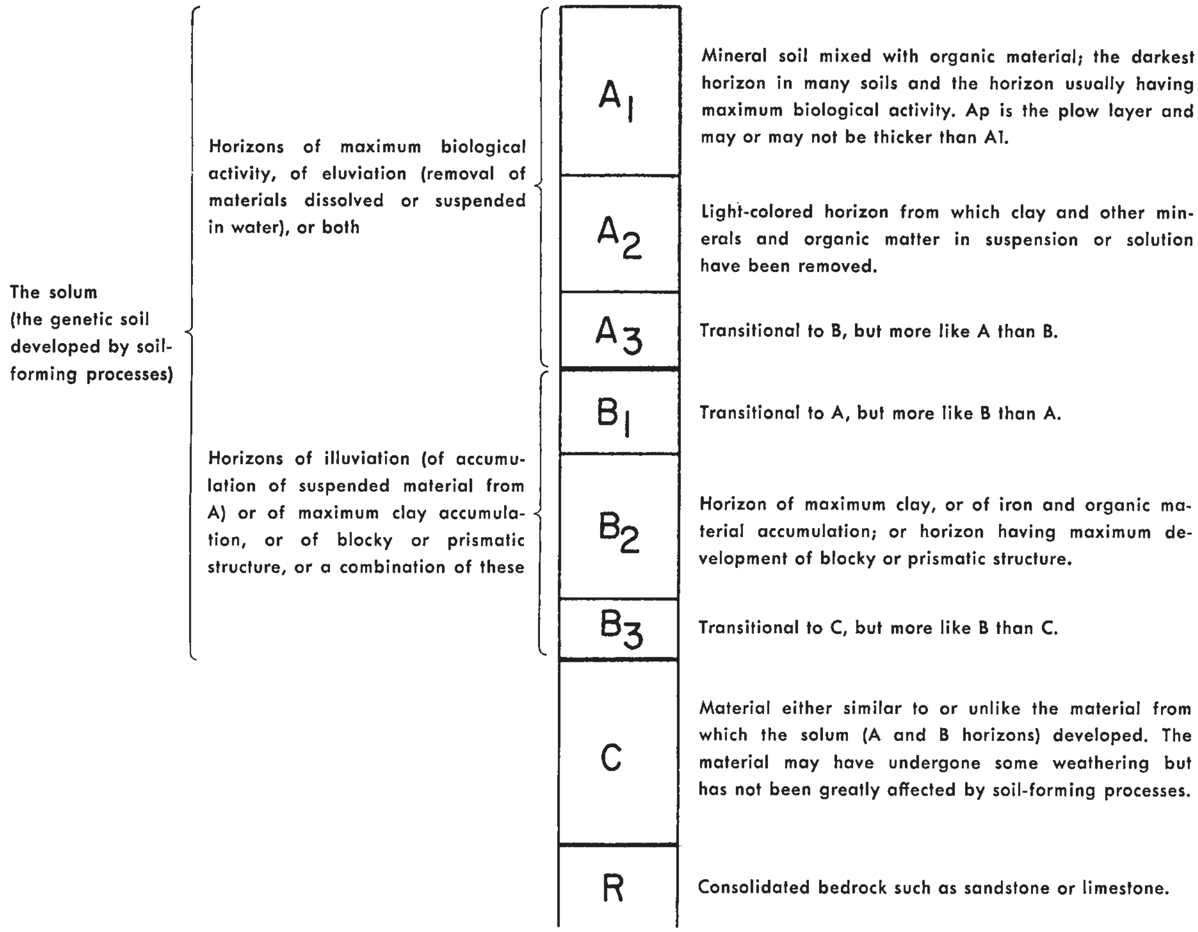
The mapping units, arranged numerically by soil numbers, are listed in the legend preceding the soil map and in the Guide to Mapping Units (pages 129-132).

To help find a particular farm or tract of land, many cultural features such as roads, railroads, towns, and farmhouses are shown on the soil map. Section boundaries, section numbers, township and range numbers, and physical features such as streams and ponds are also shown. If the legal description is known, a tract of land can be easily located by using township, range, and section numbers.

Study the characteristics of the soils. After locating a tract of land and identifying the mapping units on it, turn to the Guide to Mapping Units (page 129) to find where the different kinds of soils are described and where management and other features are discussed.

In studying the soil description, note that soils are classified and mapped on the basis of many characteristics to a depth of 4 or 5 feet, not on their surface character alone. Often the surface or A horizon of one soil is little or no different from that of another, yet the differences in the subsoil or B horizon or the C horizon of these two soils may be great, resulting in a difference in agricultural value. The nature of the B and C horizons is important in determining the drainability and moisture-supplying power of most soils, especially during critical periods of excess rainfall or drouths.

Most upland and terrace soils have three major horizons: A, B, and C. Sometimes an R horizon (solid bedrock) is encountered. The horizons used in this report are defined briefly in Figure 1 and in the Glossary on page 126. Other symbols are defined as follows: Ap is the surface plow layer in a cultivated soil; t indicates that the particular horizon shows evidence that silicate clays have been moved in from horizons above; g in-



Principal horizons of upland soils. Not every horizon and subhorizon shown here, however, is necessarily present in all soils. (Adapted from *Nomenclature of soil horizons*, U.S. Dept. Agr. Handbook 18, pp. 174-183. 1951.) (Fig. 1)

dicates that there is evidence of strong gleying or waterlogging in the designated horizon; b indicates a buried horizon that was originally a surface layer; II and III indicate that these materials are of different origin than the overlying soil material.

In studying characteristics of the various soils, it is important to understand that each soil series has a range of properties. As a result, therefore, the boundaries between soils on the landscape are not necessarily sharp.

HOW SOILS ARE CLASSIFIED, NAMED, AND MAPPED

This survey was made to learn what kinds of soils are in Stephenson County, where they are located, and how they can be used. Soil scientists went into the county knowing they would likely find many soils they had already seen and perhaps some they had not. As they worked throughout the county, they observed steepness, length, and shape of slopes; sizes of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. They also observed natural and manmade cuts that exposed profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and places more distant. They classified and named the soils according to nationwide uniform procedures. The soil series and soil phase are the categories of soil classification most used in a local survey *(25)*[1].

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils in one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped.

[1] Italicized numerals refer to entries in Literature Cited.

All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristics that affect use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, *Woodbine silt loam, 4- to 7-percent slopes, moderately eroded,* is one of the several phases within the Woodbine series.

After a guide for classifying and naming the soils was worked out, the soil scientists working in the field drew boundaries of the individual soils on aerial photographs. These photographs show such features as woodlands, buildings, field borders, trees, and other details that help in drawing soil boundaries accurately. The detailed soil maps in the back of this publication were prepared from aerial photographs.

The areas shown on the soil maps are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind seen within an area that is dominantly one recognized soil phase.

In some parts of a survey area, different kinds of soils may occupy small areas in such an intricate pattern that it is not practical to show them separately on the map. This kind of soil pattern is shown as one mapping unit and is called a soil complex. An example of this is the Keller-Coatsburg complex, 4- to 7-percent slopes, moderately eroded.

Areas may also be encountered where the soil pattern may not be extremely complicated or intricate but lacks regularity, so that soil separations cannot be made with a reasonable degree of accuracy. These areas are composed of two or more series, but in some cases the mapping unit may contain only one of the soils. These are called undifferentiated units. Such a unit mapped in Stephenson County is Dubuque and Dunbarton silt loams, 12- to 18-percent slopes, moderately eroded.

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are compared. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils (Table 4, pages 72-75).

Only part of a soil survey is finished when the soils have been named, described, and delineated on the map and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users — farmers, managers of woodland, engineers, and other land-use planners.

On the basis of yield and practice tables and other data, the soil scientists set up trial soil groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others; then they adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

NATURAL FEATURES OF STEPHENSON COUNTY

Location and Size

Stephenson County is located in the western part of extreme northern Illinois. It is bounded on the west by Jo Daviess County, on the south by Carroll and Ogle Counties, on the east by Winnebago County, and on the north by Wisconsin.

Freeport, the county seat, is located south and slightly east of the county center and is approximately 105 miles from Chicago, 70 miles from the Rock Island-Moline area, and 160 miles from the University of Illinois at Urbana-Champaign.

Stephenson County has a total area of 568 square miles or 363,520 acres. It is rectangular in shape, extending approximately 21 miles from north to south and 27 miles from east to west.

Physiography and Drainage

Stephenson County is located entirely within the Rock River Hill Country of the Till Plains Section of the Central Lowland Province (*18*).

The county was glaciated, but drift is thin in many areas and the major uplands and valleys are controlled mainly by the bedrock surface. This area consists of rolling hills considered to be in the stage of late youth to early maturity.

A rather prominent feature in the southwest corner of the county, south of Kent and Pearl City, is the Silurian escarpment (*29*), which rises above and south of the Yellow Creek Valley and marks the boundary between younger Ordovician and Silurian bedrock to the southwest and older Ordovician bedrock to the north and east.

Another prominent feature is the mound just east of Waddams Grove in the northwestern part of the county, standing about 160 feet above the level of much of the surrounding upland. It is considered an erosional remnant of Ordovician deposits younger than the surrounding area and has a cap of Silurian-age dolomite (*29*).

The highest point in the county is the crest of this mound at an elevation of approximately 1,168 feet above sea level. The lowest elevation is approximately

680 feet above sea level, where the East Plum River leaves the county about three-fourths of a mile east of the southwest corner of the county.[1]

Major drainage in Stephenson County is generally to the south and east by the Pecatonica River and its numerous tributaries. The Pecatonica River flows eastward into Winnebago County, leaving Stephenson County a little south of the midpoint of the eastern county boundary. The Pecatonica joins the Rock River east of Stephenson County, which discharges eventually into the Mississippi River southwest of Stephenson County.

The southwestern corner of the county forms the headwaters of the East Plum River, which drains southwestward to the Mississippi River. A few sections along the southern border in the southeastern part of the county, near German Valley, drain southeastward into the Leaf River, which then joins the Rock River.

Geology

The bedrock in Stephenson County belongs to the Ordovician or the Silurian Systems (*4, 13, 29*); it is generally covered by glacial drift or loess but occasionally outcrops. Ordovician dolomite is dominant and occurs as the uppermost bedrock in probably as much as three-fourths of the county. Ordovician-age shale of the Maquoketa Formation is important in the western part of the county, particularly the southwestern fourth, and because of its very high clay content is especially significant where it outcrops or where soil profiles are developed in it. Small areas near the surface or outcrops of Maquoketa Shale also occur in isolated areas in the extreme southern part of the county. According to Willman (*29*), dolomite of the Silurian System occurs on the higher elevations of the Silurian escarpment in the southwestern corner of the county, and small, isolated areas are found as the uppermost bedrock on the mound at Waddams Grove, on caps of the higher ridges near the village of Eleroy, and in isolated areas along the southern county boundary with Carroll County and northwestern Ogle County.

Ordovician-age sandstone is the uppermost bedrock in the main valleys of the Pecatonica River and Richland Creek, but it does not outcrop and is buried by many feet of alluvium.

Dolomite of both Ordovician and Silurian age contains varying amounts of interbedded chert, and the Maquoketa Shale is often interbedded with dolomite.

An interesting phenomenon reported by many early investigators and described recently by Doyle (*4*) is "ice-shove" areas, where large segments or blocks of dolomite were moved only short distances by glacial ice and have maintained their bedrock identity, even though in places the rock is badly broken. Such areas are common southeast and northeast of Freeport and between Cedarville and Dakota.

[1] Personal communication, W. Calhoun Smith, Illinois State Geological Survey.

This shallow to bedrock ridge (Section 12, T26N, R8E) is an example of an "ice-shove" area of limestone. (Fig. 2)

In places, as indicated in soil series descriptions and by the distribution of map units on the soil map sheets, bedrock is an important part of some soil profiles and has a significant effect on soil properties. The entire county was glaciated, but in some areas glacial drift is thin enough to be of little significance. Drift is considered to be less than 50 feet thick (*21*) in all of the county except in the Pecatonica River Valley and possibly other stream valleys. The former bedrock valleys are filled with thick deposits, but the uplands are covered by much smaller amounts.

The age and classification of tills in this area of Illinois have historically been very controversial. Most upland glacial deposits in Stephenson County are presently considered to be of the Illinoian Glacial Stage and related to the Green Bay Lobe. Some of the glacial deposits in the uplands south of the Pecatonica River in the eastern part of the county have been assigned to the Altonian Substage of the Wisconsinan Glacial Stage. According to Frye *et al.* (*8*), the area of Illinoian-age deposits was subjected to intense episodes of erosion by both water and wind when younger ice of the Woodfordian Substage of the Wisconsinan Stage was at its maximum extent to the south and east of Stephenson County. As a result, many areas of Illinoian till were nonuniformly eroded and truncated and now contain youthful and old soils together in the same landscape. A general understanding of geologic events in the area is necessary to the understanding of the characteristics and distribution of present-day soils.

When the Altonian Substage of the Wisconsinan Stage blocked the eastward flow of the Pecatonica River, a glacial lake named Lake Silveria existed for a time in the Pecatonica River and Yellow Creek Valleys (*11, 30*). Lake silts and stratified drift of Wisconsinan age are present in these valleys.

When the ice of the substages of the Wisconsinan Stage melted, large amounts of sediment filled the Mississippi River Valley. Following the retreat of the glaciers and during dry seasons, the fine sediments, largely of silt size, were blown from the valleys onto the uplands and formed a cover of varying thickness on the older deposits of glacial drift. In places, Roxana silts and occasional deposits of Robein silts occur as the lower part of the silty deposits. After the Woodfordian Substage of the Wisconsinan Stage melted, which took place outside the borders of Stephenson County, a rather extensive windblown silty deposit called Peoria Loess was added as the uppermost and dominant portion of the surficial silty deposits. On stable landscape positions (level to gently sloping ridgetops that are little affected by erosion) the silty or loess deposits range from about 7 to 13 feet thick in the western and southern part of the county, diminishing in a northeasterly direction to about 3 to 5 feet (*28, 30*). On more sloping sites, loess is thinner and, in some areas, absent.

The youngest significant sediments are the alluvial materials, mainly silty in texture, that have accumulated in the flood plains of the major streams.

Readers interested in the bedrock and glacial deposits and the glacial history of the county should consult publications of the Illinois State Geological Survey, many of which are referred to in this section.

Mineral Resources

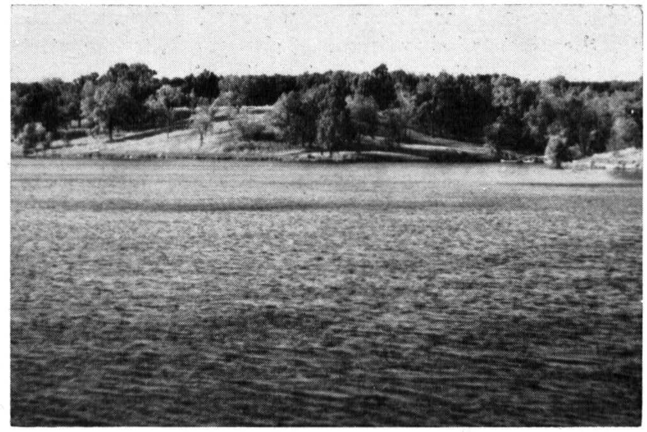
The most important mineral resource of the county is the dolomitic limestone bedrock, which is quarried, crushed, and used for agricultural limestone, construction, and road surfacing. In 1971 Stephenson County ranked 21st in production among the 67 stone-producing counties in Illinois (*3*).

Common sand and gravel are also important mineral resources produced from a few large and many small pits throughout the county. In 1971 Stephenson County ranked 50th in sand production and 36th in gravel production, considering all producing Illinois counties.

Abundant clay deposits occur as shale in the southwestern part of the county, but they all contain carbonates and are not well suited for brick, tile, or ceramic uses.

There are some interesting reports on early unsuccessful attempts in mineral exploration in the area. An early account by Shaw (*24*) reports an attempt to drill for oil near Cedarville in 1864 and describes a very short period of commercial mining of peat from a small area in Ridott Township. Shaw evaluated the county resources by writing, "The chief sources of wealth in Stephenson County are to be found in the richness and productiveness of its soil, and in its abundant agricultural resources."

Hershey in 1899 (*12*) reported on the very brief working of gold-bearing formations in two locations, one west of Eleroy and one west of Pearl City.



Lake Le-Aqua-Na in the state park north of Lena, as viewed from the dam. (Fig. 3)

Water Resources

The major streams in the county — Richland Creek, Yellow Creek, and Pecatonica River — are used to a minor extent for recreation. A few manmade lakes, such as Lake Le-Aqua-Na in the state park north of Lena, are used for small boats and fishing.

Water supplies for domestic, municipal, and industrial uses come from ground water in glacial deposits or in porous zones or crevices in bedrock formations. Glacial deposits in upland areas of the county are too thin in most places to bear large quantities of water. Buried sand and gravel deposits in the Pecatonica River Valley from about Freeport eastward, however, provide good to excellent aquifers. Similar deposits in the Pecatonica River Valley above Freeport and in the Yellow Creek Valley provide fair to good aquifers (*10*).

In southwestern Stephenson County, ground water is obtained from wells drilled into Silurian dolomite or occasionally into limestone or dolomite beds in Ordovician-age Maquoketa Shale. Wells relied upon for municipal and industrial demands, however, are usually drilled to sandstone-bearing formations of Ordovician age or deeper into sandstone aquifers of Cambrian age (*27*). Good domestic supplies can be obtained from dolomite formations at shallower depths than the sandstone.

Some water for livestock is provided by many flowing streams, a few springs, and manmade farm ponds.

Climate[1]

Stephenson County has the continental climate typical of northern Illinois. Summer maximum temperatures (°F.) in the middle 90's and winter minimum temperatures of about 15 to 20 degrees below zero give a wide annual temperature range, averaging about

[1] The authors are indebted to W. L. Denmark and D. E. Wuerch, former State Climatologists for Illinois, for information in this section.

115 degrees. Low pressure areas and their associated weather fronts bring frequent changes in temperature, humidity, cloudiness, and wind direction during much of the year.

Annual precipitation averages about 34 inches but has varied from as little as 20 inches to as much as 49 inches. About one year in five the annual precipitation is less than 29 inches and about equally as often is more than 38 inches. Winters are normally the driest part of the year; the monthly average is less than 1¾ inches for December through February. The wettest months are usually June, July, and August, with monthly averages of 4 inches or more. More than half the annual precipitation normally falls during the growing season of May through September (see Table 1).

Normal July and August rainfall alone is insufficient to meet the moisture demand of a vigorously growing field crop. Subsoil moisture must be stored during the previous fall through spring for good crop production during most growing seasons. Major drouths are infrequent, but rather prolonged dry periods during a portion of the growing season are not unusual. Such periods often result in reduced crop yields.

Summer precipitation occurs mostly in showers or thunderstorms of brief duration. A single thunderstorm often produces more than an inch of rain and is occasionally accompanied by hail or damaging wind. Nearly 5 inches of rain have fallen in a 24-hour period on several occasions.

Annual snowfall averages about 25 inches, and more than 20 inches have fallen in a single month on several occasions. During the winter of 1925-1926 measurable snow fell every month from October through April, totalling more than 68 inches.

Growing field crops are most likely to be damaged if hail falls during the months of June, July, or August. Thunderstorm days average about 45 annually, half of which occur during the critical growing period. Hail-producing storms in the same area average two a year, but less than one per year occurs during the critical

TABLE 1. TEMPERATURE AND PRECIPITATION DATA, 1931-1968[a]

Month	Temperature (°F.)					Inches of precipitation		
	Mean daily max.	Mean daily min.	Mean monthly	Record high	Record low	Mean monthly	Greatest daily amount	Mean monthly snowfall
January	29.7	11.6	20.6	60	−29	1.61	2.25	8.1
February	32.9	14.7	23.8	64	−26	1.08	1.85	5.5
March	43.7	24.6	34.1	82	−21	2.17	1.71	7.3
April	59.7	36.6	48.1	90	9	2.92	2.85	1.2
May	71.6	47.3	59.4	106	24	3.58	2.27	0.1
June	80.9	57.5	69.2	106	33	4.30	3.02	0
July	85.1	60.8	72.9	112	42	3.90	4.85	0
August	82.8	59.2	71.0	102	37	3.69	3.03	0
September	74.7	51.2	62.9	101	23	3.65	4.90	0
October	64.3	40.5	52.4	90	13	2.14	2.89	0.1
November	46.7	28.1	37.4	78	−14	2.30	3.72	2.4
December	33.2	16.7	24.9	64	−29	1.68	1.75	7.9
Year	58.8	37.4	48.1	112	−29	33.02[b]	4.90	32.6[b]

[a] Based on records at Freeport, Illinois, station.
[b] Mean total for year.

TABLE 2. FREEZE PROBABILITIES IN STEPHENSON COUNTY[a]

	Date when lowest temperature would be				
	32° F.	28° F.	24° F.	20° F.	16° F.
Last occurrence in spring					
Average date	May 5	Apr. 24	Apr. 14	Mar. 30	Mar. 19
25 percent chance after	May 14	May 3	Apr. 23	Apr. 8	Mar. 28
10 percent chance after	May 22	May 11	May 1	Apr. 16	Apr. 5
First occurrence in fall					
Average date	Oct. 4	Oct. 15	Oct. 27	Nov. 7	Nov. 18
25 percent chance after	Sept. 25	Oct. 6	Oct. 18	Oct. 29	Nov. 9
10 percent chance after	Sept. 18	Sept. 29	Oct. 11	Oct. 22	Nov. 2

[a] Freeze data are based on 1931-1960 records in a standard National Weather Service thermometer shelter at the height of approximately five feet above the ground and in a representative exposure. At times, temperatures will be lower nearer the ground or in local areas subject to extreme air drainage. Source: *17*.

growing period months. Not all hailstones produce stones of sufficient size or quantity to damage crops extensively (*14*).

Summers are warm, but hot periods are seldom prolonged. Cool air invasions from the north occur frequently enough, even in summer, to prevent stagnation of hot, humid air masses. July is normally the warmest month. Temperatures of 100° F. or higher occurred during 8 of 11 summers from 1931 through 1941. On the average, there are about 20 summer days a year with temperatures of 90° F. or higher. The highest recorded temperature was 112° F. on July 14, 1936, within a period of four consecutive days when temperatures reached 110° F. or more. During July, 1936, 13 days had temperatures of 100° F. or higher, and 12 of these days were consecutive.

January is normally the coldest month; February frequently has days as cold as January, but the cold periods are usually shorter. Temperatures of zero or below have been recorded every winter since 1931; the average winter minimum has been about −17° F. The coldest days recorded in this century were −29° F. on December 27, 1950, and January 30, 1951. Days with temperatures of zero or below average about 18 each winter, usually during the three winter months. Temperatures of −20° F. or colder have been recorded in all four months of December through March.

The number of days between the average date of the last freezing temperature (32° F. or below) in spring and the average date of the first freezing temperature in fall averages about 150 days in Stephenson County. This period is called the "growing season," but the term may be misleading since different crops have different temperatures at which growth is affected. Table 2 indicates the probability of several different threshold temperatures. Temperatures often vary considerably between ridge and valley locations during radiation freezes, the type most common in Illinois.

CULTURAL FEATURES OF STEPHENSON COUNTY

Organization and Population

Stephenson County was established by law on March 4, 1837, from lands that had been part of Jo Daviess County (since 1827) and Winnebago County (since 1836). The county was named for Col. Benjamin Stephenson, who had been a prominent pioneer, a colonel in the territorial militia, and Adjutant General of the Illinois Territory in 1813 and 1814.

Early trails across Stephenson County were the result of people trading furs with the Indians and traveling to the lead-mining areas in Jo Daviess County and southwestern Wisconsin. Many of the early settlers were miners and former soldiers who had traveled through the area and returned. Major troubles with the Indians ended in 1832 with the conclusion of the Blackhawk War. The last encounter of this war on Illinois soil was the Battle of Kellogg's Grove on June 25, 1832, in southwestern Stephenson County (*1*).

Although settlers had stayed in the county previously for short periods, the first permanent settler is considered to be William Waddams, who built his home near the present site of Waddams Grove in 1833 (*9*). In 1834 many new settlers came to the area, many of them from Pennsylvania, Ohio, New York, Maryland, Virginia, the Carolinas, Kentucky, and Tennessee. Eventually, settlers came to Stephenson County directly from Europe.

When the county was established in 1837, Freeport became the county seat. Until 1836 this settlement had been called Winneshiek, after a chief of the Winnebago Indians who had established a village at the site. One of the famous Lincoln-Douglas debates was held in Freeport (August 27, 1858).

Population increased rapidly after the county was established. The 1970 U.S. Census reported the population of the county was 48,861, an increase of 8,215 since 1940. The 1970 population of the major towns was Freeport, 27,736; Lena, 1,691; Cedarville, 578; Orangeville, 538; Pearl City, 535; Davis, 525; Dakota, 440; and Winslow, 330.

Transportation, Industry, and Other Developments

Facilities for transporting agricultural and industrial products are well developed in Stephenson County. Railroads and paved highways (one federal and three state) furnish the county with direct routes to major cities. Most secondary roads are surfaced with blacktop or crushed rock. The Freeport Municipal Airport, southeast of town, has facilities for private planes.

Industry is best developed in Freeport, but many of the smaller towns have some industry. Among these industries have been food manufacturing and processing (including milk and milk products), lumber and wood products, furniture and fixtures, chemicals, rubber and plastic products, primary metal industries, fabricated metal industries, machinery, electrical equipment and supplies, printing and publishing, stone and glass products, drugs, agricultural services, and others.

Highland Community College, a two-year junior college, was established in 1966 at Freeport. The new college assimilated the previously established Freeport Community College.

Agriculture

Agriculture is the major industry in Stephenson County, largely because of the high percentage of productive soils and the favorable climate. Agricultural production is also favored by good transportation

Stephenson County is the leading dairy county in the state. This contented herd of Holsteins is pastured in the bottomland along Cedar Creek. (Fig. 4)

facilities and the availability of local or nearby markets for many products.

The soils and sloping topography are well adapted to combination grain and livestock farming, and a high percentage of farm income is derived from livestock and livestock products. Cash-grain farming has increased, however, in recent years.

Following the general trends in Illinois, the total number of farms in the county has decreased, with a corresponding increase in the average farm size. In 1950 there were 2,543 farms, averaging about 136 acres per farm; according to the Agricultural Census of 1969, there were 1,776 farms, averaging about 187 acres each.

Corn and soybean acreage has increased in recent years, with a corresponding reduction in oat and hay acreage. In 1972, according to the Illinois Crop Reporting Service (*15*), the acreage and average yield per acre of major crops were corn (for grain), 129,000 acres at 108 bushels; soybeans, 13,100 acres at 33 bushels; oats, 20,300 acres at 53 bushels; and all hay, 52,100 acres at 3.5 tons. Small acreages of wheat, barley, and rye were harvested. The farm value of grain and hay in 1972 was approximately $25,713,200.

Dairy and beef cattle, hogs, sheep, and chickens are all important animal industries. Stephenson County is presently the leading county in the state in numbers of dairy cattle and total milk production. The farm value of all cattle, hogs, and sheep on farms in 1972 was approximately $29,405,900.

Modern farming methods and high management levels use large amounts of fertilizers, insecticides, and herbicides. According to the Agricultural Census of 1969, irrigation was practiced on only four farms on a total of 29 acres. Most areas that were naturally forested have been cleared, but some areas remain in native forest and are usually pastured. Areas that can be classified as woodland or woodland pasture occupy slightly less than 15,000 acres, according to 1969 Agricultural Census data. Slightly over 40,000 acres are used primarily for pasture and grazing, and about 277,000 acres are used for crop production.

GENERAL SOIL AREAS OF STEPHENSON COUNTY

The location and extent of the fifteen general soil areas or soil associations in Stephenson County are shown on the general soil map (page 135). A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil and is named for the major soils. Soils in one association may also occur in other associations but in different patterns.

A map showing soil associations is useful to people who want a broad picture of the soil resources in an entire county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a single farm or field, however, because the soils within any one association ordinarily differ in slope, depth, natural drainage, or other characteristics that are important in their management. Each of the fifteen soil associations in Stephenson County is discussed in the following pages.

View to northwest from top of high bedrock ridge near Waddams Grove. Off the ridge the nearly level to gently sloping soils are part of soil association A — mainly Tama, Muscatine, and Sable soils. (Fig. 5)

Area A — Tama-Downs-Muscatine Association — Nearly level to strongly sloping, dark- and moderately dark-colored, well-drained to somewhat poorly drained, upland and terrace soils developed from loess

Soil association A lies mainly to the northwest of Lena and to the northwest and southeast of Pearl City. This soil association also extends in a broken pattern southward from Freeport into Carroll and Ogle Counties and eastward into Winnebago County. Some isolated small areas lie about 5 to 10 miles to the north and to the northeast of Freeport. This soil association has a total area of about 67,600 acres and makes up 18.6 percent of the county.

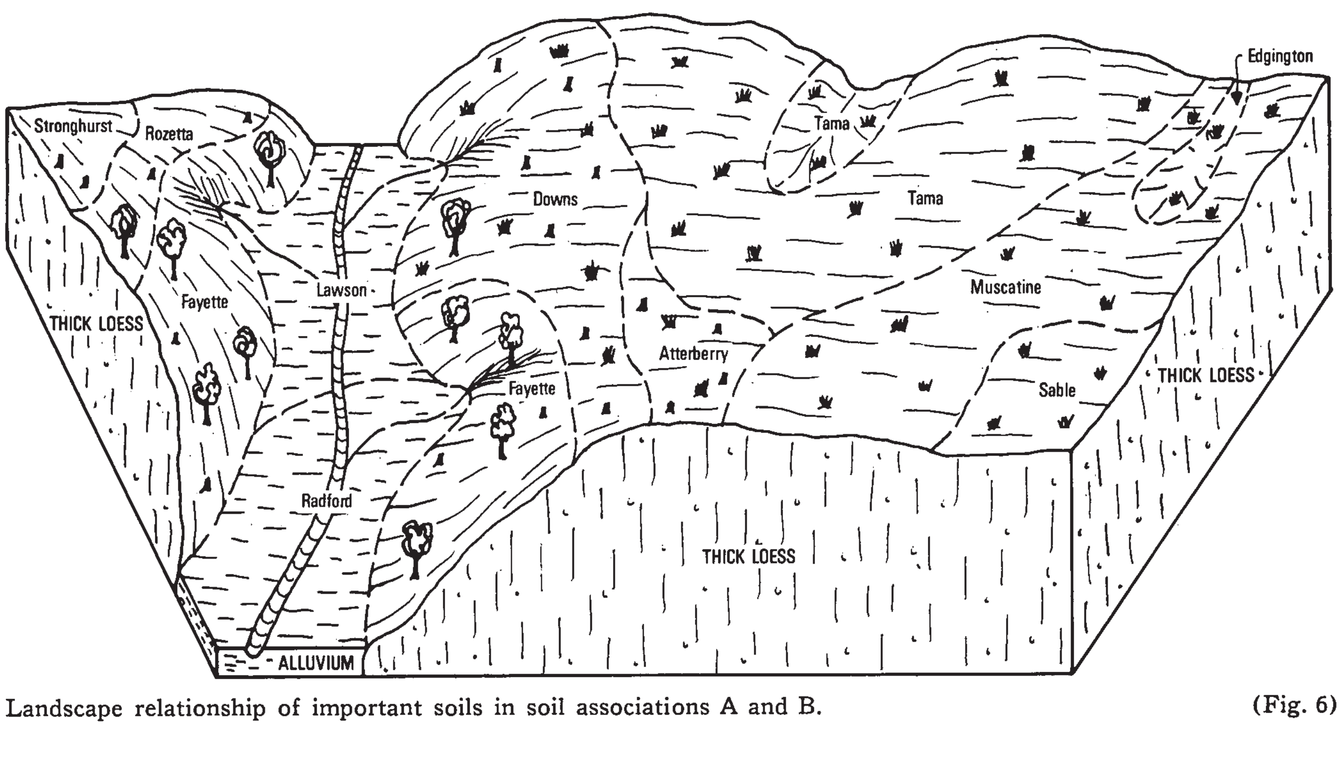
Uneroded Tama soils have predominantly dark silt loam surface layers. The subsoil extends from about 20 inches below the soil surface to about 55 inches below the surface. It is predominantly yellowish-brown silty clay loam. Mottles are usually present in the lower subsoil.

Uneroded Downs soils have predominantly moderately dark silt loam surface layers. The subsoil extends from about 15 inches below the soil surface to about 55 inches below. It is predominantly dark yellowish-brown silty clay loam. Mottles are usually present in the lower subsoil.

Muscatine soils have dark silt loam surface layers. The subsoil extends from about 18 inches below the surface to about 55 inches below. It is primarily grayish-brown silty clay loam and is strongly mottled.

Commonly, Tama and Downs soils lie on gently sloping to strongly sloping topography. In most areas, Downs soils lie between the darker colored Tama soils and the lighter colored Fayette soils. The somewhat poorly drained Muscatine soils lie mainly on nearly level topography.

Atterberry, Edgington, and Sable soils are the predominant minor soils in this association. In most places, the Atterberry soils occupy the more level landscapes adjacent to the better drained and more sloping Downs soils. Atterberry soils occupy nearly level landscapes similar to the darker colored Muscatine soils. In most places, the poorly drained Edgington soils lie in small



Landscape relationship of important soils in soil associations A and B. (Fig. 6) depressions enclosed by broad areas of Muscatine or Atterberry soils. Poorly drained Sable soils, in most areas, occupy lower positions next to the Muscatine soils. If outlets are available, tile will function satisfactorily on most of the minor soils.

Most of this association is used for cropland. Less than 5 percent of this area is used for permanent bluegrass pasture, woods, wildlife, or urban development. It is one of the most productive areas in the county. Mixed grain and livestock are the major types of farming. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn occupies the land about three years out of four. Water-erosion control is needed on sloping Tama and Downs soils. Tile will improve drainage of the Muscatine soils in most places.

Area B — Fayette-Rozetta Association — Nearly level to steep, light-colored, well- and moderately well-drained, upland and terrace soils developed from loess

Soil association B extends northwest in a broken pattern from Freeport to Waddams Creek. It also extends west intermittently from Freeport into Jo Daviess County in a band about 1 to 2 miles wide. Some isolated small areas lie just north of the Pecatonica River near Ridott and in the vicinity of Cedarville. This soil association has a total area of about 24,700 acres and makes up 6.8 percent of the county.

Uneroded Fayette soils have predominantly light-colored silt loam surface layers. The well-drained subsoils are yellowish-brown silty clay loam. Fayette soils commonly occupy gently sloping to steep areas in this soil association.

Rozetta soils have predominantly light-colored silt loam surface layers. The moderately well-drained silty clay loam subsoils are mostly yellowish brown in the upper part but mottled in the lower part. Rozetta soils lie mainly on nearly level to gently sloping ridgetops.

Stronghurst, Camden, Woodbine, Fishhook, and Atlas are the predominant minor soils in this association. In most places, the somewhat poorly drained Stronghurst soils occupy the more level landscapes adjacent to the better drained Rozetta and Fayette soils. Stronghurst soils occupy nearly level landscapes similar to the somewhat darker Atterberry soils. Where drainage is needed, tile will function adequately if there is an outlet. In areas occupied by Camden soils, the slopes are strongly to very strongly sloping, and the loess thickness over the glacial outwash or slope wash sediments is too thin to give rise to the loess-derived Fayette soils common to this association. Where Woodbine soils occupy the strongly to very strongly sloping areas, limestone bedrock lies at depths of about 3 to 5 feet. The loess thickness over the bedrock is too thin for the Fayette soils. If Woodbine soils are used for sewage disposal or water retention, the underlying bedrock will cause limitations. In areas occupied by Fishhook and Atlas soils, the landscape is moderately sloping to strongly sloping. Poorly drained, heavy-textured glacial sediments above depths of 50 inches have given rise to the Fishhook and Atlas soils. Because of the heavy-textured underlying drift, special management practices are needed on these soils. Commonly, in this association Fayette and Rozetta soils lie on the lesser sloping ridgetops. Where the loess thickness on the stronger slopes is too thin for the formation of Fayette soils, Camden, Woodbine, Fishhook, or Atlas soils commonly developed.

Most of this association is used for cropland. Less than 10 percent of this area is used for permanent pasture, woods, wildlife, or urban development. Dairy cattle and hogs are commonly raised in this area. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn is grown about half the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

Area C — Ogle-Myrtle-Durand Association — Gently sloping to strongly sloping, dark- and moderately dark-colored, well-drained, upland soils, developed partly in loess and partly in the underlying drift

Soil association C lies mainly in the northeastern part of the county, east of Richland Creek. Several small areas lie to the east of German Valley in the southeast corner of the county. This soil association has a total area of 28,100 acres and makes up 7.7 percent of the county.

Uneroded Ogle soils have predominantly dark-colored silt loam surface layers. The upper subsoil, developed in loess, commonly extends from about 12 inches below the surface to about 40 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in reddish drift, extends from about 40 inches below the surface to more than 60 inches below. It is mainly yellowish-red clay loam.

Uneroded Myrtle soils are very similar to Ogle soils but have moderately dark-colored silt loam surface horizons. The upper subsoil developed in loess and commonly extends from about 14 inches below the surface to about 40 inches below. It is mainly yellowish-brown silty clay loam. The lower subsoil developed in reddish drift and often extends to more than 60 inches below the surface. It is mainly yellowish-red clay loam.

Durand soils are like Ogle soils with respect to color and texture of surface and subsoil. The upper subsoil of Durand soils, developed in loess, commonly extends from about 12 inches below the surface to about 25 inches below. The lower subsoil, developed in reddish drift, extends from about 25 inches below to more than 50 or 60 inches below.

Ogle, Myrtle, and Durand soils occupy gently sloping to strongly sloping areas.

Argyle, Hitt, Parr, and Tama are the predominant minor soils in this association. Moderately dark Argyle soils lie between the Ogle and Durand soils of this association and the light-colored Flagg, Pecatonica, and Woodbine soils of soil associations D and G. Where limestone bedrock is within 50 inches of the surface, Hitt soils have formed; they commonly lie on sloping and strongly sloping areas adjacent to the Ogle and Durand soils that occupy the ridgetop. If Hitt soils are used for sewage disposal or water retention, the underlying bedrock will cause limitations. A few areas of Parr soils lie within this association on slopes commonly occupied by the Durand soils. Several areas of Tama soils lie on gently sloping ridgetops. Ordinarily, the Ogle soils predominate on the ridgetops, but in several places the loess thickness exceeded 60 inches and Tama soils were formed.

Most of this association is used for cropland. Less than 5 percent of this area is used for permanent pasture, woods, wildlife, or urban development. Dairy cattle and hogs are commonly found in this area. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn is grown about half the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

Area D — Flagg-Pecatonica Association — Gently sloping to strongly sloping, light-colored, well-drained, upland soils, developed partly in loess and partly in the underlying drift

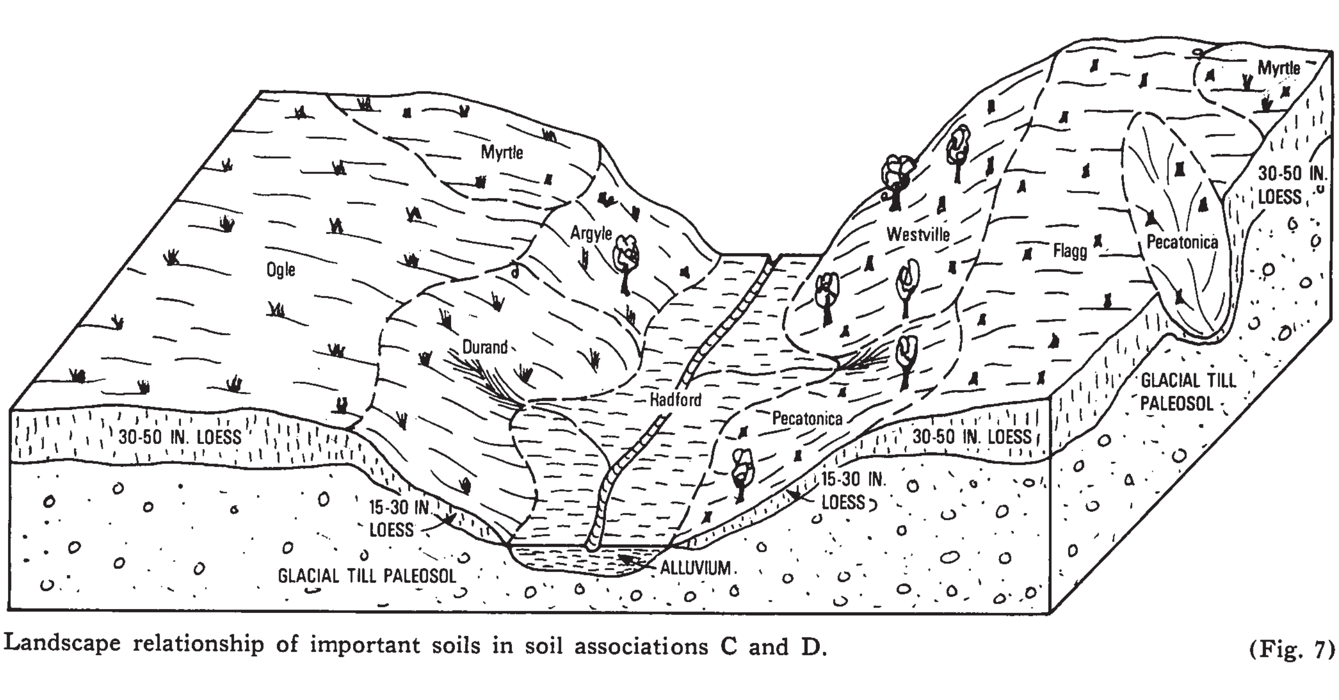
Soil association D lies mainly in the eastern part of the county, south of Rock City and north of the Pecatonica River. One large area occurs near Rock Grove. Scattered small areas occupy the landscape in other areas in the northern half of the county. This soil association has a total area of 13,200 acres and makes up 3.6 percent of the county.

Uneroded Flagg soils have predominantly light-colored silt loam surface layers. The upper subsoil, developed in loess, commonly extends from about 12 inches below the surface to about 40 inches below. It is mostly brown silty clay loam. The lower subsoil, developed in reddish drift, extends from about 40 inches below to more than 60 inches below. It is predominantly reddish-brown clay loam.

Pecatonica soils are like Flagg soils with respect to color and texture of surface and subsoil. The upper subsoil of Pecatonica soils, developed in loess, commonly extends from about 10 inches below the surface to about 20 inches below. The lower subsoil, developed in reddish drift, extends from about 20 inches below to more than 50 or 60 inches below.

Both Flagg and Pecatonica soils occupy gently sloping to strongly sloping areas.

Myrtle, Westville, Woodbine, Miami, and Fayette are the predominant minor soils in this association. These minor soils, in most places, occupy slopes similar to Flagg and Pecatonica soils. Myrtle soils are similar to Flagg but have moderately dark-colored surface horizons. Westville soils were formed on slopes where loess thickness was less than about 15 inches. In places, limestone bedrock is within 50 inches of the surface, and Woodbine soils have formed; they commonly occupy moderately sloping and strongly sloping areas adjacent to Flagg and Pecatonica soils that lie on the ridgetop. If Woodbine soils are used for sewage disposal or water retention, the underlying bedrock will cause limitations. A few areas of Miami soils lie within this association on slopes commonly occupied by the



Landscape relationship of important soils in soil associations C and D. **(Fig. 7)**

Pecatonica or Westville soils. Several areas of Fayette soils lie on gently sloping ridgetops. Ordinarily, the Flagg soils predominate on the ridgetops, but in several places the loess thickness exceeded 60 inches and Fayette soils were formed.

Most of this association is used for cropland. Less than 10 percent of this area is used for permanent pasture, woods, wildlife, or urban development. Dairy cattle and hogs are commonly raised in this area. Corn, oats, and alfalfa-brome hay are the principal crops grown, with corn and hay grown about two-thirds of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

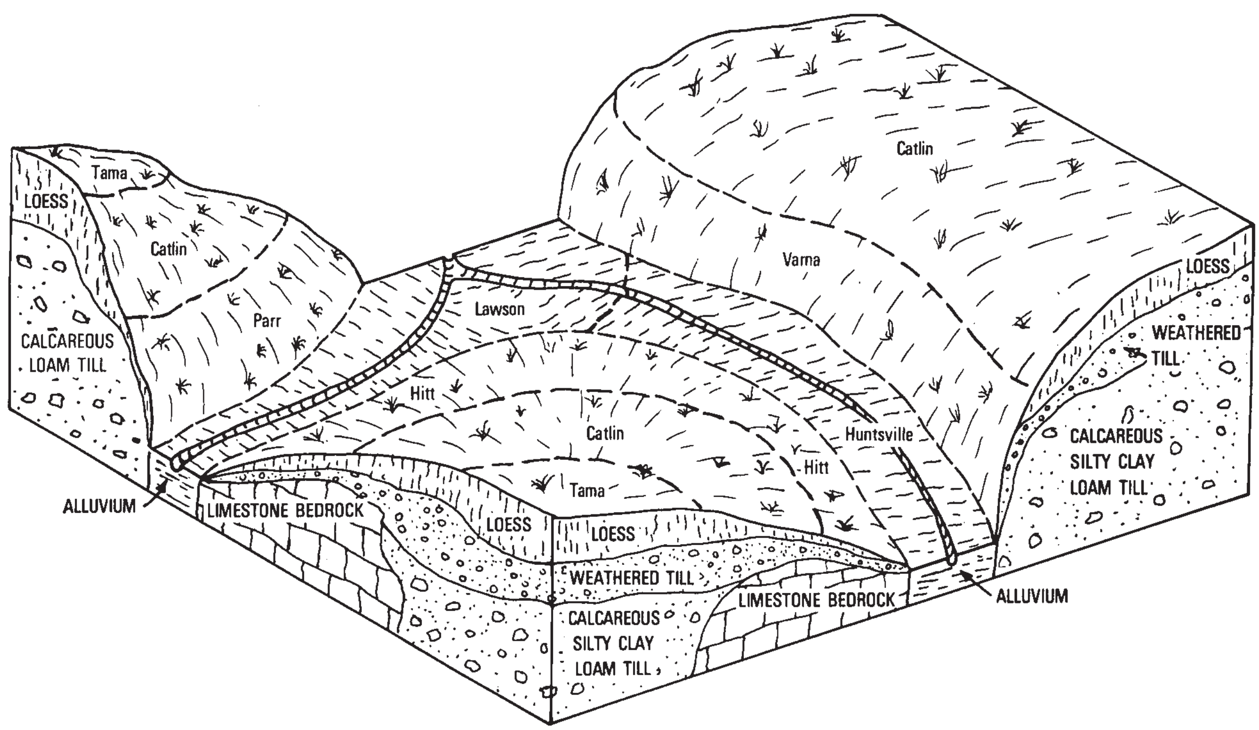
Area E — Catlin-Varna Association — Gently sloping to strongly sloping, dark-colored, well- and moderately well-drained, upland soils, developed partly in loess and partly in the underlying calcareous loam or silty clay loam till

Soil association E lies predominantly in the northwest corner of the county. Some small areas occur south of Pearl City, and one area lies just northeast of Baileyville. This soil association has a total area of 9,500 acres and makes up 2.6 percent of Stephenson County.

Uneroded Catlin soils have predominantly dark-colored silt loam surface layers. The upper subsoil, developed in loess, commonly extends from about 12 inches below the surface to about 40 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed mainly in silty clay loam till, extends from about 40 inches below to more than 55 inches below in most places. It is dark yellowish-brown silty clay loam to silty clay. Catlin soils occupy gently sloping to strongly sloping areas.

Varna soils are like Catlin soils with respect to color and texture of surface and subsoil. The upper subsoil of Varna soils, developed in loess, commonly extends from about 12 inches below the surface to about 20 inches below. The lower subsoil, developed in silty clay loam till, extends from about 20 inches below to about 40 inches below. Varna soils lie on moderately sloping to strongly sloping topography.

Parr, Hitt, and Tama are the predominant minor soils in this association. Parr soils lie mainly on moderately sloping to strongly sloping areas in Sections 28 and 33 of Silver Creek Township near Baileyville. Parr soils have formed from loam-textured till. Where limestone bedrock is within 50 inches of the surface, Hitt soils have formed, commonly lying on moderately sloping and strongly sloping areas adjacent to the Catlin soils that occupy the ridgetops. If Hitt soils are used for sewage disposal or water retention, the underlying bedrock will cause limitations. A few areas of Tama soils lie on the gently sloping ridgetops. In most places, Catlin soils predominate on the ridgetop, but in several areas the loess thickness exceeded 60 inches and Tama soils were formed.



Landscape relationship of important soils in soil association E. (Fig. 8)

Most of this association is used for cropland. Less than 10 percent of this area is used for permanent pasture, woods, wildlife, or urban development. Dairying is the major type of farming. Corn, oats, and alfalfa-brome hay are the principal crops grown, with corn and hay grown about two-thirds of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

Area F — Hitt-Dodgeville Association — Gently sloping to very strongly sloping, dark-colored, well-drained, upland soils, developed partly in loess, partly in the underlying drift, and partly in limestone bedrock

Soil association F lies mainly in the northeastern part of the county, east of Richland Creek. Several areas lie near German Valley in the southeast corner of the county. This soil association has a total area of 33,100 acres and makes up 9.1 percent of the county.

Uneroded Hitt soils have primarily dark-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 10 inches below the soil surface to about 20 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed primarily in reddish drift, extends from about 20 inches below the surface to about 40 inches below. It is mainly reddish-brown clay loam. Limestone bedrock lies below the lower subsoil.

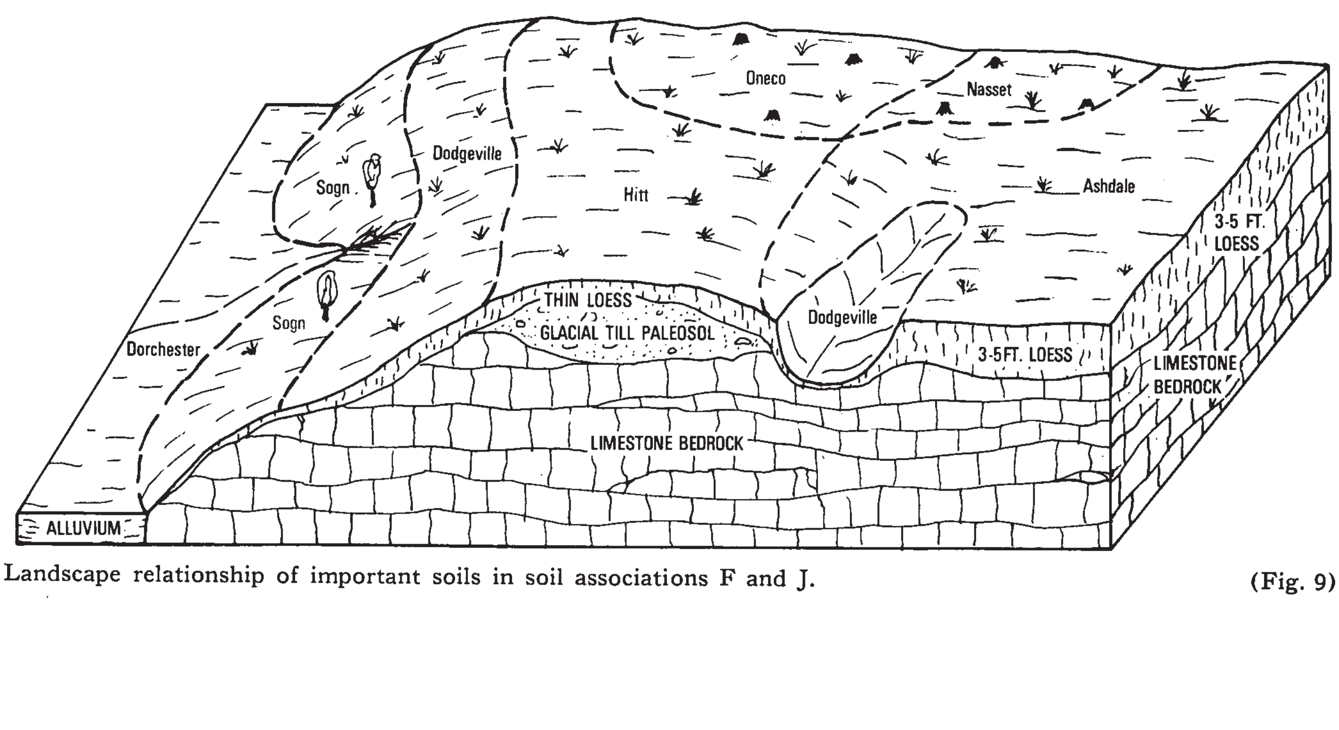
Uneroded Dodgeville soils have predominantly dark-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 12 inches below the soil surface to about 25 inches below. It is mostly dark brown silty clay loam. The lower subsoil is mainly reddish-brown silty clay to clay, a few inches thick. Limestone bedrock lies below the subsoil. In most places, Hitt soils occupy ridgetop positions and Dodgeville soils lie on the side slopes.

Oneco, Ashdale, and Sogn are the predominant minor soils in this association. Moderately dark Oneco soils lie between the Hitt soils and the light-colored Woodbine soils of soil association G. Ashdale soils, in most places, occupy gently sloping ridgetops or side slopes where significant glacial drift has not been present to form the Hitt soils. Sogn soils occupy very strongly sloping to very steep slopes and separate the upland Hitt or Dodgeville soils from adjacent bottomland soils.

Most of this association is used for cropland. Less than 10 percent of this area is occupied by permanent pasture, woods, wildlife, or urban development. Dairy cattle and hogs are commonly raised in the area. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn is grown about half the time. Water-erosion control is needed on sloping areas in cultivation. Under good management, most of this soil association produces good yields of the crops commonly grown. In places where limestone bedrock lies at or near the ground surface, yields decrease sharply.

Area G — Woodbine-Dubuque Association — Gently sloping to steep, light-colored, well-drained, upland soils, developed partly in loess, partly in the underlying drift, and partly in limestone bedrock

Soil association G lies intermittently adjacent to the bottomland soils of Richland and Brush Creeks. Other areas occupy positions adjacent to the bottomland soils of Rock Run, Brown, and Winneshiek Creeks. One large area lies in the northeast corner of the county,



Landscape relationship of important soils in soil associations F and J. (Fig. 9) in Rock Grove Township. This soil association has a total area of 16,200 acres and makes up 4.5 percent of the county.

Uneroded Woodbine soils have primarily light-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 10 inches below the surface to about 20 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed primarily in reddish drift, extends from about 20 inches below the surface to about 40 inches below. It is mostly reddish-brown clay loam. Limestone bedrock lies below the lower subsoil.

Uneroded Dubuque soils have predominantly light-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 10 inches below the surface to about 30 inches below. It is mostly yellowish-brown silty clay loam. A lower subsoil, a few inches thick, of reddish-brown silty clay to clay is usually present. Limestone bedrock lies below the subsoil.

In most areas, Woodbine soils occupy ridgetop positions and Dubuque soils lie on strongly sloping to steep slopes.

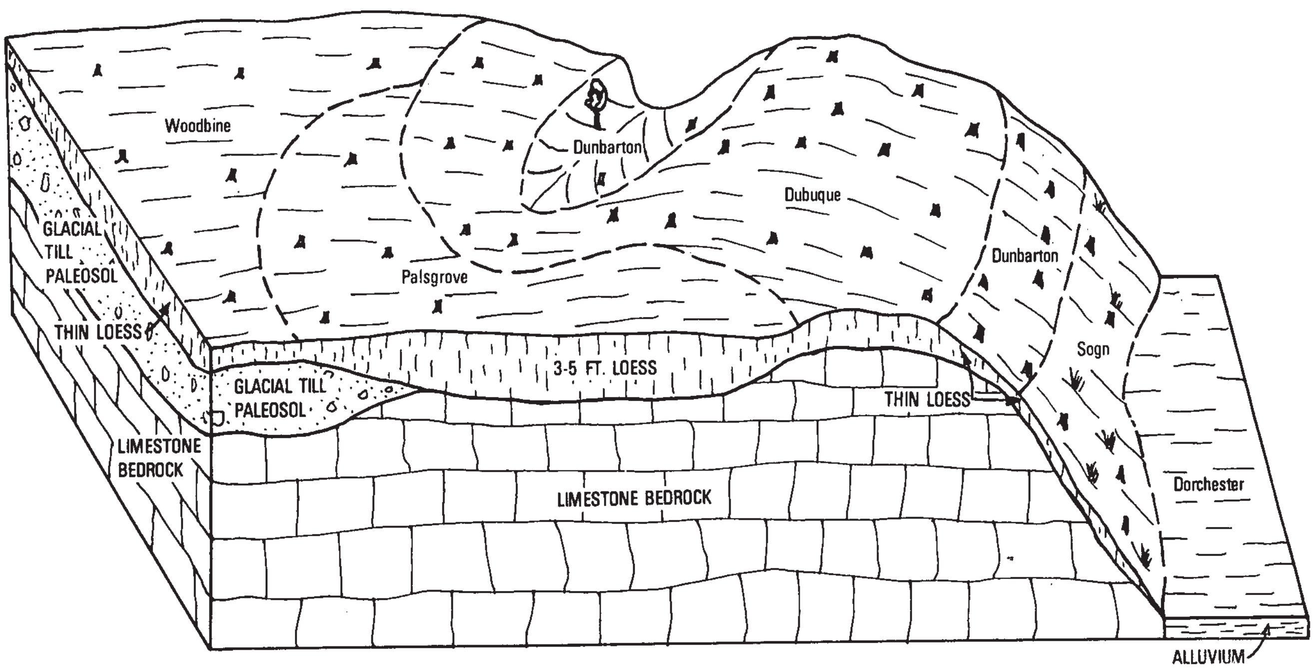
Dunbarton and Fayette are the predominant minor soils in this association. Dunbarton soils occupy side slope positions with the Dubuque soils on eroded and severely eroded, strongly sloping to steep slopes. Dunbarton soils are formed primarily in fine-textured residuum. On these steeper slopes, the loess thickness and depth to bedrock are variable. Dubuque and Dunbarton soils could not be accurately separated and were shown as a complex on the detailed soil map. A few areas of Fayette soils lie on gently sloping to moderately sloping ridgetops. In most places, Woodbine soils predominate on the ridgetop, but in several areas the loess thickness exceeded 60 inches and Fayette soils were formed.

Most of this association is used for cropland. About 10 percent of this area is used for permanent pasture, woods, wildlife, and urban development. Dairy cattle and hogs are commonly raised in the area. Corn, oats, and alfalfa-brome hay are the principal crops grown, with corn and hay grown about two-thirds of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, most of this soil association produces good yields of the crops commonly grown. In places where limestone bedrock lies at or near the ground surface, yields decrease sharply.

Area H — Plano-Hitt Association — Nearly level to strongly sloping, dark-colored, well- and moderately well-drained, upland soils, developed partly in loess, partly in the underlying drift, or partly in the limestone bedrock

Soil association H lies mainly in the southeastern part of the county just south of the Pecatonica River. One area lies just south of Cedarville. Some small areas are located near Freeport and others are several miles south of there. This soil association has a total area of 10,400 acres and makes up 2.9 percent of the county.

Uneroded Plano soils have predominantly dark-colored silt loam surface layers. The upper subsoil, developed in loess, extends from about 20 inches below the soil surface to about 50 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in medium-textured outwash, extends



Landscape relationship of important soils in soil associations G and K. **(Fig. 10)**

from about 50 inches below the surface to about 60 inches below. It is mostly yellowish-brown clay loam. Stratified loam, sandy loam, and sandy clay loam lie below the lower subsoil.

Uneroded Hitt soils have mainly dark-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 10 inches below the soil surface to about 20 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed mainly in drift, extends from about 20 inches below the surface to about 40 inches below. It is mostly dark brown clay loam. Limestone bedrock lies below the lower subsoil.

Commonly, Plano soils occupy the nearly level to gently sloping ridgetops, and the Hitt soils lie on the moderately sloping to strongly sloping areas.

Proctor, Tama, and Dodgeville are the predominant minor soils in this association. In most areas, Proctor soils lie on side slopes below the ridgetop Plano soils, where the loess thickness is too thin and the depth to bedrock too great to form either the Plano or Hitt soils. A few areas of Tama soils lie on the nearly level to gently sloping ridgetops. Commonly, Plano soils predominate on the ridgetops, but in several areas the loess thickness exceeded 60 inches and Tama soils were formed. Several areas of Dodgeville soils lie on moderately sloping to strongly sloping topography. In most places, Hitt soils occupy the side slopes, but in a few areas the limestone occurs within about 36 inches of the ground surface and the Dodgeville soils have formed.

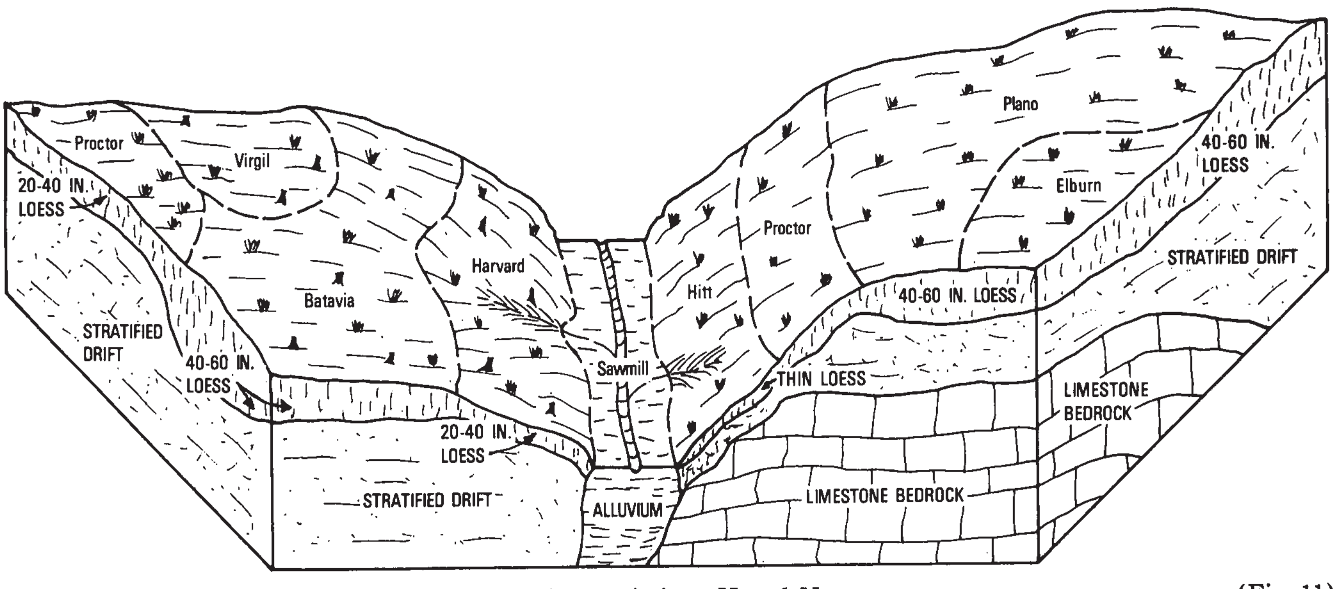
Most of this association is used for cropland. Less than 5 percent is occupied by permanent pasture, woods, wildlife, or urban development. Mixed grain and livestock are the major types of farming. Corn, oats, and alfalfa-brome hay are the main crops grown. Corn occupies the land about three years out of four. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

Area I — Camden-Woodbine Association — Gently sloping to very strongly sloping, light-colored, well- and moderately well-drained, upland and terrace soils, developed partly in loess, partly in the underlying drift, or partly in the limestone bedrock

Soil association I parallels the Pecatonica River on the east and north side, extending intermittently from Red Oak into Winnebago County in a band about 1 to 2 miles wide. On the west side of the Pecatonica River, it extends intermittently from Waddams Creek to Freeport in a band about 1 to 3 miles wide. One area parallels Yellow Creek, predominantly on the north side, from Freeport to the junction of Yellow and Lost Creeks. Small isolated areas lie elsewhere in the county. This soil association has a total area of 27,000 acres and makes up 7.4 percent of the county.

Uneroded Camden soils have predominantly light-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 12 inches below the surface to about 30 inches below. It is mainly dark yellowish-brown silty clay loam. The lower subsoil, developed in medium-textured outwash or erosional slope sediments, extends from about 30 inches below the surface to about 50 inches below. It is mostly brown clay loam.

Uneroded Woodbine soils have mainly light-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 10 inches below



Landscape relationship of important soils in soil associations H and N. **(Fig. 11)**

the surface to about 20 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed primarily in drift, extends from about 20 inches below the surface to about 40 inches below. It is mostly dark brown clay loam. Limestone bedrock lies below the lower subsoil.

No particular repeating soil pattern appears evident as to the occurrence of Camden and Woodbine soils in this association. Both soils lie on similar gently sloping to moderately steep topography.

Fayette, St. Charles, Miami, and Morley are the predominant minor soils in this association. A few areas of Fayette soils lie on gently to moderately sloping ridgetops. Where the loess thickness exceeded 60 inches, Fayette soils were formed on slopes normally occupied by either Camden or Woodbine soils. On some nearly level to sloping places, the loess thickness averaged 40 to 60 inches, over medium-textured outwash, and the St. Charles soils formed. Some moderately sloping to very strongly sloping areas are occupied by either the Miami or the Morley soils. The loess thickness on these soils is less than 20 inches in most places. Loam or silty clay loam drift lies at about 20 to 40 inches below the surface, and either Miami or Morley soils have formed.

Most of this association is used for cropland. Less than 10 percent of this area is used for permanent pasture, woods, wildlife, and urban development. Dairy cattle and hogs are commonly raised in the area. Corn, oats, and alfalfa-brome hay are the main crops grown, with corn and hay grown about two-thirds of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good yields of the crops commonly grown.

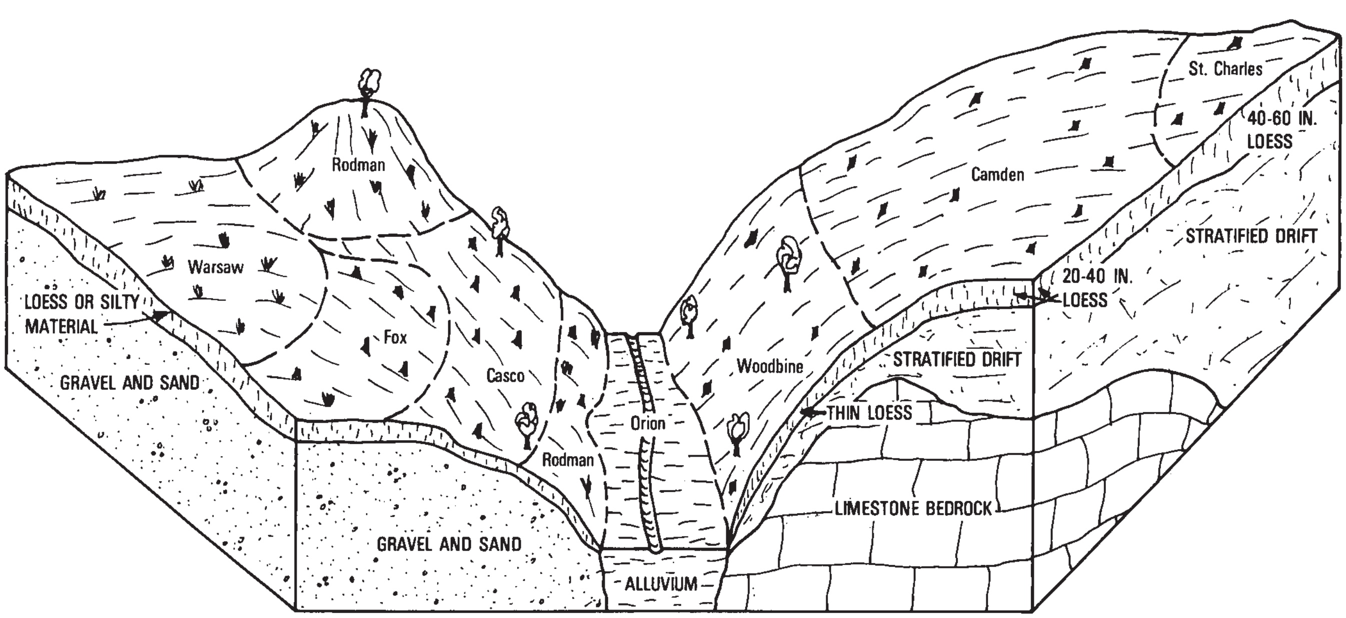
Area J — Dodgeville-Ashdale-Nasset Association — Gently sloping to very strongly sloping, dark- or moderately dark-colored, well-drained, upland soils, developed partly in loess and partly in limestone bedrock

Soil association J lies mainly in the northern part of the county, north of McConnell and west of Oneco. One area lies just east of Orangeville; another, just southwest of Winslow. Some areas lie near Davis, Pearl City, and Lena. This soil association has a total area of 16,700 acres and makes up 4.6 percent of the county.

Uneroded Dodgeville soils have predominantly dark-colored silt loam surface layers. The upper subsoil, commonly developed in loess, extends from about 12 inches below the surface to about 25 inches below. It is mostly dark brown silty clay loam. The lower subsoil is mainly reddish-brown silty clay to clay, a few inches thick. Limestone bedrock lies below the subsoil.

Uneroded Ashdale soils have primarily dark-colored silt loam surface layers. The upper subsoil, developed in loess, extends from about 15 inches below the surface to about 40 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in residuum, extends from about 40 inches below the surface to 50 inches below. It is reddish-brown silty clay to clay. Limestone bedrock lies below the subsoil.

Uneroded Nasset soils have mainly moderately dark-colored silt loam surface layers. The upper subsoil, developed in loess, extends from about 10 inches below the surface to about 40 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in residuum, extends from about 40 inches below the surface to 50 inches below. It is reddish-



Landscape relationship of important soils in soil associations I and M. (Fig. 12) brown silty clay to clay. Limestone bedrock lies below the subsoil.

In most places, Dodgeville soils occupy the moderately sloping to very strongly sloping side slopes; Ashdale or Nasset soils occupy the bedrock-controlled ridgetops. Nasset soils in most places lie between the dark-colored Ashdale soils and the light-colored Palsgrove soils of Area K.

Downs and Tama are the predominant minor soils in this association. In most places, either Ashdale or Nasset soils predominate on the ridgetops, but in several areas the loess thickness exceeded 60 inches and Tama or Downs soils were formed.

Most of this association is used for cropland. Less than 10 percent of this area is occupied by permanent pasture, woods, wildlife, or urban development. Dairying is the major type of farming. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn is grown about half the time. Water-erosion control is needed on sloping areas in cultivation. Under good management, most of this soil association produces good yields of the crops commonly grown. In places where limestone bedrock lies at or near the ground surface, yields decrease sharply.

Area K — Dubuque-Dunbarton-Palsgrove Association — Gently sloping to steep, light-colored, well-drained, upland soils, developed partly in loess and partly in limestone bedrock

Soil association K occupies mainly the northwestern and southwestern part of the county. These areas lie north and east of Lena and north of McConnell, paralleling the Pecatonica River. One area lies in the extreme northwest corner of Winslow Township. A small area is located about 2 to 3 miles northeast of Pearl City. One extensive area lies in Jefferson Township and is bordered mainly by the shale soils of Area L. This soil association has a total area of 21,300 acres and makes up 5.9 percent of the county.

Uneroded Dubuque soils have predominantly light-colored silt loam surface layers. The upper subsoil, primarily developed in loess, extends from about 10 inches below the surface to about 30 inches below. It is mostly yellowish-brown silty clay loam. A lower subsoil of reddish-brown silty clay to clay, a few inches thick, is usually present. Limestone bedrock lies below the subsoil.

Eroded Dunbarton soils have light-colored silt loam or silty clay loam surface layers. The subsoil, mostly developed in residuum, extends from about 6 inches below the surface to about 18 inches below. It is predominantly brown clay. Limestone bedrock lies below the subsoil.

Uneroded Palsgrove soils have primarily light-colored silt loam surface layers. The upper subsoil, developed in loess, extends from about 10 inches below the surface to about 35 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed in residuum, extends from about 35 inches below the soil surface to about 40 inches below. It is reddish-brown clay. Limestone bedrock lies below the subsoil.

Commonly, Palsgrove soils occupy the bedrock-controlled, gently sloping to moderately sloping ridgetops, and Dubuque and Dunbarton soils lie on the strongly sloping to steep side slopes. Dubuque and Dunbarton soils on eroded and severely eroded steeper slopes are shown as an undifferentiated unit on the detailed soil map.

Sogn is the predominant minor soil in this association. Sogn soils occupy very strongly sloping to very steep slopes, separating the upland Palsgrove, Dubuque, and Dunbarton soils from the adjacent bottomland soils.

About two-thirds of this soil association is used for cropland. Nearly one-third is used for permanent bluegrass pasture. Minor acreages are in woods and wildlife areas. Dairy and beef cattle farms are common in the area. Corn, oats, and alfalfa-brome hay are the main crops grown. Rotation hay occupies the cultivated land about two-thirds of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, Palsgrove soils produce good yields of the crops commonly grown. Dubuque and Dunbarton soils have limestone bedrock or residuum near the ground surface, reducing yields.

Area L — Eleroy-Derinda-Keltner Association — Gently sloping to moderately steep, light-colored and dark-colored, moderately well-drained, upland soils, developed partly in loess and partly in shale bedrock

Soil association L lies predominantly in the southwestern part of the county. One large area is south of Eleroy and another is south and west of Pearl City. One area lies on the ridge near Waddams Grove. Small isolated areas lie across the southern part of the county. Most of this association was formed under forest vegetation except those areas near the Ogle and northeastern Carroll County border. This soil association has a total area of 16,800 acres and makes up 4.6 percent of the county.

Uneroded Eleroy soils have primarily light-colored silt loam surface layers. The upper silty clay loam subsoil, developed in loess, extends from about 10 inches below the surface to about 40 inches below. It is yellowish brown and changes to grayish brown with depth. The lower subsoil, developed in shale, extends from about 40 inches below the surface to about 45 inches below. It is olive-brown silty clay with mottles. Calcareous shale bedrock with some limestone lies below the lower subsoil.

Eroded Derinda soils have light-colored silt loam or silty clay loam surface layers. The subsoil, developed in loess, extends from about 8 inches below the surface to about 20 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed in shale, extends from about 20 inches below the surface to about 25 inches below. It is mostly yellowish-brown silty clay with mottles. Calcareous shale bedrock with some limestone lies below the lower subsoil.

Uneroded Keltner soils have dark-colored silt loam surface layers. The upper silty clay loam subsoil, developed in loess, extends from about 15 inches below the soil surface to about 40 inches below. It is yellowish brown and changes to dark grayish brown with depth. The lower subsoil, developed in shale, extends from about 40 inches below the surface to about 45 inches below. It is olive-brown and greenish-gray clay. Calcareous shale bedrock, frequently interbedded with limestone, lies below the lower subsoil.

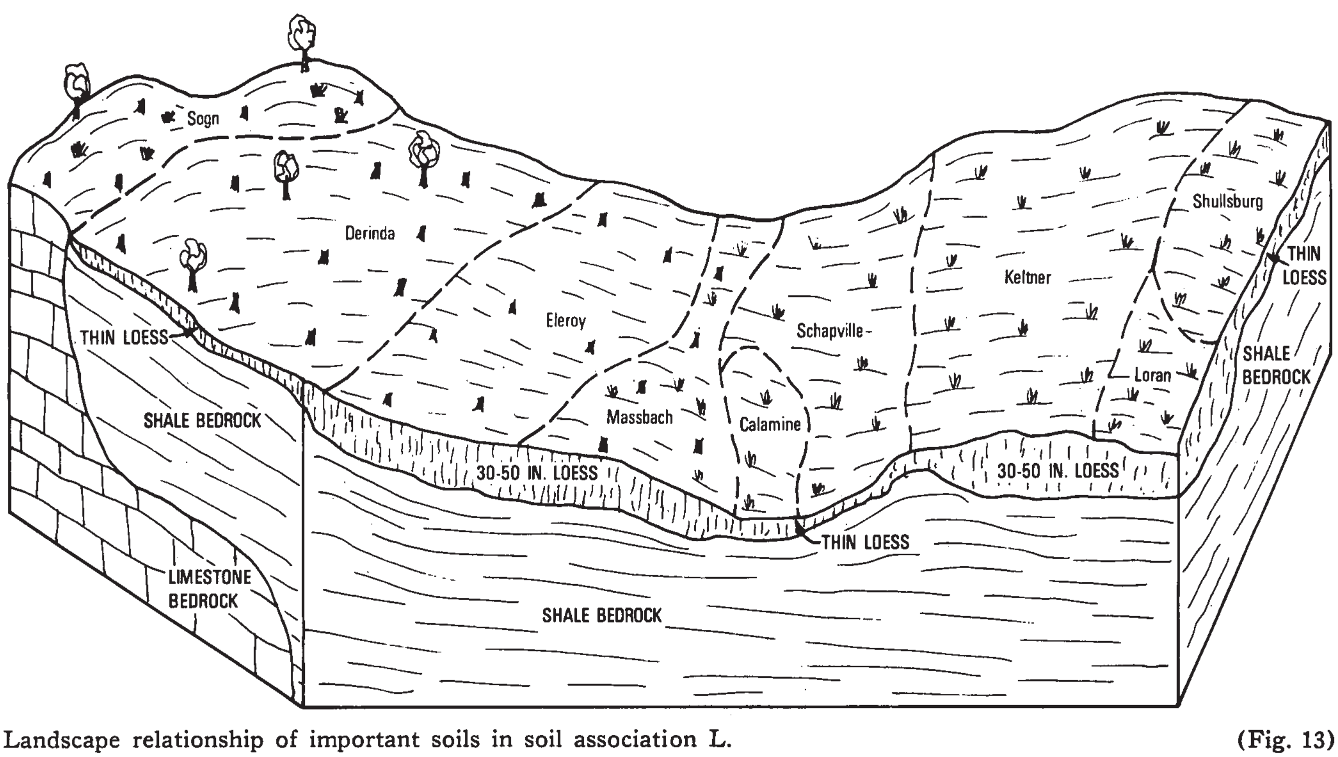
Commonly, Eleroy and Keltner soils occupy moderately sloping to strongly sloping positions directly below steep, distinctive limestone caps; Derinda soils commonly lie on very strongly sloping positions directly below the Eleroy and Keltner soils. In other places, the predictability of these soils is uncertain because of the variability of loess depth and the color and organic matter content of surface horizons.

Massbach, Schapville, and Shullsburg are the predominant minor soils in this association. Some areas of Massbach soils occupy positions common to the Eleroy and Keltner soils. In most places Massbach soils lie between the dark-colored Keltner and the light-colored Eleroy soils. Schapville soils are commonly associated with the Keltner soils. In some places, Schapville soils occur between higher lying Keltner soils and bottomland soils. In other positions, the loess thickness is naturally thin, resulting in the formation of Schapville soils. Shullsburg soils are somewhat poorly drained and commonly occupy low-lying positions in relation to the rest of the soils in this association. Because Shullsburg soils are naturally wetter than the associated soils, artificial drainage is needed in most places.

About three-fourths of this soil association is used for cropland. Nearly one-fourth is used for permanent bluegrass pasture. Minor acreages are in woods and support wildlife. Dairy and beef cattle are raised in the area. Corn, oats, and alfalfa-brome hay are the main crops grown. Rotation hay occupies the cultivated land about one-third of the time. Water-erosion control is needed on sloping areas in cultivation. Under proper management, Eleroy and Keltner soils produce good yields of crops commonly grown. Derinda soils have shale bedrock near the ground surface, reducing yields.

Area M — Casco-Fox-Warsaw Association — Moderately sloping to very strongly sloping, light-colored and dark-colored, well-drained, gravelly terrace or upland soils, developed primarily in calcareous gravel and sand

Soil association M lies mainly 3 to 4 miles north and east of Lena in Waddams and West Point Townships, with small isolated areas elsewhere; these areas were mostly developed under forest vegetation. Several other areas, formed mainly under prairie vegetation, lie just south of the Pecatonica River, southeast of Freeport. Upland kame and esker-like formations are included



Landscape relationship of important soils in soil association L. (Fig. 13) with terraces. This soil association has a total area of 2,400 acres and makes up 0.7 percent of the county.

Eroded Casco soils have light-colored loam surface layers. The brown clay loam subsoil extends from about 6 inches below the soil surface to about 15 inches below. Calcareous gravel and sand lie below the subsoil.

Eroded Fox soils have light-colored loam surface layers. The subsoil extends from about 6 inches below the soil surface to about 35 inches below. It is mostly brown clay loam and changes with depth to gravelly clay loam. Calcareous gravel and sand lie below the subsoil.

Eroded Warsaw soils have predominantly dark-colored loam surface layers. The subsoil extends from about 7 inches below the soil surface to about 35 inches below. It is mostly dark brown clay loam and changes with depth to gravelly clay loam. Calcareous gravel and sand lie below the subsoil.

No particular repeating soil pattern is evident as to the occurrence of these gravelly soils. The detailed soil maps indicate that Casco, Fox, and Rodman soils lie on the landscape in a complex manner and are not separated. Although Warsaw soils appear by themselves on the detailed map, small acreages of other gravel soils are present with them.

Rodman and Camden are the predominant minor soils in this association. Rodman soils have very thin loamy surfaces over calcareous gravel and sand. In most areas, Rodman soils lie on slopes in a complex with Casco soils. A few areas of Rodman soils occupy slopes within the boundaries of the Casco-Fox complex. Several areas of Camden soils occupy positions common to the gravel soils. These areas are underlain mainly by medium-textured material, but coarse-textured outwash probably occurs below.

About three-fourths of this association is used for permanent bluegrass pasture. Nearly one-fourth is cropland. Minor acreages are in woods and wildlife areas. Dairying is the major type of farming. Corn, oats, and alfalfa-brome hay are the main crops grown. Rotation hay occupies the cultivated land about three-fourths of the time. Water-erosion control is needed on areas in cultivation. Because the underlying gravel is rapidly permeable, this soil association will be drouthy in most years. Yields cannot be expected to be high unless the crop receives above-average rainfall.

Area N — Plano-Batavia-Proctor Association — Nearly level to strongly sloping, dark- and moderately dark-colored, moderately well-drained, terrace and upland soils, developed partly in loess and partly in the underlying medium-textured deposits

Soil association N lies predominantly south of Yellow Creek from Pearl City to Freeport and south of the Pecatonica River east of Freeport. Minor areas lie adjacent to many bottomland soils throughout the county. This soil association has a total area of 27,600 acres and makes up 7.6 percent of the county.

Uneroded Plano soils have predominantly dark-colored silt loam surface layers. The upper subsoil, developed in loess, extends from about 20 inches below the surface to about 50 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in medium-textured outwash, extends from about 50 inches below the surface to about 60 inches below. It is mostly yellowish-brown clay loam. Stratified loam, sandy loam, and sandy clay loam lie below the lower subsoil.

Batavia soils have moderately dark silt loam surface layers. The upper subsoil, developed in loess, extends from about 12 inches below the surface to about 45 inches below. It is mostly dark yellowish-brown silty clay loam. The lower subsoil, developed in medium-textured outwash, extends from about 45 inches below the surface to about 50 inches below. It is mostly brown clay loam. Stratified sandy loam, clay loam, and silt loam lie below the lower subsoil.

Uneroded Proctor soils have predominantly dark-colored silt loam surface layers. The upper subsoil, developed in silty material, extends from about 12 inches below the surface to about 24 inches below. It is mostly dark brown silty clay loam. The lower subsoil, developed in medium-textured outwash, extends from about 24 inches below the surface to about 40 inches below. It is mainly brown to dark grayish-brown clay loam with mottles. Stratified silt loam, loam, and silty clay loam lie below the lower subsoil.

Plano, Batavia, and Proctor soils occupy similar topography. In most places, Plano soils occupy the nearly level to gently sloping areas. Proctor soils lie on moderately sloping to strongly sloping areas, separating Plano soils from the bottomland soils. In a few places, Proctor soils occupy the more level positions common to the Plano soils. Batavia soils, in most places, lie between the dark-colored Plano and the light-colored St. Charles soils.

Elburn, Virgil, and Harvard are the predominant minor soils in this association. Elburn and Virgil soils are somewhat poorly drained. These soils would benefit from artificial drainage in most places. Elburn and Virgil soils occupy nearly level positions below Plano, Batavia, and Proctor soils in most areas. A few areas of Harvard soils occupy slopes common to the major soils in this association. Harvard soils, in most places, lie between the dark-colored Proctor and the light-colored Camden soils.

Most of this association is used for cropland. Less than 5 percent is occupied by permanent pasture, woods, wildlife, or urban development. Mixed grain and livestock are the major types of farming. Corn, oats, and alfalfa-brome hay are the principal crops grown. Corn occupies the land about three years out of four. Water-erosion control is needed on sloping areas in cultivation. Under proper management, this soil association produces good crop yields.

Area O — Lawson-Radford-Sawmill Association — Nearly level, dark-colored, somewhat poorly and poorly drained, silty bottomland soils

Soil association O lies mainly adjacent to the Pecatonica River from Wisconsin through Stephenson County into Winnebago County. Smaller areas finger into all the tributary valleys and side branches of the valleys. This soil association has a total area of 48,920 acres and makes up 13.4 percent of the county.

Lawson soils are predominantly black silt loam from the surface to about 30 inches deep. A few mottles are present below the plow layer and increase in number with depth. Below 30 inches the soil is very dark gray silt loam; many mottles are present. This grayer material extends to more than 60 inches below the surface.

Radford soils are predominantly black silt loam from the surface to about 30 inches deep. Below 30 inches the soil is black silty clay loam; some mottles are present. This layer extends to about 50 inches below the surface. Dark gray stratified silt loam, loam, and silty clay loam lie below 50 inches.

Sawmill soils are predominantly black silty clay loam from the surface to about 25 inches deep. Below 25 inches the soil is olive-gray silty clay loam; some mottles are present. This layer extends to about 45 inches below the surface. Gray mottled silt loam extends from about 45 inches below the surface to more than 60 inches below.

Commonly, Lawson or Radford soils occupy the flood plains of the narrow creek bottomlands. Some areas of Lawson lie on the broader flood plains of the Pecatonica River. Sawmill soils, in most places, occupy abandoned sloughs or lie adjacent to the Pecatonica River.

Huntsville, Dorchester, and Otter are the predominant minor soils in this association. Huntsville soils lie mainly on the Pecatonica River flood plain. They occupy predominantly the highest elevations on the flood plain and are bordered by more poorly drained Lawson or Radford soils. Dorchester soils, in most places, are somewhat poorly or moderately well drained; they are the dominant soils in the flood plain of the East Plum River in Jefferson Township. Other small areas of Dorchester soils occur on the Pecatonica River flood plain. Otter soils occupy low-lying or depressional areas on the Pecatonica River flood plain. Many areas have no outlet and the soil remains quite wet or is ponded for long periods. Otter soils are silt loam and occupy positions common to those occupied by the silty clay loam Sawmill soils.

Most of this soil association is used for growing corn. Permanent bluegrass pasture makes up about 15 percent of the association. Minor acreages of oats and alfalfa-brome hay are grown. Corn and livestock are raised extensively in the area. Because the water table is high during part of the year, tile drainage is needed in most places. There is a flood hazard on this association because the flood plains are not protected by levees and soils in the upland are not adequately treated by conservation measures in many places.

DESCRIPTIONS OF STEPHENSON COUNTY SOILS

The soil series are described and discussed in alphabetical order in this section except for some of the complexes. A representative profile description for each of the soil series is given. The profile characteristics are for an extensive mapping unit, usually a unit that has not been altered a great deal by erosion. If the series has additional mapping units, these are listed by the symbols that also are shown on the soil map sheets. The explanation of slope and erosion symbols (page 1) indicates how other mapping units differ from the unit used as the representative profile. Information on general occurrence, formation, relationship to other soils, and special properties is given for each series.

The horizon designations used in the profile descriptions are discussed on page 1 and in the Glossary on page 126.

In the profile descriptions, Munsell color notations and consistence are for moist soils. The color notations refer to soil color standards developed by the Munsell Color Company, Inc. The notations consist of three variables: hue, value, and chroma. In the notation 10YR 3/2, for example, the hue is denoted by 10YR (YR = yellow-red), the value by 3, and the chroma by 2. Hue is the dominant spectral (rainbow) color and is related to the dominant wave length of light. Value refers to the relative lightness of color and is a function of the total amount of light. Chroma is the relative purity or strength of the spectral color.

The names of the mapping units are given in the Guide to Mapping Units (pages 129 to 132), in which series are arranged in numerical order. The area of each mapping unit and each series is given in Table 4.

To aid the readers' understanding of the similarities and differences among the many soil series, Table 3 arranges the soil series according to parent materials, surface color (which is related to native vegetation), degree of B horizon development, and natural drainage class.

Argyle Series (227)

The Argyle series consists of deep, moderately dark-colored, well- and moderately well-drained soils developed partly in loess 15 to 30 inches thick and partly

TABLE 3. — STEPHENSON COUNTY SOILS: Arranged by Parent Materials, Surface Color, Degree of Development, and Natural Soil Drainage

Parent material of soil profile	Soil assoc. area	Surface color	Degree of B horizon development	Natural drainage class[a] and soil series[b]
Loess 5 ft. or more thick; calcareous below 42 in., usually below 60 in.	A	Dark	Moderate	W, MW–Tama (36); SP–Muscatine (41); P–Sable (68), Edgington (272)
	A, B	Mod. dark	Moderate	W, MW–Downs (386); SP–Atterberry (61)
	B	Light	Moderate	W–Fayette (280); MW–Rozetta (279); SP–Stronghurst (278)
Approx. 30 to 50 in. of loess over leached loam, sandy loam, and gravelly drift; sola more than 4 ft. thick.	C	Dark	Moderate	W–Ogle (412)
	C, D	Mod. dark	Moderate	W–Myrtle (414)
	D	Light	Moderate	W–Flagg (419)
Approx. 15 to 30 in. of loess over leached loam, sandy loam, and gravelly drift; sola more than 4 ft. thick.	C	Dark	Moderate	W, MW–Durand (416)
	C, D	Mod. dark	Moderate	W, MW–Argyle (227)
	D	Light	Moderate	W, MW–Pecatonica (21)
Less than 15 in. of loess over leached sandy loam and gravelly drift; sola more than 4 ft. thick.	D	Light	Moderate	W, MW–Westville (22)
Approx. 20 to 40 in. of loess over leached and gleyed glacial drift; sola more than 5 ft. thick.	C	Dark	Moderate	SP–Keller (970)
	D	Light	Moderate	SP–Fishhook (971)
Less than 20 in. of loess over leached and gleyed glacial drift; sola more than 5 ft. thick.	C	Dark	Moderate	SP, P–Coatsburg (970)
	D	Light	Moderate	SP, P–Atlas (971)
Less than 18 in. of loess over loam glacial till; calcareous at less than 42 in.	C	Dark	Moderate	W–Parr (221)
	C, D	Mod. dark	Moderate	W–Octagon (656)
	D	Light	Moderate.	W–Miami (27)
Approx. 40 to 60 in. of loess over loam or silty clay loam glacial till; calcareous below 4 to 5 ft.	C, E	Dark	Moderate	W, MW–Catlin (171)
	D, E	Light	Moderate	W, MW–Birkbeck (233)
Less than 18 in. of loess over silty clay loam glacial till; calcareous at less than 4 ft.	E	Dark	Moderate	W, MW–Varna (223)
	D, E	Light	Moderate	W, MW–Morley (194)
Less than 15 in. of loess over sandy loam glacial till; calcareous at less than 40 in.	C	Dark	Moderate	W–Griswold (363)
	D	Light	Moderate	W–Kidder (361)
Approx. 40 to 60 in. of loess over limestone bedrock.	J	Dark	Moderate	W–Ashdale (411)
	J, K	Mod. dark	Moderate	W–Nasset (731)
	K	Light	Moderate	W–Palsgrove (429)
Approx. 40 to 60 in. of loess and glacial drift over limestone bedrock.	F, H	Dark	Moderate	W–Hitt (506)
	F, G, H	Mod. dark	Moderate	W–Oneco (752)
	G, I	Light	Moderate	W–Woodbine (410)
Approx. 20 to 40 in. of loess over limestone bedrock.	J	Dark	Moderate	W–Dodgeville (40)
	K	Light	Moderate	W–Dubuque (29, 973)
Less than 20 in. of loess over limestone bedrock.	K	Dark and mod. dark	Weak to none	W, S Ex-Sogn (504)
	K	Light	Moderate	W–Dunbarton (973)
Approx. 30 to 50 in. of loess over shale bedrock.	L	Dark	Moderate	W, MW–Keltner (546); SP–Loran (572); P, VP–Calamine (746)
	L	Mod. dark	Moderate	W, MW–Massbach (753); SP–Ridott (743)
	L	Light	Moderate	W, MW–Eleroy (547)
Less than 30 in. of loess over shale bedrock.	L	Dark	Moderate	W, MW–Schapville (418); SP–Shullsburg (745); P, VP–Calamine (746)
	L	Light	Moderate	W, MW–Derinda (417)
Approx. 40 to 60 in. of loess or silty material over stratified, medium-textured, water-laid deposits.	N	Dark	Moderate	W, MW–Plano (199); SP–Elburn (198)
	N	Dark	Weak	P–Drummer (152); Harpster (67)
	N	Mod. dark	Moderate	W, MW–Batavia (105); SP–Virgil (104); P–Thorp (206)
	I	Light	Moderate	W, MW–St. Charles (243); SP–Kendall (242)

[a] Natural drainage classes are abbreviated as follows: Ex = Excessive, S Ex = Somewhat Excessive, W = Well, MW = Moderately Well, SP = Somewhat Poor, P = Poor, VP = Very Poor.
[b] Includes one variant: Dorchester, cobbly subsoil variant (578).

(continued on next page)

TABLE 3 (continued).

Parent material of soil profile	Soil assoc. area	Surface color	Degree of B horizon development	Natural drainage class[a] and soil series[b]
Approx. 20 to 40 in. of loess or silty material over stratified, medium-textured, water-laid deposits.	N	Dark	Moderate	W, MW–Proctor (148)
	N	Mod. dark	Moderate	W, MW–Harvard (344); SP–Millbrook (219); P–Thorp (206)
	I	Light	Moderate	W, MW–Camden (134)
Dominantly sandy loam sediments over sand, mainly on terraces.	N	Dark	Weak	S Ex, W–Dickinson (87)
Thin silty or loamy sediments over gravel and sand; usually calcareous by 1 to 4 ft.	M	Dark	Weak to none	Ex–Rodman (969)
	M	Dark	Moderate	W–Warsaw (290)
	M	Light	Moderate	S Ex, W– Casco (969, 972); W–Fox (972)
Deep, silty, slightly acid to neutral alluvium on stream flood plains.	O	Dark	None	W, MW–Huntsville (77); SP–Lawson (451); P–Otter (76)
	O	Light	None	SP–Orion (415)[c]
Deep, silty or loamy, calcareous alluvium on stream flood plains.	O	Dark	None	P–Millington (82)
	O	Dark and mod. dark	None	MW, SP–Dorchester (239, 578)
Silty clay loam, neutral alluvium on stream flood plains.	O	Dark	None	SP–Radford (74); P–Sawmill (107)
Deep deposits of organic matter; calcareous, usually containing snail shells.	N, O	Dark	None	VP–Lena (210)
Deep deposits of organic matter; neutral.	N, O	Dark	None	VP–Houghton (103)

[a] Natural drainage classes are abbreviated as follows: Ex = Excessive, S Ex = Somewhat Excessive, W = Well, MW = Moderately Well, SP = Somewhat Poor, P = Poor, VP = Very Poor.
[b] Includes one variant: Dorchester, cobbly subsoil variant (578).
[c] Orion (415) has buried dark-colored alluvium at 20 to 40 inches.

in glacial till in areas where mixed prairie-forest vegetation has dominated.

Argyle occurs on gently sloping upland ridgetops and ranges to strongly sloping areas. Soil development progressed in the glacial till prior to loess deposition. Developed profiles are normally greater than 4 feet thick. Included with Argyle are a few areas on steeper slopes where the loess cover is less than 15 inches thick.

Argyle soils have moderate permeability and a high available water capacity.

The four mapping units shown on the soil map are 227B, 227C, 227C2, and 227D2. The moderately eroded mapping units have lost about one-half of their original surface soil or A horizons.

Argyle silt loam representative profile (227C)

Ap (0-7″) Very dark brown (10YR 2/2) silt loam; moderate, medium, granular structure; friable; abrupt, smooth boundary; pH 6.7.

A2 (7-12″) Dark grayish-brown (10YR 4/2) silt loam with light gray (10YR 7/1) silt coatings when dry and some organic coatings and channel fillings of very dark grayish brown (10YR 3/2); weak, medium, crumb structure; friable; clear, smooth boundary; pH 6.6.

B1t (12-17″) Dark brown (10YR 3/3 and 4/3) light silty clay loam with common, light gray (10YR 7/1) silt coatings when dry and common, very dark grayish-brown (10YR 3/2) organic coatings; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 6.5.

B21t (17-25″) Dark brown and dark yellowish-brown (10YR 4/3 and 4/4) silty clay loam with light gray (10YR 7/1) silt coatings when dry and discontinuous clay coatings and channel fillings of very dark brown (10YR 2/2); moderate, fine and medium, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

IIB22t (25-36″) Yellowish-red and reddish-brown (5 YR 5/6 and 4/4) clay loam with few, light gray (10YR 7/2) silt coatings when dry; patchy dark reddish-brown (5YR 3/2) clay coatings on horizontal and vertical ped faces and few, fine, black (N 2/0) iron-manganese stains; weak to moderate, medium, subangular and angular blocky structure; firm; clear, smooth boundary; pH 5.5.

IIB23t (36-53″) Strong brown (7.5YR 5/6) clay loam with patchy dark reddish-brown (5YR 3/2) clay coatings and few, fine, black (N 2/0) iron-manganese stains; weak, medium to coarse, angular blocky structure; firm; clear, smooth boundary; pH 6.0.

IIC (53-100″ +) Brown to yellowish-brown (10YR 5/3 to 5/6) loam till (sandy loam in upper 5 inches); massive; friable; calcareous; moderate effervescence.

Ashdale Series (411)

The Ashdale series consists of dark-colored, well-drained soils developed under grass vegetation from about 3 to 5 feet of loess over dolomitic limestone. There is usually a thin residuum layer at the surface of the dolomite.

Ashdale occurs commonly on loess-mantled ridgetops with the associated Dodgeville (40) soils on the slopes. Slopes range from gently to strongly sloping. In areas of thicker loess, Ashdale occurs on dominantly sloping positions and Tama (36) occurs on the ridgetops.

This landscape north of Oneco is occupied by dark-colored soils developed in loess and dolomitic bedrock that generally occurs at less than 5 feet. Ashdale soils occupy the ridgetops and gentle side slopes, and Dodgeville soils occur on the steeper side slopes. (Fig. 14)

Ashdale soils are deep; they have moderate permeability and a moderate available water capacity.

The four mapping units shown on the soil map are 411B, 411C, 411C2, and 411D2. The moderately eroded mapping units have lost about one-half of their original A horizons.

Ashdale silt loam representative profile (411B)

Ap (0-7") Black (10YR 2/1) silt loam; moderate, fine and medium, granular structure; friable; abrupt, smooth boundary; pH 7.3.

A12 (7-10") Black (10YR 2/1) silt loam; moderate, medium and coarse, granular structure; friable; clear, smooth boundary; pH 7.3.

A3 (10-15") Very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; some black (10YR 2/1) coats; clear, smooth boundary; pH 7.3.

B21t (15-23") Brown (10YR 4/3) silty clay loam; moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

B22t (23-33") Dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; firm; thin, discontinuous brown (10YR 4/3) clay films; clear, smooth boundary; pH 5.8.

B23t (33-43") Dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; firm; thin, continuous brown (10YR 4/3) clay films; clear, smooth boundary; pH 5.8.

IIB3t (43-51") Reddish-brown (5YR 4/4) silty clay to clay; weak, coarse, angular blocky structure; very firm; thin, continuous dark reddish-brown (5YR 3/4) clay films; abrupt, smooth boundary; pH 6.5.

R (51" +) Brownish-yellow and yellow (10YR 6/6 and 7/6) dolomitic limestone bedrock; calcareous.

Atterberry Series (61)

The Atterberry series consists of somewhat poorly drained, moderately dark-colored soils developed entirely in loess parent material in areas where loess generally exceeds 5 feet in thickness. They have developed under mixed prairie-forest vegetation, mainly in upland positions but occasionally also in terrace positions.

These soils occupy nearly level to gently sloping areas and are associated with Downs (386) and Rozetta (279), which occur in the better drained landscape positions. Atterberry soils are darker colored than Stronghurst (278) soils and lighter colored than Muscatine (41) soils, with which they are also associated.

Atterberry soils are deep; they have moderate to moderately slow permeability and very high available water capacity.

Two mapping units are shown on the soil map: 61A and 61B.

Atterberry silt loam representative profile (61A)

A1 (0-8") Very dark gray (10YR 3/1) silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; abundant roots; pH 7.3.

A21 (8-14") Dark grayish-brown (10YR 4/2) silt loam; weak, fine, platy structure; very friable; clear, smooth boundary; common roots; pH 6.0.

A22 (14-18") Brown (10YR 5/3) silt loam; weak, fine, platy structure; very friable; clear, smooth boundary; few roots; pH 5.5.

B1t (18-23") Pale brown (10YR 6/3) light silty clay loam; common, medium, distinct dark yellowish-brown (10YR 4/4) mottles; weak, fine and medium, subangular blocky structure; friable; clear, smooth boundary; few roots; pH 6.0.

B21tg (23-28") Light brownish-gray (10YR 6/2) silty clay loam; common, medium, prominent dark yellowish-brown (10YR 4/4) mottles; moderate, medium and coarse, subangular blocky structure (tends towards prismatic); friable; clear, smooth boundary; few manganese concretions; pH 6.0.

B22tg (28-34") Gray (10YR 6/1) silty clay loam; common, medium, prominent dark yellowish-brown (10YR 4/4) mottles; moderate, medium, prismatic structure; firm; gradual, smooth boundary; few manganese concretions; pH 6.0.

B23tg (34-44") Gray (10YR 5/1) silty clay loam; common, medium, prominent yellowish-brown (10YR 5/6) mottles; very dark brown (10YR 2/2) root channel fillings and thin, discontinuous clay coats; moderate, coarse, prismatic structure; firm; gradual, smooth boundary; common manganese concretions; pH 6.5.

B3tg (44-64") Gray (10YR 6/1) heavy silt loam; common, medium, prominent yellowish-brown (10YR 5/6) mottles; fewer root channel fillings and clay coats than in above horizon; weak, very coarse, prismatic structure; friable; gradual, smooth boundary; common manganese concretions; pH 7.5.

C1g (64-75") Gray to light gray (N 6/0) silt loam; yellowish-brown (10YR 5/8) mottles; pH 7.8.

C2 (75" +) Calcareous silt loam.

Batavia Series (105)

The Batavia series is made up of moderately dark-colored, well- and moderately well-drained soils in transitional prairie-forest areas developed from 3 to 5 feet of loess or silty material over stratified, medium-textured, water-laid sediments.

These soils occur on terrace benches along the major streams and also in upland areas where loess-covered outwash occurs. They occupy slopes ranging from 1 to 7 percent. Batavia soils have a darker colored surface horizon than St. Charles (243) soils, lighter colored or thinner surface horizons than Plano (199) soils, and better natural drainage than Virgil (104) soils, with which they are associated.

Batavia soils are deep; they have moderate permeability and high to very high available water capacity.

In mapping, some areas were included that have the solum developed entirely in silty material; they are very similar to the Downs (386) soils.

Three mapping units are shown on the soil map, differing mainly in the slope on which the soil occurs. They are 105A, 105B, and 105C. Included in the 105C unit are a few areas where a portion of the A horizons has been eroded away and the plow layer includes small amounts of B horizon.

Batavia silt loam representative profile (105B)

Ap (0-9″) Very dark grayish-brown (10YR 3/2) silt loam; weak, medium and coarse, granular structure; friable; abundant roots; pH 7.0; abrupt, smooth boundary.

A2 (9-12″) Dark grayish-brown (10YR 4/2) to brown (10YR 5/3) silt loam; weak, medium, granular structure; firm; plentiful roots; wormcasts and channel fillings of very dark grayish brown (10YR 3/2); light gray (10YR 7/1 to 7/2) silt coatings when dry; pH 7.0; clear, smooth boundary.

B1 (12-17″) Dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, fine, subangular blocky structure; firm; plentiful roots; occasional very dark grayish-brown (10 YR 3/2) channel fillings; silt coatings of light gray (10YR 7/1 to 7/2) when dry; pH 6.0; clear, smooth boundary.

B21t (17-25″) Dark yellowish-brown (10YR 4/4) silty clay loam; moderate to strong, fine, subangular blocky structure; firm; plentiful roots; few light gray (10YR 7/1 and 7/2) silt coatings when dry; few very dark grayish-brown (10 YR 3/2) and dark yellowish-brown (10YR 3/4) clay films; pH 5.6; clear, smooth boundary.

B22t (25-30″) Brown (10YR 5/3) silty clay loam; moderate to strong, fine and medium, subangular blocky structure; firm; few roots; few light gray (10YR 7/1 and 7/2) silt coatings when dry; moderately thick, discontinuous dark brown (10YR 4/3) clay films; pH 5.6; clear, smooth boundary.

B23t (30-45″) Brown (10YR 4/3 and 5/3) light silty clay loam with few, fine, distinct very dark brown (10YR 2/2) and dark brown (7.5YR 4/4) mottles; moderate, medium, angular and subangular blocky structure; firm; few roots; numerous light gray (10YR 7/1 and 7/2) silt coatings when dry; pH 5.8; clear, smooth boundary.

IIB3t (45-50″) Brown (10YR 5/3) and dark yellowish-brown (10YR 4/4) clay loam with few, medium, distinct very dark brown (10YR 2/2) and few, fine, faint pale brown (10 YR 6/3) and dark brown (7.5YR 4/4) mottles; weak, medium and coarse, angular blocky structure; firm; few roots; few light gray (10YR 7/1 and 7/2) silt coatings when dry; pH 6.2; clear, smooth boundary.

IIC (50-60″ +) Stratified yellowish-brown (10YR 5/4 and 5/6) sandy loam, dark yellowish-brown (10YR 3/4) clay loam to sandy clay loam, and brown (10YR 5/3) and pale brown (10YR 6/3) silt loam with common, fine, distinct dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; massive; friable; small amount of gravel; pH 6.4.

Birkbeck Series (233)

The Birkbeck series consists of light-colored, well- and moderately well-drained soils developed in 3 to 5 feet of loess over silty clay loam and loam-textured glacial till. Developed under forest vegetation, primarily oak and hickory, they occur on slopes ranging from 2 to 12 percent.

These soils occupy ridgetop positions associated with Morley (194) and Miami (27) soils on side slopes. Birkbeck also occurs on side slopes where a 3- to 5-foot loess mantle is present. Most of the Birkbeck soils in Stephenson County are underlain by silty clay loam till. Included on the soil map are a few areas, uncommon for this series, where carbonates have been leached to depths greater than 5 feet.

Birkbeck soils are deep; they have moderate permeability and high available water capacity.

Three mapping units are shown on the soil map: 233B, 233C2, and 233D2. The moderately eroded units have lost enough surface soil so that a little of the B horizon is mixed with the plow layer.

Birkbeck silt loam representative profile (233B)

A1 (0-3″) Very dark gray (10YR 3/1) silt loam; moderate, medium, crumb structure; friable; clear, smooth boundary; pH 7.0.

A21 (3-6″) Dark grayish-brown (10YR 4/2) silt loam; weak and moderate, very thin to thin, platy structure; friable; clear, smooth boundary; pH 6.5.

A22 (6-11″) Brown and dark brown (10YR 4/3) silt loam; moderate, medium, crumb structure; friable; clear, smooth boundary; pH 6.3.

B1t (11-17″) Dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, fine and medium, subangular blocky structure; friable; clear, smooth boundary; pH 6.0.

B21t (17-27″) Yellowish-brown (10YR 5/4) silty clay loam; few, fine, very dark brown (10YR 2/2) iron-manganese concretions; moderate, fine and medium, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

B22t (27-41″) Brown (10YR 4/3 and 10YR 5/3) silty clay loam; common, medium, prominent strong brown (7.5YR 5/8) and yellowish-red (5YR 4/6 and 4/8) mottles; thin, continuous grayish-brown (2.5Y 5/2) coatings over all ped surfaces; compound moderate, fine, prismatic and medium, angular blocky and subangular blocky structure; firm; clear, smooth boundary; few, fine, iron stains in upper part of horizon and iron-manganese concretions in the lower part; pH 6.8.

IIB23t (41-48″) Brown and strong brown (7.5YR 5/5) silty clay loam to clay loam; common, fine, very dark brown (10YR 2/2) iron-manganese concretions; brown and dark brown (7.5YR 4/3) thin, patchy clay coats over vertical surfaces; weak, medium and coarse, angular blocky structure; firm; abrupt, smooth boundary; igneous and limestone pebbles present; pH 7.5.

IIC (48″ +) Mixed strong brown (7.5YR 5/6), brown (7.5YR 5/4 and 10YR 5/3), and yellowish-brown (10YR 5/6) gritty silty clay loam; weak, medium and coarse, angular blocky structure; very firm; igneous and limestone pebbles present; calcareous; slightly effervescent.

Calamine Series (746)

The Calamine series is made up of dark-colored, poorly and very poorly drained soils developed from a thin loess cover (approximately 1 to 3 feet thick) over calcareous, fine-textured shale or slope wash from shale areas.

They have developed under marsh grasses and possibly sedges in nearly level to gently sloping areas, especially in foot slope positions where seepage occurs. The B slope designation on Calamine mapping units indicates an average range of 1 to 3 percent. They are restricted to those areas of the county where shale bedrock occurs at shallow depths.

Calamine soils are deep and have high available water capacity. Permeability is moderate in the upper part of the profile but very slow in the lower part.

In Stephenson County the Calamine soils are of minor extent; they vary greatly in the thickness of the loess cover and of the solum. They are associated with Shullsburg (745), Loran (572), Schapville (418), and Keltner (546) soils, which are derived from similar materials but have better natural drainage.

Only one mapping unit, 746B, is shown on the soil map. Included in it are a few level areas and an area in the center of the south one-half of Section 32, T26N, R7E (Florence Township), that includes slopes up to 5 or 6 percent.

Calamine silt loam representative profile (746B)

A11 (0-6″) Black (N 2/0) silt loam; moderate, fine, granular structure; friable; clear, smooth boundary; pH 6.8.

A12 (6-16″) Black (10YR 2/1) light silty clay loam; moderate, fine and medium, granular structure; friable; clear, smooth boundary; pH 6.5.

AB (16-20″) Very dark gray (10YR 3/1) silty clay loam; few, fine, distinct yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; friable; clear, smooth boundary; few iron-manganese concretions; pH 6.8.

B21tg (20-24″) Dark gray (N 4/0) heavy silty clay loam; common, fine and medium, distinct yellowish-brown (10 YR 5/4 and 5/6) mottles; common, very dark grayish-brown (2.5Y 3/2) iron-manganese concretions; moderate, fine and medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.8.

IIB22tg (24-36″) Dark grayish-brown (2.5Y 4/2) silty clay; common, medium, distinct light olive-brown (2.5Y 5/4 to 5/8) mottles; moderately thick, discontinuous dark gray (N 4/0) clay coatings over all ped surfaces; black (N 2/0) iron concretions; compound moderate, fine, prismatic and moderate, medium, angular blocky structure; very firm; clear, smooth boundary; pH 7.5.

IIB3tg (36-43″) Grayish-brown (2.5Y 5/2) and light olive-brown (2.5Y 5/6) silty clay loam to silty clay; common, medium, distinct strong brown (7.5YR 5/6 and 5/8) mottles; thin, patchy dark gray (N 4/0) clay coats on vertical surfaces; black (N 2/0) iron-manganese concretions and stains; moderate, medium, angular blocky structure; firm; clear, smooth boundary; calcareous; slightly effervescent.

IIC (43″ +) 50-percent greenish-gray (5GY 6/1) and 50-percent mixed light olive-brown (2.5Y 5/6) and yellowish-brown (10YR 5/6) silty clay to clay shale bedrock; few, fine, faint black (N 2/0) iron-manganese stains and concretions; light gray (10YR 7/1) streaks and spots; massive, with tendency to weak, coarse, angular blocky structure; extremely firm; calcareous; slightly effervescent.

Camden Series (134)

The Camden series is composed of light-colored, well- and moderately well-drained soils developed from less than 40 inches of loess or silty sediments over stratified, medium-textured, water-laid deposits.

These soils occur on stream terraces and in upland outwash and slope wash areas where forest, primarily oak and hickory, was the original vegetation. Developed profiles are normally at least 3½ feet thick. Camden occurs in association with Harvard (344), Batavia (105), and St. Charles (243) soils.

Camden soils are deep and moderately permeable. They have high available water capacity.

Camden occurs on slopes ranging from 2 to 18 percent. Six mapping units are shown on the soil map.

Camden silt loam representative profile (134B)

Ap (0-7″) Dark grayish-brown (10YR 4/2) silt loam mixed with pale brown (10YR 6/3) in lower 3 inches; weak, fine, platy to moderate, fine, crumb structure; friable; abrupt, smooth boundary; pH 6.5.

A2 (7-14″) Pale brown (10YR 6/3) silt loam, gray (10 YR 7/2) when dry; few root channels of dark grayish brown (10YR 4/2); strong, fine, platy structure; friable; clear, smooth boundary; pH 7.0.

B1 (14-20″) Yellowish-brown (10YR 5/4) light silty clay loam with numerous white (10YR 8/1) silt coatings when dry; moderate, very fine to fine, subangular blocky structure; firm; clear, smooth boundary; pH 7.3.

B21t (20-31″) Dark yellowish-brown (10YR 4/4) silty clay loam with nearly continuous clay coatings of dark grayish brown and dark brown (10YR 4/2 and 4/3); white (10YR 8/1) silt coatings when dry; strong, fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.5.

IIB22t (31-37″) Brown (7.5YR 4/4 and 10YR 5/3) clay loam, with discontinuous clay coatings of dark brown (10YR 4/3); white (10YR 8/1) silt coatings when dry; few, fine, distinct mottles of black (10YR 2/1) and reddish brown (5YR 4/3); moderate, medium, angular and subangular blocky structure; firm; clear, smooth boundary; pH 5.0.

IIB3t (37-52″) Dark brown to dark yellowish-brown (7.5YR 4/4 and 10YR 4/4) sandy clay loam with patchy clay coatings of dark brown (7.5YR 4/3); white (10YR 8/1) coatings on sand grains when dry; few, fine, distinct mottles of black (10YR 2/1) and yellowish red (5YR 4/6 and 5/6); moderate, medium, angular blocky structure; firm; clear, smooth boundary; pH 5.3.

IIC1 (52-66″) Mixed strong brown (7.5YR 5/6), brown (10YR 5/3), and yellowish-brown (10YR 5/6) stratified silt loam and loam; massive; friable; gradual, smooth boundary; pH 5.8.

IIC2 (66″ +) Mostly yellowish-brown (10YR 5/5) silt loam with few black (10YR 2/1) spots and yellowish-brown (10YR 5/8) streaks; massive; friable; calcareous, containing lime concretions.

Other mapping units are:

134C

134C2 Some mixing of B horizon in plow layer.

134D2 Some mixing of B horizon in plow layer.

134D3 Plow layer occurs in yellowish-brown silty clay loam B horizon.

134E2 Some mixing of B horizon in plow layer.

Casco-Fox Complex (972)

Casco-Fox complex occurs in small areas in a scattered pattern in the county. Several small areas are present north and east of Lena in Waddams and West Point Townships.

The Casco and Fox series are made up of light-colored, well-drained soils developed under forest vegetation on slopes ranging from about 4 to 18 percent. Natural drainage of Casco soils ranges to somewhat excessively drained. Casco soils are developed in less than 2 feet of silty or loamy sediments over calcareous gravel, and Fox soils are developed in 2 to 3½ feet of silty or loamy sediments over calcareous gravel. In their area of occurrence, the depth to the underlying gravel is extremely variable, and the two series are so intermingled that their separation on the soil map is impractical.

Both of these soils have moderate permeability. Fox has moderate available water capacity, and Casco has low available water capacity.

Some areas included in the mapping have sandy loam surface textures, especially in Section 36, T27N, R8E (Lancaster Township). Other areas also included were deeper than 3½ feet to calcareous gravel; they contained a large amount of rounded, brown chert, which is not normal for these soils.

The three mapping units shown on the soil map are 972C2, 972D2, and 972E2. The representative profiles described are from areas where A horizon thickness is near maximum. Most cultivated areas include some mixing of B horizon in the plow layer. Casco soils also occur as a complex with Rodman soils (969).

Casco silt loam representative profile (part of 972D2)

Ap (0-8″) Dark grayish-brown (10YR 4/2) gritty silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 7.0.

B2t (8-16″) Brown (7.5YR 4/3 to 4/4) clay loam with few, patchy clay coatings of dark brown (7.5YR 4/2); moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

IIC (16-60″ +) Very pale brown and brownish-yellow (10YR 7/4 and 6/6) gravel and dark yellowish-brown (10YR 4/4) sand; single grained; loose; calcareous, with weak effervescence. Mainly gravel of relatively high dolomite content but some chert and igneous pebbles.

Fox silt loam representative profile (part of 972D2)

A1 (0-2″) Very dark gray (10YR 3/1) gritty silt loam; weak, fine, crumb structure; friable; pH 6.2; clear, smooth boundary.

A2 (2-8″) Dark grayish-brown (10YR 4/2) gritty silt loam; strong, thin, platy structure; friable; pH 5.8; clear, smooth boundary.

B1 (8-11″) Brown (7.5YR 5/4) gritty heavy silt loam with thick, continuous coatings of dark grayish brown (10 YR 4/2); moderate, fine, subangular blocky structure; slightly firm; pH 5.1; clear, wavy boundary.

B21t (11-14″) Dark brown (7.5YR 4/4) clay loam; thin, continuous dark brown (7.5YR 3/4) clay films; few oxide specks (10YR 3/1); moderate, medium, subangular blocky structure; firm; pH 5.2; clear, smooth boundary.

B22t (14-23″) Brown (7.5YR 4/4) clay loam; thin, continuous dark brown (7.5YR 3/4) clay films; moderate, medium, angular blocky structure; firm; pH 5.1; clear, smooth boundary.

B31t (23-29″) Brown (7.5YR 4/4) fine gravelly clay loam; thin, continuous dark brown (7.5YR 3/2) clay films and few oxide specks (10YR 2/1); moderate, medium to fine, angular blocky structure; firm; pH 6.0; gradual, smooth boundary.

IIB32 (29-35″) Dark brown (7.5YR 3/2) mixed with very dark brown (7.5YR 2/2) gravelly clay loam; moderate, medium, angular blocky structure; slightly firm when moist, sticky when wet; pH 7.0; abrupt, irregular boundary.

IIC1 (35-43″) Brown (7.5YR 4/4) sand and gravel; single grained; loose; calcareous; clear, wavy boundary.

IIC2 (43″ +) Pale brown (10YR 6/3) to yellowish-brown (10YR 5/4) gravel and sand; strongly calcareous; single grained; loose.

Catlin Series (171)

The Catlin series consists of well- and moderately well-drained, dark-colored soils developed partly in loess more than 3 feet thick and partly in loam or silty clay loam glacial till. They have developed under grass vegetation on upland ridgetops and slopes ranging from 2 to 12 percent.

Catlin soils are deep and moderately permeable. They have very high available water capacity.

Areas of Catlin in the northwestern part of the county are developed primarily in loess over silty clay loam till and are associated with Tama (36) and Varna (223) soils. Areas of loess over loam till are of lesser extent; in such areas Catlin occurs with Tama (36) and Parr (221) soils, as in T26N, R8E (Silver Creek Township).

Four mapping units are shown on the soil map: 171B, 171C, 171C2, and 171D2. The eroded units have a portion of the B horizon mixed in the plow layers.

Catlin silt loam representative profile (171B)

A1 (0-9″) Black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; gradual, smooth boundary; pH 7.3.

A3 (9-15″) Dark brown (10YR 3/3) heavy silt loam; moderate, fine, granular, breaking to moderate, very fine, subangular blocky structure; friable; gradual, smooth boundary; pH 5.6.

B1t (15-23″) Brown (10YR 4/3) light silty clay loam; few very dark gray (10YR 3/1) wormcasts; moderate, very fine, subangular blocky structure; slightly firm; clear, smooth boundary; pH 5.1.

B21t (23-32″) Dark yellowish-brown (10YR 4/4) silty clay loam; thin, discontinuous dark yellowish-brown (10YR

3/4) clay coatings; moderate, fine, subangular blocky structure; slightly firm; clear, smooth boundary; pH 5.3.

B22t (32-40") Dark yellowish-brown (10YR 4/4) silty clay loam; thin, almost continuous dark yellowish-brown (10 YR 3/4) clay coatings; moderate, medium, subangular blocky structure; firm; gradual, smooth boundary; pH 5.3.

IIB3t (40-45") Dark yellowish-brown (10YR 4/4) heavy silty clay loam to silty clay; thin, discontinuous brown (10YR 4/3) clay coatings; moderate, coarse, angular blocky structure; firm; abrupt, smooth boundary; pH 6.0.

IIC (45" +) Brown (10YR 5/3) gritty silty clay loam with few, large, distinct yellowish-brown (10YR 5/6) mottles and streaks; few dark brown (10YR 4/3) clay coatings on vertical cleavage faces; weak, coarse, angular blocky structure; firm; strongly effervescent; glacial till.

Derinda Series (417)

The Derinda series is made up of light-colored, moderately well- and well-drained soils developed partly from loess (averaging about 1 to 2½ feet thick) and partly from shale bedrock. They occur on upland slopes ranging from 4 to 18 percent and have developed under mixed deciduous forest.

These soils have slow permeability and low to moderate available water capacity.

Derinda soils are mapped on portions of the ridge at Waddams Grove. They occur commonly in the shale uplands south of Eleroy and south and west of Pearl City. They are associated with the Eleroy (547) soils but have a thinner loess mantle. Derinda soils have lighter colored, thinner A horizons than Schapville (418) and Keltner (546) soils, which also occur in the same areas.

Four mapping units are shown on the soil map: 417C2, 417D2, 417D3, and 417E2. The severely eroded unit, 417D3, has a plow layer that is mostly B horizon.

Derinda silt loam representative profile (417C2)

Ap (0-7") Dark grayish-brown (10YR 4/2) silt loam; weak to moderate, medium, granular structure; friable; many roots; few light gray (10YR 7/1 and 7/2) silt coatings; very few, distinct black (10YR 2/1) iron-manganese concretions; pH 6.4; abrupt, smooth boundary.

B21t (7-12") Dark yellowish-brown (10YR 4/4) to yellowish-brown (10YR 5/4) light silty clay loam; moderate, fine and medium, subangular blocky structure; firm; plentiful roots; very dark grayish-brown (10YR 3/2) to dark grayish-brown (10YR 4/2) worm channel fillings; pH 6.2; clear, smooth boundary.

B22t (12-18") Dark brown to brown (10YR 4/3) heavy silty clay loam; few, fine, distinct yellowish-brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate to strong, very fine and fine, subangular blocky structure; firm; plentiful roots; discontinuous dark brown (10YR 4/3) clay films; few, fine, distinct black (10YR 2/1) iron-manganese concretions; few small chert fragments; pH 6.1; clear, smooth boundary.

IIB23t (18-23") Mixed grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/4) silty clay with common, fine, distinct yellowish-brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate, fine and medium, prismatic, breaking to strong, fine and medium, angular blocky structure; firm; plentiful roots; continuous dark gray (10YR 4/1) clay films;

The cultivated sloping land is mostly Derinda soils derived from shale bedrock. The oak trees are on areas shallow to dolomite bedrock. In the foreground are level alluvial soils along the East Plum River. (Fig. 15)

many, fine, distinct black (10YR 2/1) iron-manganese concretions; few small chert fragments; pH 6.5; clear, smooth boundary.

IIB3 (23-25") Mixed brownish-yellow (10YR 6/6) to yellow (10YR 7/8) and strong brown (7.5YR 5/6 and 5/8) loam appearing to be mainly disintegrated soft limestone; weak, medium, angular blocky structure; very friable; few roots; numerous dark grayish-brown (10YR 4/2) coatings in root channels; many, fine, distinct black (10YR 2/1) iron-manganese specks; calcareous; clear, smooth boundary.

IIC (25-60") Greenish-gray (5GY 6/1), pale olive (5Y 6/3), dark reddish-gray (10R 4/1), reddish-gray (10R 5/1), and weak red (10R 5/2) clay shale with spots of white (10YR 8/1) concentrated lime in the pale olive zones; a few brownish-yellow to yellow (10YR 6/6 to 7/8) limestone slabs, 2 to 3 inches thick, occur just below the IIB3 horizon in a discontinuous pattern; weak, coarse, angular blocky structure to massive; extremely firm; few roots in upper part; calcareous. Within the shale, limestone chunks 1 to 3 inches in diameter occur, occupying about 5 percent of the soil solum.

Dickinson Series (87)

The Dickinson series is composed of dark-colored, well-drained and somewhat excessively drained soils developed in water-deposited, sandy sediments, which in some places have been reworked by wind. These soils developed under grass vegetation on slopes ranging from about 2 to 7 percent.

These soils have moderately rapid to rapid permeability and low available water capacity.

The Dickinson soils, which are not extensive, are found mainly along the Pecatonica River, especially south of the river and east of Ridott. They are associated with Proctor soils (148), which are derived from less sandy sediments, and with Hitt soils (506), which have dolomite bedrock at less than 5 feet. It is the only series mapped in the county that has a sandy surface horizon.

Included with Dickinson on the soil map are some areas that have light-colored surface horizons and a few areas that have more clay in the B horizons than described in the representative profile. Two mapping units are shown on the soil map: 87B and 87C2. About one-half of the original A horizon has been lost on the eroded unit.

Dickinson sandy loam representative profile (87B)

A1 (0-8″) Very dark brown (10YR 2/2) sandy loam; compound weak, fine and medium, subangular blocky and very fine and fine, granular structure; very friable; clear, smooth boundary, pH 6.3.

A3 (8-13″) Very dark grayish-brown (10YR 3/2) sandy loam with occasional spots of very dark brown (10YR 2/2); compound weak, medium and coarse, subangular blocky and very fine, fine, and medium, granular structure; very friable; clear, smooth boundary; pH 6.3.

B2 (13-19″) Dark brown (7.5YR 3/2 and 3/3) sandy loam; compound weak, medium and coarse, subangular blocky and fine, granular structure; very friable; clear, smooth boundary; pH 6.0.

B3 (19-24″) Dark brown to brown (7.5YR 4/4) sandy loam to loamy fine sand; weak, coarse, subangular blocky structure; very friable; clear, smooth boundary; pH 5.8.

C1 (24-30″) Strong brown (7.5YR 5/6 and 4/6) loamy fine sand; weak, coarse, subangular blocky structure; loose; gradual, smooth boundary; pH 5.8.

C2 (30-60″) Dark brown to brown (7.5YR 4/4) and brown (7.5YR 5/4) fine sand; structureless; single grained; pH 6.0.

Dodgeville Series (40)

The Dodgeville series consists of dark-colored, well-drained soils developed under grass vegetation partly from loess 18 to 36 inches thick and partly in limestone residuum of variable thickness. Limestone usually occurs at depths of between 20 to 40 inches. These soils occur on upland slopes ranging from about 4 to 18 percent.

Dodgeville soils have moderate to moderately slow permeability and moderate available water capacity.

Associated soils include Tama (36), formed entirely in loess; Ashdale (411), developed in 3 to 5 feet of loess on limestone bedrock; Hitt (506), developed in loess and glacial drift on limestone bedrock; and Sogn (504), which has limestone bedrock at less than 15 inches and lacks a B horizon. Included with Dodgeville soils are some areas where both loess and glacial drift make up the mantle over the limestone bedrock. Some areas also have residuum or weathered limestone layers less than 6 inches thick.

Dodgeville soils occur in a scattered pattern in the county where limestone bedrock is near the land surface. The largest areas are in the vicinity of Orangeville and Oneco in the north-central part of the county.

The four mapping units shown on the soil map are 40C, 40C2, 40D2, and 40E2. The eroded units have some mixing of B horizon in the plow layers; in a few areas the clayey residuum is directly below the plow layer.

Dodgeville silt loam representative profile (40C)

Ap (0-7″) Very dark brown (10YR 2/2) silt loam; cloddy, breaking to moderate, medium and coarse, granular structure; friable; abrupt, smooth boundary; pH 7.0.

B1 (7-11″) Very dark grayish-brown and dark brown (10YR 3/2 and 3/3) light silty clay loam; moderate, medium, granular structure; friable; clear, smooth boundary; pH 7.0.

B21t (11-17″) Brown (10YR 4/3) silty clay loam; moderate, medium and fine, subangular blocky structure with nearly continuous dark brown (10YR 3/3) clay coatings; firm; clear, smooth boundary; an occasional chert pebble; pH 6.3.

B22t (17-24″) Brown and dark yellowish-brown (10YR 4/3 and 4/4) heavy silty clay loam; moderate, medium and fine, subangular blocky structure with patchy dark brown (10 YR 3/3) clay coatings; firm; an occasional chert pebble and possibly slight till influence; clear, smooth boundary; pH 5.7.

IIB23t (24-33″) Reddish-brown and yellowish-red (5 YR 4/4 and 4/6) silty clay to clay with some dark reddish-brown (5YR 3/3 and 3/2) in lower inch; weak to moderate, medium and coarse, angular blocky structure with patchy dark reddish-brown (5YR 3/4) clay coatings; extremely firm; much chert; abrupt, smooth boundary; pH 6.0.

R (33″ +) Yellow (10YR 7/6 and 2.5Y 7/6) and pale yellow (2.5Y 7/4) dolomitic limestone; broken and sandy in upper few inches; calcareous.

Dorchester Series (239)

The Dorchester series is made up of dark- and moderately dark-colored, somewhat poorly and moderately well-drained soils occurring on flood plains of streams in areas where there is much outcropping dolomitic limestone in the bordering uplands. These soils are weakly calcareous with fine grains of dolomite disseminated throughout the washed-in, silty sediments.

Dorchester soils are deep; they have moderate permeability and very high available water capacity.

These are the major soils in the flood plain of the East Plum River, and they occur along Waddams Creek and elsewhere in association with Dorchester silt loam, rocky substratum phase (578) and other bottomland soils. A buried soil often occurs below 40 inches.

The only mapping unit shown on the soil map is 239.

Foreground: **Calcareous Dorchester silt loam in the level flood plain of the East Plum River near the southwest corner of the county.** ***Background:*** **Dolomite and shale bedrock at shallow depths in the sloping upland. (Fig. 16)**

Dorchester silt loam representative profile (239)

A11 (0-11″) Mixed very dark gray (10YR 3/1), very dark brown (10YR 2/2), and dark gray (10YR 4/1) silt loam; strong, fine and medium, crumb structure; very friable; clear, smooth boundary; calcareous; slightly effervescent.

A12 (11-52″) Very dark gray (10YR 3/1) silt loam, grading to nearly black (10YR 2/1) in lower part of horizon; common, fine, prominent dark reddish-brown (5YR 3/4) mottles; many bands of grayish brown (10YR 5/2) 1 to 2 inches thick; strong, thin and medium, platy structure; very friable; clear, smooth boundary; calcareous; slightly effervescent.

A1b (52-80″) Black (10YR 2/1) heavy silt loam; many, fine and medium, prominent dark reddish-brown (5YR 3/4) mottles; massive; weakly calcareous; limestone rubble at 80 inches.

Dorchester, Cobbly Subsoil Variant (578)

This soil variant is similar to the Dorchester soils (239) just described. The variant differs in having cobbly dolomite and chert or occasionally solid bedrock at depths of usually less than 40 inches. These soils are dark and moderately dark; they are mostly moderately well drained but occasionally are somewhat poorly drained. They occur on stream flood plains.

These soils have moderate permeability in the upper part and rapid permeability in the cobbly material. They have moderate to high available water capacity, depending on the depth to the underlying cobbly material.

This variant is minor in occurrence, but it may be found in some tributary branches of the East Plum River, along Crane Creek in Silver Creek Township, along portions of Waddams Creek, and elsewhere. It is found mainly with Dorchester silt loam (239).

The only mapping unit shown on the soil map is 578.

Dorchester silt loam, cobbly subsoil variant representative profile (578)

A11 (0-5″) Very dark grayish-brown (10YR 3/2) silt loam; strong, fine and medium, crumb structure; very friable; clear, smooth boundary; calcareous; slightly effervescent.

A12 (5-24″) Very dark grayish-brown (10YR 3/2) with thin bands of grayish-brown (10YR 5/2) silt loam; a band of sandy loam at 14- to 15-inch depth; strong, thin and medium, platy structure; very friable; abrupt, smooth boundary; calcareous; slightly effervescent.

IIA13 (24-34″) Very dark gray (10YR 3/1) heavy gravelly loam; main color (10YR 3/1) grades to nearly black (10YR 2/1) in lower part of horizon and is mixed with grayish brown (10YR 5/2), dark grayish brown (10YR 4/2), and very dark grayish brown (10YR 3/2); few, fine, prominent dark reddish-brown (5YR 3/4) iron stains; massive; abrupt, smooth boundary; calcareous; slightly effervescent.

IIC (34-60″ +) Mixed chert, limestone cobbles, and igneous rocks with enough fines to be loamy gravel; structureless; the uppermost 2 inches of this layer is black (10YR 2/1) gravelly loam; calcareous; slightly effervescent.

Downs Series (386)

The Downs series consists of moderately dark-colored, moderately well- and well-drained soils developed in thick loess in transitional prairie-forest areas. They occur on nearly level to strongly sloping (1- to 12-percent) areas in the upland and occasionally on loess-covered terrace or bench positions. These are extensive soils and occupy more than 26,000 acres in the county.

Downs soils are similar to, but have better natural drainage than, the somewhat poorly drained Atterberry (61) soils and have thinner and lighter colored surface horizons than Tama (36) and Muscatine (41) but are darker colored than Fayette (280) and Rozetta (279) soils. They occur commonly between the Tama soils and the Fayette and Rozetta soils and in forested areas where hard maple has been the dominating species.

Downs soils are deep; they have moderate permeability and very high available water capacity.

Five mapping units are shown on the soil map: 386A, 386B, 386C, 386C2, and 386D2. The last two are moderately eroded units that have lost about one-half of the A horizon, and the A1, A2, and upper B horizons are incorporated into the plow layer.

Downs silt loam representative profile (386A)

A1 (0-7″) Black (10YR 2/1) silt loam, very dark gray (10YR 3/1) when crushed; moderate, medium and coarse, crumb structure; very friable; abrupt, smooth boundary; pH 6.7.

A21 (7-10″) Very dark grayish-brown to dark grayish-brown (10YR 3/2 to 4/2) silt loam with few very dark gray (10YR 3/1) organic coats on some peds; compound weak, thin, platy structure and moderate, fine, subangular blocky structure; very friable; clear, smooth boundary; pH 6.0.

A22 (10-14″) Dark grayish-brown (10YR 4/2) silt loam with few very dark gray (10YR 3/1) organic coats on some peds; moderate, medium, subangular blocky structure; very friable; clear, smooth boundary; pH 6.0.

B1t (14-18″) Dark brown (10YR 4/3) light silty clay loam with moderate, fine and medium, subangular blocky structure; friable; clear, smooth boundary; pH 6.3.

B21t (18-25″) Dark brown (10YR 4/3) silty clay loam with thin, discontinuous clay coatings of dark grayish brown to dark brown (10YR 4/2 to 4/3); moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

B22t (25-33″) Dark yellowish-brown (10YR 4/4) silty clay loam with thin, discontinuous dark brown (7.5YR 3/2) clay-organic coats; few, fine, faint yellowish-brown (10YR 5/6) mottles; compound weak, coarse, subangular blocky and moderate, medium and fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

B23t (33-43″) Dark yellowish-brown (10YR 4/4) silty clay loam with thin, continuous clay coatings and moderately thick, discontinuous dark brown (7.5YR 3/2) and very dark gray (7.5YR 3/1) organic coatings on peds and in root channels; common, fine, distinct yellowish-brown (10YR 5/6) and common, medium, distinct very pale brown (10YR 7/3) mottles; moderate, coarse, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

B3t (43-54″) Dark yellowish-brown (10YR 4/4) light silty clay loam with thin, discontinuous clay coatings and thin, discontinuous dark brown (7.5YR 3/2) organic coatings on peds and in root channels; organic coatings less abundant than in B23t horizon; common, fine, distinct yellowish-brown (10 YR 5/6) and common, medium, distinct very pale brown (10YR 7/3) mottles; compound weak, coarse, prismatic and moderate, coarse, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

C (54″+) Dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4) silt loam with common, medium, distinct very pale brown (10YR 7/3) mottles; massive structure; friable; pH 6.3.

Drummer Series (152)

The Drummer series is made up of very dark-colored, poorly drained soils developed under wet prairie or marsh grass vegetation from loess or silty material 3 to 5 feet thick and medium-textured outwash.

Drummer soils are deep; they have moderate permeability and very high available water capacity.

These soils occur in nearly level areas on terraces or outwash plains in association with Elburn (198) and Plano (199) soils. These soils are limited for some uses because of a seasonally high water table.

Only one mapping unit is shown on the soil map: 152.

Drummer silty clay loam representative profile (152)

Ap (0-6″) Black (10YR 2/1) light silty clay loam; moderate, very fine and fine, granular structure; firm; abrupt, smooth boundary; pH 7.5; high organic matter content.

A12 (6-15″) Black (10YR 2/1) silty clay loam; moderate to strong, fine and medium, granular structure; firm; clear, smooth boundary; pH 7.0.

B1g (15-20″) Dark gray and gray (10YR 4/1 and 5/1) silty clay loam with few, fine, distinct dark yellowish-brown (10YR 3/4 and 4/4) mottles; moderate, very fine, subangular blocky structure; firm; clear, smooth boundary; pH 7.0.

B21g (20-27″) Gray (10YR 5/1) silty clay loam with many, medium, prominent dark brown and strong brown (7.5 YR 4/4 and 5/6) mottles and few black (10YR 2/1) channel fillings; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

B22g (27-37″) Gray and olive-gray (5Y 6/1 and 5/2) silty clay loam with many, medium, prominent dark brown and strong brown (7.5YR 4/4 and 5/6) mottles and few, medium, prominent dark reddish-brown (5YR 3/4) mottles; few very dark gray (10YR 3/1) channel fillings; moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

B31g (37-43″) Gray and olive-gray (5Y 5/1 and 5/2) light silty clay loam with few, medium, distinct dark brown and brown (7.5YR 4/4 and 5/4) mottles and few dark gray (10YR 4/1) channel fillings; weak, medium, angular blocky structure; firm; clear, smooth boundary; pH 7.5.

IIB32g (43-51″) Grayish-brown (2.5Y 5/2), gray (5Y 5/1), and olive-gray (5Y 5/2) heavy silt loam with some fine sand; few, medium, distinct yellowish-brown (10YR 5/4 and 5/6) mottles; few channel fillings of very dark grayish brown (10YR 3/2); weak, coarse, angular blocky structure; friable; clear, smooth boundary; pH 7.5.

IIC1g (51-73″) Olive-gray (5Y 5/2) loam and silt loam with thin, sandy loam bands; few, fine, distinct yellowish-brown (10YR 5/4) mottles; root channel fillings of very dark grayish brown (10YR 3/2); massive; friable; gradual, smooth boundary; calcareous, with moderate effervescence.

IIC2g (73-77″+) Dark greenish-gray and greenish-gray (5GY 4/1 and 5/1) stratified loam, silt loam, and fine sandy loam with few very dark grayish-brown and dark brown (10YR 3/2 and 4/3) root channel fillings; massive; friable; calcareous, with strong effervescence.

Dubuque Series (29)

The Dubuque series is composed of light-colored, well-drained soils occurring in upland areas where dolomitic limestone is found at depths of 20 to 40 inches. They have developed under forest vegetation in about 18 to 36 inches of loess and limestone residuum of variable thickness (usually less than 6 inches).

Dubuque soils have moderate to moderately slow permeability and moderate available water capacity.

Associated soils include Fayette (280), which has developed entirely in loess; Palsgrove (429), which has developed in from 36 to 50 inches of loess and residuum; and Sogn (504), which has a thin loess cover (less than 15 inches) directly on limestone with no residuum or B horizon in loess present. Included with the Dubuque soils are some areas where small amounts of glacial drift are present along with loess above the bedrock.

Dubuque soils occur on ridgetops in areas of thin loess and on side slopes in areas of thicker loess. They occur extensively north and east of Lena and south of Winslow along the Pecatonica River and its tributaries. Dubuque soils also occur extensively in Jefferson Township in the southwestern corner of the county and in a scattered pattern in the eastern part of the county. In the more sloping areas, Dubuque soils are included with Dunbarton soils (which developed in thin loess and residuum with limestone occurring at a depth of 20 inches or less) on the soil map as an undifferentiated unit (973).

The four mapping units shown on the map are 29C, 29C2, 29D, and 29D2. The moderately eroded units have lost about one-half of their A horizons.

Dubuque silt loam representative profile (29C)

A1 (0-4″) Dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; abrupt, smooth boundary; pH 6.5.

A2 (4-8″) Brown (10YR 4/3) silt loam; wormcasts of dark grayish brown (10YR 4/2); weak, medium, platy to moderate, medium, granular structure; friable; clear, smooth boundary; pH 6.2.

B1 (8-12″) Dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, fine, subangular blocky structure; friable; clear, smooth boundary; pH 6.0.

B21t (12-19″) Yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, subangular blocky structure; firm; discontinuous dark yellowish-brown (10YR 4/4) clay coatings; clear, smooth boundary; pH 6.0.

B22t (19-26″) Dark yellowish-brown (10YR 4/4) silty clay loam; moderate to strong, medium, subangular blocky structure; firm; discontinuous dark brown (7.5YR 4/4) clay coatings; a few very dark brown (10YR 2/2) iron-manganese stains; clear, smooth boundary; pH 6.0.

IIB23t (26-31″) Dark brown (7.5YR 4/4) silty clay to clay; moderate, medium, subangular and angular blocky structure; very firm; discontinuous reddish-brown (5YR 4/4) clay coatings; a few very dark brown (10YR 2/2) iron-manganese stains; abrupt, wavy boundary; pH 6.7.

R (31″ +) Yellowish-brown and brownish-yellow (10 YR 5/6 and 6/6) dolomitic limestone partially disintegrated in upper few inches.

Dubuque and Dunbarton, Undifferentiated (973)

The Dubuque and Dunbarton undifferentiated unit occurs on strongly sloping to steep topography in several areas in Stephenson County but most extensively north and east of Lena and in the southwestern corner of the county.

These are light-colored, well-drained soils developed under forest vegetation on slopes ranging from 7 to about 30 percent where limestone occurs at less than 40 inches. Dubuque soils (29) are developed from loess and residuum in areas where limestone occurs between 20 and 40 inches. Dunbarton soils developed in very thin loess and in residuum in areas where limestone bedrock occurs at less than 20 inches. Most of the B horizon is formed in the fine-textured residuum. Dunbarton soils have moderate to slow permeability and low available water capacity. On the steeper slopes the loess thickness and depth to bedrock is so variable that these soils cannot be accurately separated on the soil map and are shown as an undifferentiated unit.

Associated soils include Palsgrove (429), which is developed in 36 to 50 inches of loess over residuum and limestone and occurs on the broader ridgetops, and Sogn (504), which has a thin loess cover (less than 15 inches) over limestone, lacks a B horizon, and occurs on very steep slopes with occasional to frequent rock outcrops.

The four mapping units shown on the soil map are 973D3, 973E2, 973E3, and 973F2. Some B horizon is normally mixed with the plow layer in all cultivated areas, and in the severely eroded units the plow layer consists primarily of B horizon that in many places is developed in the fine-textured limestone residuum.

Dunbarton silt loam representative profile (part of 973E2)

Ap (0-6″) Dark grayish-brown (10YR 4/2) heavy silt loam; weak, coarse, granular structure; friable; abrupt, smooth boundary; pH 7.0.

B21t (6-10″) Brown (7.5YR 5/4) heavy silty clay loam; moderate, fine, subangular blocky structure; firm; continuous dark brown (7.5YR 4/4) clay coatings; clear, smooth boundary; pH 7.2.

IIB22t (10-17″) Brown and dark brown (7.5YR 5/4 and 4/4) clay; moderate to strong, medium, angular and subangular blocky structure; very firm; discontinuous reddish-brown (5YR 4/4) clay coatings; abrupt, wavy boundary; pH 7.2.

R (17″ +) Yellow, light yellowish-brown, and brownish-yellow (10YR 7/6, 6/4, and 6/6) with some coatings of yellowish-brown (10YR 5/4) dolomitic limestone, which is disintegrated in a few places in the upper portion.

Dubuque and Dunbarton are the dominant soils on the valley side slopes in this landscape; both are shallow to limestone bedrock. The light area in the center background is a quarry in the dolomitic limestone. (Fig. 17)

Durand Series (416)

The Durand series consists of dark-colored, well- and moderately well-drained soils developed under grass vegetation in the upland. These soils have developed in 15 to 30 inches of loess and in glacial drift of sandy loam or loam texture underlying the loess. Weathering and soil development proceeded in the till or drift prior to loess deposition. Sola are normally thicker than 4 feet and may be as thick as 6 or 7 feet. The solum may rest directly on limestone bedrock or may be underlain by calcareous drift.

Durand soils are deep; they have moderate permeability and high available water capacity.

These soils occupy ridgetops and side slopes ranging from 2 to 12 percent and occur with Tama (36), Ogle (412), and Griswold (363) soils. They occur mainly in the eastern one-half of the county.

The four mapping units shown on the soil map are 416B, 416C, 416C2, and 416D2. The moderately eroded units have lost about one-half of the A horizons. Included with Durand are a few areas that have less than 15 inches of loess.

Durand silt loam representative profile (416C)

Ap (0-7″) Very dark grayish-brown (10YR 3/2) silt loam; nearly massive, breaking to moderate, fine, crumb structure; friable; clear, smooth boundary; pH 7.5.

A3 (7-10″) Dark brown (10YR 3/3) heavy silt loam; compound moderate, coarse, subangular blocky and moderate, fine and medium, crumb structure; friable; clear, smooth boundary; pH 7.5.

B21t (10-14″) Dark yellowish-brown (10YR 4/4) silty clay loam; continuous dark brown (10YR 3/3) organic coatings over all ped surfaces; moderate, coarse, subangular blocky structure; friable; clear, smooth boundary; pH 7.3.

B22t (14-24″) Dark yellowish-brown (10YR 4/4) silty clay loam; discontinuous dark brown (10YR 3/3) clay coatings over all ped surfaces; moderate, medium and coarse, prismatic structure; friable; gradual, smooth boundary; pH 6.5.

IIB23t (24-65") Dark brown and brown (7.5YR 4/4) clay loam; thin, patchy dark reddish-brown (5YR 3/4) clay coatings over all ped surfaces; common, fine, black (N 2/0) iron and manganese stains and root channels; strong, coarse, subangular blocky structure; firm; few chert fragments and igneous pebbles present; pH 6.1.

IIIB3 (65-70") Dark reddish-brown (5YR 3/4) silty clay to clay residuum; weak, coarse, subangular blocky structure; very firm; abrupt, wavy boundary; pH 7.0.

R (70" +) Yellow and yellowish-brown (10YR 7/6 and 5/8) dolomitic limestone.

Edgington Series (272)

The Edgington series is composed of dark-colored, poorly drained soils developed in loess under grass vegetation. These soils occur as small delineations in level areas or depressions, often near the head of a drainageway in the loess-covered upland. They have light-colored A2 horizons below dark-colored A1 horizons.

These soils have moderately slow to slow permeability and high available water capacity.

Edgington soils are not extensive in the county. They occur primarily with Muscatine (41) and occasionally with Sable (68) and Tama (36) soils, which are all dark colored and derived from loess.

Only one mapping unit, 272, is shown on the soil map. A few areas were included that have thinner total A horizons than described in the representative profile.

Edgington silt loam representative profile (272)

Ap (0-7") Black (10YR 2/1) silt loam; moderate, fine and medium, subangular blocky structure; friable; abrupt, smooth boundary; pH 7.0.

A12 (7-13") Black (10YR 2/1) to very dark gray (10 YR 3/1) silt loam; upper part is moderate, fine and medium, subangular blocky structure and lower part is moderate, thin, platy structure; friable; clear, smooth boundary; pH 6.8.

A21 (13-19") Gray (10YR 5/1) silt loam; few dark gray (10YR 4/1) spots; strong, thin, platy structure; friable; clear, smooth boundary; pH 5.8.

A22 (19-25") Light gray (10YR 6/1) silt loam; nearly continuous light gray (10YR 7/1) silt coats, not evident when moist, over all ped surfaces; strong, medium, platy structure; friable; clear, smooth boundary; pH 5.5.

B21tg (25-29") Mixed gray (10YR 5/1) and dark gray (10YR 4/1) silty clay loam; few, fine, prominent yellowish-red (5YR 4/8) mottles; discontinuous silt coats over all ped surfaces, light gray (10YR 7/1) when dry; very dark gray (10YR 3/1) and dark gray (10YR 4/1) thin clay or organic coats; compound strong, medium, prismatic and fine and medium, subangular and angular blocky structure; very firm; abrupt, smooth boundary; pH 6.0.

B22tg (29-34") Grayish-brown (2.5Y 5/2) light silty clay; few, fine, prominent yellowish-red (5YR 5/6 and 5/8) mottles; discontinuous very dark gray (10YR 3/1) and dark gray (10YR 4/1) clay or organic coats over all ped surfaces; few, fine, black (N 2/0) iron-manganese stains; compound strong, coarse, prismatic and medium and coarse, angular blocky and subangular blocky structure; extremely firm; clear, smooth boundary; pH 6.2.

B23tg (34-44") Olive-gray (5Y 5/2) and light olive-gray (5Y 6/2) silty clay loam; few, fine, prominent yellowish-red (5YR 4/6 and 4/8) mottles; moderately thick, discontinuous dark gray (10YR 4/1) clay coats over all ped surfaces; few, fine, black (N 2/0) iron-manganese stains; compound moderate, coarse, prismatic and medium and coarse, angular blocky and subangular blocky structure; very firm; clear, smooth boundary; pH 6.5.

B3tg (44-54") Olive-gray (5Y 5/2) to light olive-gray (5Y 6/2) silty clay loam; mottles same as in B23tg; black (10 YR 2/1) root channel fillings; few, fine, black (N 2/0) iron-manganese stains; weak, coarse, angular blocky structure; firm; gradual, smooth boundary; pH 6.7.

Cg (54-60" +) Massive silt loam with few, fine, black (N 2/0) iron-manganese concretions; pH 7.0, becoming calcareous at 6 feet.

Elburn Series (198)

The Elburn series consists of dark-colored, somewhat poorly drained soils developed partly in loess or silty material 3 to 5 feet thick and partly in medium-textured outwash. They have developed under grass vegetation on nearly level to gently sloping topography (0- to 4-percent slopes) on loess-covered benches or stream terraces or upland outwash areas.

Elburn soils are deep and moderately permeable. They have high to very high available water capacity.

Associated soils are primarily Plano (199), Drummer (152), and Virgil (104) soils. Elburn soils are intermediate in drainage between Plano and Drummer and lack the A2 horizon of Virgil soils. Some areas included in bench or terrace positions have more than 5 feet of loess and resemble Muscatine (41) soils.

The two mapping units shown on the soil map are 198A and 198B.

Elburn silt loam representative profile (198A)

Ap (0-7") Black (10YR 2/1) silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 7.0.

A12 (7-13") Black (10YR 2/1) heavy silt loam; moderate, fine to coarse, crumb structure; friable; clear, smooth boundary; pH 6.3.

AB (13-18") Very dark grayish-brown (10YR 3/2) silty clay loam; strong, medium and coarse, crumb structure; friable; clear, smooth boundary; pH 6.5.

B21t (18-27") Dark grayish-brown to olive-brown (2.5 Y 4/2 to 4/4) silty clay loam with few, fine, distinct yellowish-brown (10YR 5/6) mottles; few, fine, black (N 2/0) iron-manganese concretions; nearly continuous very dark gray (10 YR 3/1) clay coatings; moderate, medium, subangular and angular blocky structure; firm; clear, smooth boundary; pH 6.7.

B22t (27-36") Grayish-brown and light brownish-gray (2.5Y 5/2 and 6/2) silty clay loam with common, fine and medium, distinct yellowish-brown (10YR 5/6 and 5/8) mottles; few, fine, black (N 2/0) iron-manganese stains; discontinuous very dark gray and dark gray (10YR 3/1 and 4/1) clay coatings; compound moderate, medium, prismatic and medium, subangular and angular blocky structure; firm; clear, smooth boundary; pH 7.0.

B23t (36-44″) Olive-gray (5Y 5/2) silty clay loam with common, fine and medium, distinct yellowish-brown (10YR 5/6 and 5/8) mottles; very few, fine, black (N 2/0) iron-manganese stains; discontinuous very dark gray and dark gray (10 YR 3/1 and 4/1) clay coatings and channel fillings; weak, coarse, angular and subangular blocky structure; firm; abrupt, smooth boundary; pH 7.0.

IIB3t (44-49″) 50-percent olive-gray (5Y 5/2) and 50-percent yellowish-brown (10YR 5/4 and 5/6) silt loam and loam with common, fine, prominent strong brown (7.5YR 5/6 and 5/8) mottles and dark gray (10YR 4/1) channel fillings; weak, coarse, angular and subangular blocky structure; friable to firm; clear, smooth boundary; pH 7.5.

IIC1 (49-60″) 80-percent yellowish-brown (10YR 5/4 and 5/6) and 20-percent grayish-brown (2.5Y 5/2) loam and sandy loam with few, medium, distinct strong brown (7.5YR 5/6 and 5/8) mottles; massive; clear, smooth boundary; calcareous, with moderate effervescence.

IIC2 (60-74″ +) Yellowish-brown, light yellowish-brown, and brownish-yellow (10YR 5/6, 6/4, and 6/6) loamy sand and sand with a few inches of loamy gravel in the upper part; single-grained; calcareous, with moderate effervescence.

Eleroy Series (547)

The Eleroy series is made up of light-colored, well- and moderately well-drained soils occurring on shale uplands and developed partly in loess 30 to 50 inches thick and partly in fine-textured shale. These soils have developed under forest vegetation on slopes ranging from 2 to 12 percent.

Eleroy soils have moderate permeability in the upper solum and slow permeability in the shale. They have moderate to high available water capacity.

These soils are restricted to the shale bedrock areas mainly south of Eleroy and south and west of Pearl City. Some areas occur on the ridge at Waddams Grove. Associated soils are Derinda (417), developed in thinner loess, and Massbach (753) and Keltner (546), which have similar parent materials but darker Ap or thicker A1 horizons.

Four mapping units are shown on the soil map: 547B, 547C, 547C2, and 547D2. The eroded mapping units have lost about one-half of their surface horizons.

Eleroy silt loam representative profile (547C)

Ap (0-8″) Dark gray (10YR 4/1) to dark grayish-brown (10YR 4/2) with about 10-percent brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; abrupt, wavy boundary; pH 6.8; numerous fine pores in peds.

B21t (8-17″) Yellowish-brown (10YR 5/4) silty clay loam with discontinuous brown (10YR 5/3) clay coatings and some silt coatings of light gray (10YR 7/2) when dry; moderate, medium to fine, subangular blocky, breaking to moderate to strong, medium, granular structure; firm to friable; clear, smooth boundary; pH 5.8; numerous fine pores in peds.

B22t (17-21″) Yellowish-brown (10YR 5/4) medium to heavy silty clay loam with moderately thick, continuous brown (10YR 5/3) clay coatings and numerous light gray (10YR 7/2) silt coatings when dry; few, fine, faint yellowish-brown (10YR 5/8) mottles; strong, medium to fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.5; numerous fine pores in peds.

B23t (21-29″) Brown (10YR 5/3) heavy silty clay loam with thick gray (10YR 5/1) clay coatings and numerous light gray (10YR 7/2) silt coatings when dry; many, medium, distinct yellowish-brown (10YR 5/8) and light brownish-gray (2.5Y 6/2) mottles; weak, medium to fine, prismatic, breaking to moderate to strong, medium, angular to subangular blocky structure; firm; clear, smooth boundary; pH 5.5; common fine pores in peds; many black (10YR 2/1) and very dark grayish-brown (10YR 3/2) iron-manganese concretions.

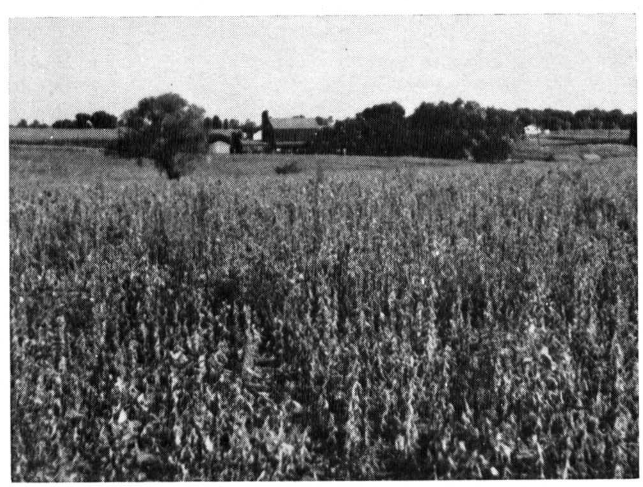
B31t (29-38″) Grayish-brown (10YR 5/2) silty clay loam with moderately thick gray (10YR 5/1) clay coatings and some light gray (10YR 7/2) silt coatings when dry; many, medium, distinct light olive-brown (2.5Y 5/4) and common, medium, distinct yellowish-brown (10YR 5/8) mottles; many black (10YR 2/1) and very dark grayish-brown (10YR 3/2) iron-manganese concretions; moderate, medium to coarse, angular blocky structure; firm; clear, smooth boundary; pH 6.3; common fine pores in peds; a few chert pebbles.

IIB32t (38-42″) Light olive-brown (2.5Y 5/4) heavy silty clay loam to silty clay with moderately thick gray (10YR 5/1), grayish-brown (10YR 5/2), and brown (10YR 5/3) clay coatings; common, medium, distinct yellowish-brown (10YR 5/8) mottles; many black (10YR 2/1) and very dark grayish-brown (10YR 3/2) iron-manganese concretions; moderate, coarse to medium, angular blocky structure; firm; abrupt, smooth boundary; pH 7.0; common fine pores in peds; few chert pebbles; horizon thought to be developed in mixed loess and shale.

IIC (42-60″ +) Light olive-brown (2.5Y 5/4) clay shale with some grayish brown (2.5Y 5/2); greenish-gray (5 GY 6/1) coatings on cleavage faces; common, coarse, prominent pieces of yellow (10YR 7/8) limestone; massive, with some cleavage planes evident; very firm; calcareous.

Fayette Series (280)

The Fayette series consists of light-colored, well-drained soils developed on thick loess-covered uplands under mixed deciduous forest vegetation. They occur on ridgetops and slopes ranging from 2 to 30 percent in a scattered pattern throughout the county. The E slope designation for the 280E2 mapping unit



Fayette soils dominate both the ridgetops and side slopes in this area (west of Freeport), which is loess covered and originally supported oak and hickory forest. (Fig. 18)

indicates a slope range of 12 to 30 percent, a departure from the normal range used in this report (12 to 18 percent). The largest areas occur west of Freeport, extending to the west county line. Occupying nearly 28,000 acres, Fayette is the second most extensive series in the county.

Fayette soils are deep; they have moderate permeability and high to very high available water capacity.

Associated soils are Rozetta (279), moderately well-drained, and Stronghurst (278), somewhat poorly drained. Fayette soils are also associated with Downs (386) and Atterberry (61), which have thicker and darker A1 horizons. All these soils occur in areas where loess thickness generally exceeds 5 feet.

Seven mapping units are shown on the soil map.

Fayette silt loam representative profile (280B)

A1 (0-4″) Very dark grayish-brown (10YR 3/2) to very dark gray (10YR 3/1) silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 7.5.

A2 (4-10″) Brown (10YR 5/3) to dark brown (10YR 4/3) silt loam with some mixing of very dark grayish brown (10YR 3/2) in upper 2 inches of horizon; moderate, thin and medium, platy structure in upper 2 inches of horizon and moderate, fine and medium, subangular blocky structure in the lower part; friable; clear, smooth boundary; pH 6.0.

B1 (10-15″) Dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.5.

B21t (15-22″) Dark yellowish-brown (10YR 4/4) silty clay loam; moderately thick, continuous brown to dark brown (7.5YR 4/4) clay coats and thin, patchy brown (10YR 5/3) silt coats on all ped surfaces; strong, medium and coarse, subangular blocky structure; firm; clear, smooth boundary; pH 5.0.

B22t (22-32″) Dark yellowish-brown (10YR 4/4) silty clay loam; moderately thick, continuous brown to dark brown (7.5YR 4/4) clay coats and thin, discontinuous brown (10YR 5/3) silt coats on all ped surfaces; strong, medium, subangular blocky structure; firm; clear, smooth boundary; pH 5.0.

B23t (32-45″) Yellowish-brown (10YR 5/4) silty clay loam; moderately thick, continuous brown to dark brown (7.5 YR 4/4) clay coats and thin, discontinuous brown (10YR 5/3) silt coats on all ped surfaces; moderate, medium, subangular blocky and angular blocky structure; firm; gradual, smooth boundary; pH 5.5.

B3t (45-65″) Yellowish-brown (10YR 5/4) light silty clay loam; continuous dark brown (10YR 4/3) and dark yellowish-brown (10YR 3/4) clay coats on major ped surfaces; weak, coarse, angular blocky structure; firm; gradual, smooth boundary; pH 6.0.

C1 (65-70″) Brown (10YR 5/3) silt loam; few, fine, faint yellowish-brown (10YR 5/6) mottles; structureless; massive; gradual, smooth boundary; pH 7.0.

C2 (70-76″ +) Brown (10YR 5/3) silt; few, fine, faint yellowish-brown (10YR 5/6) mottles; structureless; massive; calcareous; strongly effervescent.

Other mapping units are:

280C

280C2 Some B horizon is mixed with plow layer.

280D

280D2 Some B horizon is mixed with plow layer.

280D3 Plow layer is primarily B horizon.

280E2 Some B horizon is mixed with plow layer. Slopes range from 12 to 30 percent.

Fishhook-Atlas Complex (971)

Fishhook-Atlas complex occurs in small delineations in a scattered pattern throughout the county. These are light-colored soils developed under forest vegetation in a thin mantle of loess over a poorly drained, strongly gleyed paleosol (7). Fishhook soils developed in 20 to about 40 inches of loess; Atlas soils, in less than 20 inches of loess over a paleosol developed in glacial drift, possible lacustrine deposits, or fine-textured slope wash from glacial sediments.

Fishhook soils are mainly somewhat poorly drained, but in Stephenson County several areas that are moderately well drained were included. They have moderate permeability in the upper (loess) portion of the profile but are slowly permeable in the lower profile. They have moderate to high available water capacity.

Atlas soils are somewhat poorly, but occasionally poorly, drained. They have slow to very slow permeability and moderate available water capacity.

These soils occur on slopes ranging from 4 to 12 percent. Fishhook soils occur on the upper portions of the slopes and frequently at the base of slopes, and Atlas soils occur primarily in the center of the slopes, where the loess cover is the thinnest.

Associated soils include Flagg (419) and Pecatonica (21), which developed in loess and in well-drained reddish paleosols, and Fayette (280) and Rozetta (279), which developed in loess.

Two mapping units are shown on the soil map: 971C2 and 971D2. The units described are from areas representing maximum A horizon thickness.

Fishhook silt loam representative profile (part of 971C2)

A1 (0-3″) Very dark grayish-brown (10YR 3/2) silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 5.9.

A21 (3-7″) Brown (10YR 5/3) silt loam, light gray and very pale brown (10YR 7/2 and 7/3) when dry; very dark grayish-brown (10YR 3/2) channel fillings; strong, very fine to fine, platy structure; friable; clear, smooth boundary; pH 4.9.

A22 (7-10″) Brown (10YR 5/3) silt loam, very pale brown and pale brown (10YR 7/3 and 6/3) when dry; common light gray (10YR 7/2) silt coatings when dry; compound weak to moderate, medium, platy to moderate, medium to coarse, crumb structure; friable; clear, smooth boundary; pH 4.5.

B21t (10-18″) Yellowish-brown (10YR 5/4) light silty clay loam with few, thin, discontinuous dark yellowish-brown (10YR 4/4) clay coatings; common light gray (10YR 7/2) silt coatings when dry; very few very dark brown (10YR 2/2) iron-manganese concretions; strong, medium, subangular blocky structure; friable; clear, smooth boundary; pH 4.8.

B22t (18-24") Dark yellowish-brown (10YR 4/4) silty clay loam with common, fine, faint grayish-brown (10YR 5/2) and few, fine, faint yellowish-brown (10YR 5/6) mottles; few, thin, discontinuous dark brown (10YR 4/3) clay coatings; common light gray (10YR 7/2) silt coatings when dry; few very dark brown (10YR 2/2) iron-manganese concretions; strong, medium and coarse, subangular blocky structure; firm; clear, smooth boundary; pH 4.9.

B23t (24-30") Grayish-brown and brown (10YR 5/2 and 5/3) light silty clay loam with common, medium, distinct strong brown (7.5YR 5/8) and yellowish-red (5YR 5/8) mottles; discontinuous dark brown (10YR 3/3) clay coatings; numerous light gray (10YR 7/2) silt coatings when dry; few very dark brown (10YR 2/2) iron-manganese concretions; moderate, medium and coarse, subangular blocky structure; firm; abrupt, smooth boundary; pH 5.1.

IIA11b (30-33") Very dark gray (10YR 3/1) silty clay loam with few, medium, distinct brown to yellowish-brown (10YR 5/3 to 5/6) mottles; light gray (10YR 7/1) silt coatings when dry, abundant in upper part grading to common in lower part; moderate, medium, angular blocky structure; firm; clear, smooth boundary; pH 5.0.

IIA12b (33-42") Black to very dark gray (10YR 2/1 to 3/1) silty clay with few, fine, faint very dark grayish-brown to dark brown (10YR 3/2 to 3/3) and few, fine, distinct brown and strong brown (7.5YR 4/4 and 5/6) mottles; very few light gray (10YR 7/1) silt coatings; weak to moderate, coarse, angular blocky structure; very firm; clear, smooth boundary; pH 5.5.

IIA13b (42-53") Very dark gray to dark gray (10YR 3/1 to 4/1) light silty clay with common, medium, distinct dark yellowish-brown (10YR 4/4), brown (7.5YR 4/4), and strong brown (7.5YR 5/6) mottles; weak to moderate, coarse, angular blocky structure; very firm; clear, smooth boundary; pH 6.5.

IIB21gb (53-63") Dark gray and gray (10YR 4/1 and 5/1) heavy silty clay loam with few to common, distinct yellowish-brown to brownish-yellow (10YR 5/6 to 6/6) and few to common, prominent yellowish-red (5YR 4/6 and 4/8) mottles; thick, patchy very dark gray (10YR 3/1) clay coatings on vertical ped faces; weak, coarse, angular blocky structure; firm; clear, smooth boundary; pH 7.6.

Atlas silt loam representative profile (part of 971C2)

Ap (0-6") Very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, crumb to granular structure; friable; abrupt, smooth boundary; pH 5.7.

A2 (6-9") Dark yellowish-brown (10YR 4/4) silt loam; few iron-manganese stains; compound weak, fine, platy and moderate, fine, granular structure; friable; clear, smooth boundary; pH 5.5.

B21t (9-13") Dark yellowish-brown (10YR 4/4) silty clay loam with common, medium, faint grayish-brown (10YR 5/2) mottles; moderate to strong, fine, subangular blocky structure; slightly firm; clear, smooth boundary; pH 5.5.

B22t (13-16") Grayish-brown (10YR 5/2) silty clay loam with many, medium, distinct yellowish-brown (10YR 5/5) mottles; common light gray (10YR 6/1 to 7/1) silt coatings when dry; strong, fine to medium, subangular blocky structure; firm; abrupt, wavy boundary; pH 5.8.

IIA11b (16-19") Very dark gray (10YR 3/1) heavy silty clay loam with many light gray (10YR 7/1) silt coatings when dry; strong, fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.6.

IIA12b (19-30") Very dark gray (10YR 3/1) light silty clay; moderate, medium, angular blocky structure; firm to very firm; clear, smooth boundary; pH 5.6.

IIA13b (30-35") Very dark gray to dark gray (10YR 3/1 to 4/1) heavy silty clay loam with noticeable sand; few, fine, distinct dark yellowish-brown (10YR 4/4) mottles; moderate, medium, angular blocky structure; firm; clear, smooth boundary; pH 5.6.

IIB21gb (35-44") Gray (10YR 5/1) heavy clay loam with many, medium, distinct dark yellowish-brown (10YR 4/4) mottles and common very dark brown (10YR 2/2) iron-manganese concretions; moderate, medium to coarse, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

IIB22gb (44-59") Gray (10YR 5/1) heavy clay loam with many, medium, distinct yellowish-brown (10YR 5/6) mottles and common very dark brown (10YR 2/2) iron-manganese concretions; moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.5.

IIB3gb (59-67") Gray to light gray (10YR 6/1) clay loam with common, medium, distinct yellowish-brown (10YR 5/5) mottles; weak, medium to coarse, angular blocky structure; firm; abrupt, smooth boundary; pH 6.7.

Flagg Series (419)

The Flagg series consists of light-colored, well-drained soils developed in 30 to 50 inches of loess over a well-drained reddish paleosol developed in glacial drift, dominantly till, prior to loess deposition. These soils occur in upland areas developed under forest vegetation on slopes ranging from 2 to 12 percent.

Flagg soils are deep; they have moderate permeability and high to very high available water capacity.

Flagg soils occur on ridgetops in areas where Pecatonica (21) and Kidder soils (361), which have thin loess covers, occur on side slopes. In thicker loess areas, Flagg soils occur on side slopes in areas where Fayette (280) and Rozetta (279) occur on ridgetops. Flagg soils are distributed throughout the county but are found mostly in the eastern one-half.

Four mapping units are shown on the soil map: 419B, 419C, 419C2, and 419D2. The eroded mapping units have lost about one-half of the A horizons.

Flagg silt loam representative profile (419B)

A1 (0-4") Very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, crumb structure; friable; few wormcasts; pH 5.8; clear, smooth boundary.

A2 (4-11") Brown (10YR 4/3) silt loam; weak, thin, platy, breaking to moderate, fine, granular structure; friable; common wormcasts; pH 5.6; clear, smooth boundary.

B1 (11-17") Brown (7.5YR 4/4) light silty clay loam; moderate, fine, subangular blocky structure; firm; few specks of whitish silica on ped surfaces; pH 5.5; gradual, smooth boundary.

B21t (17-30") Brown (7.5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; firm; thin, discontinuous dark brown (7.5YR 3/2) clay films; pH 5.5; gradual, smooth boundary.

B22t (30-39") Brown (7.5YR 4/4) light silty clay loam; weak to moderate, medium, angular blocky structure; firm;

thin, discontinuous dark brown (7.5YR 3/2) clay films; common, small, dark-colored iron-manganese concretions; pH 5.7; clear, smooth boundary.

IIB23t (39-48″) Brown (7.5YR 5/4) silty clay loam with some sand; common, coarse, distinct strong brown (7.5 YR 5/8) mottles; moderate, medium and coarse, subangular blocky structure; firm; thin, almost continuous reddish-brown (5YR 4/3) clay films; pH 5.7; gradual, smooth boundary.

IIB24t (48-72″) Reddish-brown (5YR 4/4) clay loam; moderate, medium, subangular blocky structure; firm; thin, almost continuous dark reddish-brown (5YR 3/4) clay films; pH 5.7.

Griswold Series (363)

The Griswold series is made up of well-drained, dark-colored soils developed under grass vegetation from sandy loam glacial till. Occasionally, there is evidence of loess influence on surface horizons. There is only one mapping unit, 363D2.

Griswold soils have moderate permeability and moderate available water capacity.

Associated with Ogle (412) and Durand (416) soils, Griswold soils occur primarily in the eastern one-half of the county. Solum thickness is normally between 20 and 40 inches, varying greatly over short distances.

Griswold loam representative profile (363D2)

Ap (0-7″) Very dark brown and very dark grayish-brown (10YR 2/2 and 3/2) loam; moderate, medium, granular structure; friable; abrupt, smooth boundary; pH 7.0.

B21t (7-15″) Dark yellowish-brown (10YR 3/4) light clay loam; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 6.5; contains some fine gravel.

B22t (15-22″) Brown and dark yellowish-brown (10 YR 4/3 and 4/4) sandy clay loam to light loam; moderate, medium, subangular blocky structure with discontinuous dark brown (10YR 3/3) clay films; friable; clear, smooth boundary; pH 6.8; contains some gravel.

C (22-50″ +) Pale brown and light yellowish-brown (10YR 6/3 and 6/4) sandy loam till with some gravel; massive; very friable; calcareous.

Harpster Series (67)

The Harpster series consists of dark-colored, poorly drained soils developed under wet prairie or marsh grass in depressed to nearly level areas. They have developed in silty sediments that are probably water deposited, although some loess (wind-deposited silts) may be present. The presence of snail shells is a striking characteristic of this soil series.

Harpster soils are deep; they have moderate permeability and very high available water capacity.

These are inextensive soils usually occurring with Drummer (152), Elburn (198), and Sable (68) soils. Only one mapping unit, 67, is shown on the soil map.

Harpster silty clay loam representative profile (67)

Ap (0-8″) Black (10YR 2/1) light silty clay loam; moderate, medium, granular structure; friable; abrupt, smooth boundary; calcareous.

A12ca (8-15″) Black (10YR 1/1) silty clay loam; moderate, medium to fine, granular structure; firm; clear, smooth boundary; calcareous.

A13ca (15-21″) Black (10YR 1/1) silty clay loam (more clay than in A12ca horizon); strong, medium to fine, granular structure; firm; clear, smooth boundary; calcareous.

AB (21-24″) Very dark gray and black (10YR 3/1 and 2/1) silty clay loam with common, fine, distinct yellowish-brown (10YR 5/8) mottles; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; calcareous.

B2g (24-30″) Mixed dark gray, very dark gray, and yellowish-brown (10YR 4/1, 3/1, 5/6, and 5/8) silty clay loam with discontinuous very dark gray (10YR 3/1) clay coatings; moderate, medium to fine, prismatic, breaking to medium, subangular blocky structure; firm; clear, smooth boundary; calcareous; occasional iron-manganese concretions.

B3g (30-40″) Olive-gray (5Y 5/2) light silty clay loam with discontinuous dark gray (10YR 4/1) clay coatings and many, fine, distinct yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular and angular blocky structure; firm; gradual, smooth boundary; calcareous; occasional iron-manganese concretions.

Cg (40-60″ +) Gray (5Y 5/1) and light olive-brown (2.5Y 5/4) silt loam with common, fine, distinct yellowish-brown (10YR 5/6) mottles; massive; friable; calcareous; occasional iron-manganese concretions.

Snail shell fragments readily visible to 21 inches deep. Large fragments and few whole shells in A12ca horizon. Some krotovina present filled with black (10YR 1/1) material.

Harvard Series (344)

The Harvard series is composed of moderately dark, well- and moderately well-drained soils developed in loess or silty material less than 40 inches thick and in the underlying medium-textured, water-laid sediments. Developed under mixed prairie-forest vegetation in outwash areas and on stream benches or terraces, these soils occur over a wide slope range (0 to 12 percent).

Harvard soils are deep and moderately permeable; they have high available water capacity.

Associated soils include Camden (134), which have lighter colored surface horizons; Millbrook (219) and Virgil (104), which are somewhat poorly drained; and St. Charles (243) and Batavia (105), which have developed in thicker silts.

Five mapping units are shown on the soil map: 344A, 344B, 344C, 344C2, and 344D2. The eroded units have lost about one-half of the A horizon.

Harvard silt loam representative profile (344B)

A1 (0-8″) Very dark brown (10YR 2/2) silt loam with moderate, fine to medium, granular structure; friable; abundant roots; clear, smooth boundary; pH 7.5.

A21 (8-13″) Dark brown (10YR 4/3) silt loam; weak, thin, platy structure, breaking to moderate, very fine to fine, subangular blocky structure; friable; coatings of light gray (10YR 7/1), when dry, on ped surfaces; common wormcasts of very dark brown (10YR 2/2); abundant roots; clear, wavy boundary; pH 6.0.

A22 (13-16″) Dark yellowish-brown (10YR 4/4) and yellowish-brown (10YR 5/4) silt loam; moderate, fine, subangular blocky structure with a slight tendency towards weak, thin to medium, platy structure; friable; coatings of light gray (10YR 7/1), when dry, on ped surfaces; common very dark brown (10YR 2/2) wormcasts; common roots; abrupt, smooth boundary; pH 6.0.

B1t (16-22") Brown to dark yellowish-brown (10YR 4/3 to 4/4) heavy silt loam with moderate, fine to medium, subangular and angular blocky structure; friable; thin, discontinuous clay skins of dark brown (10YR 4/3); light gray (10YR 7/1), when dry, coatings on ped surfaces; common very dark brown (10YR 2/2) worm channels; common roots; clear, smooth boundary; pH 5.8.

B21t (22-26") Brown to yellowish-brown (10YR 5/3 to 5/4) light silty clay loam; strong, fine to medium, subangular blocky structure; firm; thick, continuous dark brown (10YR 4/3) clay skins; common very dark brown (10YR 2/2) wormcasts; a few, fine, faint yellowish-brown (10YR 5/6) mottles; light gray (10YR 7/1), when dry, coatings on ped surfaces; common roots; clear, smooth boundary; pH 5.5.

IIB22t (26-31") Brown to yellowish-brown (10YR 5/3 to 5/4) gritty silty clay loam; moderate, fine to medium, subangular blocky structure; firm; moderate, continuous dark brown (10YR 4/3) clay skins; common worm channels of very dark grayish brown (10YR 3/2); a few, fine, distinct strong brown (7.5YR 5/6 and 5/8) mottles; light gray (10YR 7/1), when dry, coatings on ped surfaces; common roots; clear, smooth boundary; pH 5.5.

IIB3t (31-42") Brown to yellowish-brown (10YR 5/3 to 5/4) heavy silt loam to loam; moderate, medium, subangular blocky structure; friable; thin, discontinuous dark brown (10 YR 4/3) clay skins; thick light gray (10YR 7/2) coatings on ped surfaces, white (10YR 8/1) when dry; common roots; abrupt, smooth boundary; pH 5.5.

IIC1 (42-68") Stratified layers of friable loam and fine sandy loam: yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), reddish brown (2.5YR 4/4), and dark reddish brown (5YR 3/2); thin, discontinuous dark brown to brown (10YR 4/3) clay skins on horizontal surfaces; thick light gray (10YR 7/2) coatings on ped surfaces, white (10YR 8/1) when dry; massive in place, breaking to moderate, medium to thick, platy and moderate, medium to coarse, angular blocky structure; occasional roots; pH 5.2.

IIC2 (68" +) Dark yellowish-brown (10YR 4/4) stratified loam to clay loam with a few, fine, limestone pebbles; friable; effervesces strongly.

Hitt Series (506)

The Hitt series consists of dark-colored, well-drained soils developed under grass vegetation in loess and glacial drift approximately 3 to 5 feet thick over limestone residuum over limestone.

Hitt soils are deep; they have moderate permeability and moderate available water capacity.

Occurring on upland slopes ranging from 2 to 12 percent, they are associated with Durand soils (416), which are developed in thin loess over glacial drift; Oneco (752) and Woodbine (410) soils, which have thinner, lighter colored A horizons; and Ashdale (411) and Dodgeville (40) soils, which are developed in loess only, over limestone residuum and bedrock. These soils occur most commonly in the eastern one-half of the county; the glacial drift is commonly till, but water-deposited material was included in mapping. Some weathering and soil development occurred in the glacial deposits prior to loess deposition. A few areas are included that do not have residuum over the limestone.

The four mapping units shown on the soil map are 506B, 506C, 506C2, and 506D2. The eroded mapping units have some B horizon mixed in the plow layer.

Hitt silt loam representative profile (506C)

Ap (0-8") Very dark brown (10YR 2/2) heavy silt loam; weak, medium to coarse, angular and subangular blocky structure; friable; abrupt, smooth boundary; abundant roots; pH 7.6.

B1 (8-13") Dark brown (10YR 3/3) to dark yellowish-brown (10YR 3/4) silty clay loam with occasional root or worm channel fillings of very dark brown (10YR 2/2); moderate, medium, angular and subangular blocky structure; firm; clear, smooth boundary; common roots; pH 5.5.

IIB21t (13-19") Dark brown (7.5YR 4/4) gritty silty clay loam to clay loam; moderate, medium, subangular blocky structure; clay films present; firm; clear, smooth boundary; common roots; pH 5.8.

IIB22t (19-27") Reddish-brown (5YR 4/4) clay loam with some ped interiors of yellowish red (5YR 4/6); moderate, medium, subangular blocky structure; clay films present; firm; clear, smooth boundary; common roots; pH 5.8.

IIB23t (27-39") Reddish-brown (5YR 4/4) clay loam with few, fine, distinct spots of black (5YR 2/1); moderate to strong, medium, subangular to angular blocky structure; clay films present; very firm; clear, smooth boundary; common roots; pH 6.0.

IIIB3 (39-44") Dark reddish-brown (5YR 3/3 and 3/4) clay; moderate, medium to coarse, angular blocky structure; very firm; abrupt, smooth boundary; occasional roots; pH 7.0.

R1 (44-47") Very pale brown (10YR 7/4) fine sand; single-grained structure in places but containing small chunks of solid rock and grading to solid limestone; loose; occasional roots; calcareous; this horizon is disintegrated dolomite.

R2 (47" +) Very pale brown (10YR 7/4) to yellow (10YR 7/8) dolomitic limestone; hard but shattered; calcareous.

Houghton Series (103)

The Houghton series is composed of very dark-colored, very poorly drained organic soils consisting of decomposed and partially decomposed deposits of grasses, sedges, and reeds that have accumulated in wet depressions and seepy spots, primarily in bottom or bench positions but occasionally in the upland.

Houghton soils are deep, if drained; they have moderate permeability and very high available water capacity.

These are not extensive soils. Occurring as small delineations, they are usually associated with Drummer (152), Sable (68), Sawmill (107), Radford (74), Otter (76), and Lena (210) soils. Most areas are level, but a few sloping areas are included, such as the area in Section 27, T26N, R7E (Florence Township). A few areas included with Houghton soils have loamy, mineral sediments at depths of less than 40 inches.

An area of Houghton muck occurs in the extreme foreground and is surrounded by Sawmill and Radford soils in Winneshiek Creek Valley. Upland areas in the background are occupied by soils developed in thin loess and glacial till. (Fig. 19)

Two mapping units are shown on the soil map: 103 and W103. The W103 unit is very wet and has a water table near the surface almost continuously.

Houghton muck representative profile (103)

Oa1 (0-9″) Black (10YR 1/1) muck; weak, fine, crumb structure; very friable; clear, smooth boundary; pH 7.0.

Oa2 (9-60″) Black (N 2/0) muck with thin 1- to 2-inch bands of very dark brown (10YR 2/2) peaty material at about 24 and 33 inches; massive; very friable; gradual, smooth boundary; pH 7.0.

Oa3 (60-75″ +) Black (N 2/0) muck with noticeably higher mineral content than above horizons; massive; friable; becomes calcareous at about 75 inches, grading into marly, mineral material.

Huntsville Series (77)

The Huntsville series is made up of dark-colored, moderately well- and well-drained soils consisting of recent sediments deposited in the flood plains of the major streams and in major drainageways of the uplands. These soils are developed in silty, or sometimes loamy, sediments on level to gently sloping areas.

These soils are deep and moderately permeable; they have very high available water capacity.

Occurring most extensively along the Pecatonica River, Huntsville soils are associated with the somewhat poorly drained Lawson (451), poorly drained Otter (76), and the finer textured and more poorly drained Sawmill (107) and Radford (74) soils.

The only mapping unit on the soil map is 77.

Huntsville silt loam representative profile (77)

Ap (0-9″) Black to very dark brown (10YR 2/1 to 2/2) heavy silt loam; very dark brown (10YR 2/2) when crushed; weak, fine, granular to crumb structure; friable; abundant roots; abrupt, smooth boundary; pH 7.0.

A12 (9-20″) Very dark brown (10YR 2/2) to very dark gray (10YR 3/1) silt loam with spots of very dark grayish brown (10YR 3/2); weak to moderate, medium, granular to crumb structure; friable; abundant roots; gradual, smooth boundary; pH 7.0.

A13 (20-30″) Very dark grayish-brown (10YR 3/2) silt loam; thin, discontinuous organic coatings of very dark brown (10YR 2/2); weak to moderate, medium, granular structure; friable; abundant roots; gradual, smooth boundary; pH 6.5.

A14 (30-42″) Very dark grayish-brown to dark brown (10YR 3/2 to 3/3) silt loam, dark brown (10YR 3/3) when crushed; thin, discontinuous very dark brown (10YR 2/2) organic coatings, fewer than in horizon above; weak, coarse, granular structure; friable; common roots; gradual, smooth boundary; pH 6.3.

C (42″ +) Dark brown (10YR 3/3) heavy silt loam with spots of dark brown to brown (10YR 4/3); massive, breaking to weak, coarse, granular structure; friable; common roots; pH 6.5.

Keller-Coatsburg Complex (970)

Keller-Coatsburg complex occurs in a scattered pattern throughout the county in small delineations. These dark-colored soils developed under grass vegetation, partly in loess and partly in a strongly gleyed, poorly drained paleosol. Keller soils have developed in 20 to about 40 inches of loess; Coatsburg soils, in less than 20 inches of loess over a poorly drained paleosol developed in glacial drift, possibly in lacustrine sediments, or in fine-textured slope wash from glacial sediments.

Keller soils are, for the most part, somewhat poorly drained, but in Stephenson County many areas were included that are moderately well drained. Keller soils have moderate permeability in the upper loess portion of the profile and slow permeability in the lower profile. They have moderate to high available water capacity.

Coatsburg soils are poorly, but occasionally somewhat poorly, drained. They have slow to very slow permeability and moderate available water capacity.

This complex occurs on slopes ranging from 4 to 12 percent. Keller soils occur mainly on the upper or lower portion of the slopes where the loess mantle is thickest, and Coatsburg soils tend to occur in the middle of the slopes. The paleosol will occasionally outcrop.

Associated soils include Ogle (412) and Durand (416), which are developed partially in loess and partially in well-drained reddish paleosols, and Tama (36), which is developed entirely in loess and is well and moderately well drained.

Two mapping units are shown on the soil map: 970C2 and 970D2. The units described are from areas representing maximum A horizon thickness.

Keller silt loam representative profile (part of 970C2)

Ap (0-9″) Very dark brown (10YR 2/2) silt loam; cloddy, breaking to weak, medium to coarse, granular structure; friable; clear, smooth boundary; pH 7.5.

A3 (9-13″) Very dark grayish-brown (10YR 3/2) silt loam with few, fine, faint gray (10YR 6/1) specks when dry; moderate, fine to medium, granular structure; friable; clear, smooth boundary; pH 6.0.

B1 (13-18″) Brown (10YR 4/3) heavy silt loam with common, fine, distinct light gray (10YR 7/1) specks when dry; moderate, fine, subangular blocky structure; friable; clear, smooth boundary; pH 5.2.

B21t (18-23″) Yellowish-brown (10YR 5/4) silty clay loam with thin clay patches of dark yellowish brown (10YR 4/4); many, fine, distinct light gray (10YR 7/1) specks when dry; moderate to strong, fine to medium, subangular blocky structure; firm; clear, smooth boundary; pH 5.1.

B22t (23-30″) Mixed yellowish-brown, light yellowish-brown, and grayish-brown (10YR 5/4, 6/4, and 5/2) silty clay loam with common, medium, prominent dark brown (7.5YR 4/4) and yellowish-red (5YR 4/6) mottles; few, fine, distinct black (10YR 2/1) iron-manganese stains; light gray to white (10YR 7/1 and 8/1) silt coatings covering as much as 80 percent of ped surfaces; strong, medium to coarse, subangular to angular blocky structure; firm; abrupt, smooth boundary; pH 5.3.

IIA1b (30-40″) Very dark gray and dark gray (2.5Y 3/0 and 4/0) silty clay with streaks and narrow bands of brown (10YR 5/3 and 7.5YR 4/4); moderate, medium, prismatic structure, breaking to coarse, angular blocky; very firm; clear, smooth boundary; pH 5.1.

IIB2b (40-51″) Dark brown (10YR 3/3) silty clay loam with few, fine, faint light gray (10YR 7/1) specks when dry; weak, coarse, angular blocky structure; firm; clear, smooth boundary; pH 5.8.

IIB31b (51-63″) Gray and grayish-brown (10YR 5/1 and 5/2) silt loam, very hard when dry, containing some pebbles; many, fine, distinct light gray (10YR 7/1) specks when dry; few, fine, distinct strong brown (7.5YR 5/6) mottles; massive in place, breaking to coarse, angular blocky structure; clear, smooth boundary; pH 6.0.

IIIB32b (63-73″) Mixed dark gray, dark grayish-brown, and grayish-brown (10YR 4/1, 4/2, and 5/2) light clay loam with many, fine, distinct light gray (10YR 7/1) specks when dry and common, medium, distinct strong brown (7.5YR 5/6) mottles; contains more gravel than horizon above; massive in place, breaking to coarse, angular blocky structure; firm; clear, smooth boundary; pH 6.4.

IIIB33b (73-103″) Mixed light brownish-gray, light gray, and black (10YR 6/2, 7/2, and 2/1) and strong brown (7.5YR 5/6) loam to light clay loam with common, fine, distinct light gray to white (10YR 7/1 to 8/1) specks when dry; massive; firm; pH 6.8. Contains chert and igneous pebbles and an occasional igneous boulder.

IIIC (103″ +) Pale yellow to yellow (2.5Y 7/4 to 7/6) sandy loam; very friable; calcareous. This horizon observed only on auger.

Coatsburg silt loam representative profile (part of 970C2)

Ap (0-7″) Black (10YR 2/1) silt loam; moderate, fine to medium, granular structure; friable; abrupt, smooth boundary; pH 7.8.

A12 (7-11″) Very dark brown (10YR 2/2) silt loam; moderate, medium, granular structure; friable; clear, smooth boundary; pH 5.5.

B1 (11-16″) Dark grayish-brown (10YR 4/2) silty clay loam; moderate, fine, subangular blocky structure with ped coatings of very dark grayish brown (10YR 3/2); firm; abrupt, smooth boundary; pH 5.8.

IIB21gt (16-21″) Very dark gray and very dark grayish-brown (10YR 3/1 and 3/2) silty clay; moderate to strong, fine, subangular blocky structure; very firm; clear, smooth boundary; pH 6.0.

IIB22gt (21-30″) Dark gray (10YR 4/1) silty clay with few, fine, faint dark grayish-brown (10YR 4/2) mottles; moderate, medium, angular and subangular blocky structure with patchy very dark gray (10YR 3/1) coatings; extremely firm; clear, smooth boundary; pH 6.0; noticeable sand.

IIB23gt (30-44″) Dark grayish-brown (10YR 4/2) silty clay with common, fine, distinct yellowish-brown (10YR 5/4 and 5/6) mottles; weak, medium, prismatic, breaking to moderate, medium to coarse, angular blocky structure with patchy gray (10YR 5/1) coatings; extremely firm; gradual, smooth boundary; pH 6.5; more sand than horizon above.

IIB31gt (44-53″) Gray and dark gray (10YR 5/1 and 4/1) heavy clay loam with common, medium, distinct strong brown (7.5YR 5/6 and 5/8) mottles; weak, medium, prismatic, breaking to weak, medium, angular blocky structure; very firm; clear, smooth boundary; pH 6.5.

IIIB32 (53-62″) Mixed grayish-brown and gray (10YR 5/2 and 6/1) and yellowish-brown (10YR 5/6 and 5/8) clay loam with occasional spots of very dark grayish brown (10YR 3/2); weak, medium, angular blocky structure; very firm; clear, smooth boundary; pH 7.0; occasional gravel.

IIIC1 (62-66″) Grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/6) clay loam with small areas of sandy loam; massive; firm; clear, smooth boundary; pH 8.0; occasional gravel.

IVC2 (66-77″ +) Yellowish-brown (10YR 5/6 and 5/8) heavy gritty silty clay loam with occasional spots of very dark grayish brown (10YR 3/2); massive; firm; pH 8.0; occasional pebbles, probably till.

Keltner Series (546)

The Keltner series is composed of dark-colored, well- and moderately well-drained soils developed under grass vegetation in shale uplands on slopes ranging from 2 to 12 percent. These soils are developed in loess 30 to 50 inches thick and in the underlying shale. The portion of the solum in shale is usually less than 12 inches thick.

Keltner soils have moderate permeability in the upper part of the solum and slow permeability in the underlying shale. Available water capacity is moderate to high.

These soils occur primarily in the southern portion of the county. They occur as far east as Ridott Township, northwest of German Valley, and on isolated shale knobs to the west. The largest acreage occurs in the larger shale areas south of Eleroy and south and west of Pearl City. Associated soils include Schapville (418) and Shullsburg (745), which occur in areas of thinner loess cover; Loran (572), which is somewhat poorly drained; and Eleroy (547) and Massbach (753), which have lighter colored and thinner A1 horizons.

Four mapping units are shown on the soil map: 546B, 546C, 546C2, and 546D2. The eroded units have some mixing of B horizon in the plow layer.

Keltner silt loam representative profile (546C)

Ap (0-8″) Black (10YR 2/1) silt loam; moderate, medium, granular structure; friable; light gray (10YR 7/2) silt coatings when dry; pH 6.7; abrupt, smooth boundary.

A3 (8-13") Very dark grayish-brown (10YR 3/2) heavy silt loam; weak to moderate, fine, granular structure; friable; pH 5.4; clear, smooth boundary.

B21t (13-20") Dark yellowish-brown (10YR 4/4) light silty clay loam; weak, fine, subangular blocky structure; firm; thin, continuous dark brown (10YR 4/3) clay films; pH 5.3; clear, smooth boundary.

B22t (20-27") Yellowish-brown (10YR 5/4) silty clay loam; many, medium, distinct light olive-brown (2.5Y 5/4) and few, fine, faint yellowish-brown (10YR 5/8) mottles; moderate, fine and medium, subangular blocky structure; firm; moderately thick brown (10YR 4/3) clay films; pH 5.4; clear, smooth boundary.

B23t (27-38") Dark grayish-brown (10YR 4/2) silty clay loam; many, medium, distinct yellowish-brown (10YR 5/8) and grayish-brown (2.5Y 5/2) mottles; moderate to strong, medium, subangular blocky structure; firm; moderately thick, continuous grayish-brown (10YR 5/2) clay films; many iron-manganese concretions; pH 6.0; abrupt, smooth boundary.

IIB3t (38-40") Mixed light olive-brown (2.5Y 5/4) and greenish-gray (5G 6/1) and some yellowish-brown (10Y 5/8) clay; moderate, medium and coarse, angular blocky structure; very firm; thin, discontinuous olive-gray (5Y 5/2) clay films; pH 7.2; gradual, smooth boundary.

IIC (40-60" +) Mixed olive (5Y 5/3), greenish-gray (5BG 6/1), and yellowish-brown (10YR 5/8) clay shale; massive; numerous chunks of limestone in discontinuous layers averaging 1 to 3 inches thick; calcareous.

Kendall Series (242)

The Kendall series consists of light-colored, somewhat poorly drained soils developed under deciduous forest on nearly level to gently sloping (0 to 4 percent) areas. These soils are developed in loess or silty material 3 to 5 feet thick and in the underlying medium-textured water-deposited sediments. They occur on stream benches and terraces and in upland, outwash areas.

Kendall soils are deep; they have moderate permeability and high to very high available water capacity.

They are most commonly associated with St. Charles (243) soils, which have better natural drainage, and Camden (134) soils, which have better natural drainage and a thinner silt cover. Kendall soils are developed in parent materials similar to those of Virgil (104) and Elburn (198) soils but have thinner and lighter colored surface horizons. These soils occur most frequently on low benches along the Pecatonica River. A few areas included are on benches where silty material exceeds 5 feet in thickness; these areas are similar to Stronghurst (278) soils.

The two mapping units shown on the soil map, 242A and 242B, differ only in slope of the area.

Kendall silt loam representative profile (242A)

Ap (0-7") Dark gray (10YR 4/1) silt loam, light gray (10YR 6/1 and 7/1) when dry; weak, fine, crumb structure in upper 3 inches; weak, fine and medium, platy structure in lower 4 inches; friable; common, fine, prominent yellowish-red (5YR 4/6) mottles and stains; abundant roots; abrupt, wavy boundary; pH 7.0.

A21 (7-12") Mixed light brownish-gray (2.5Y 6/2) and light gray (2.5Y 7/2) silt loam; strong, fine, platy structure; friable; many, fine, prominent strong brown (7.5YR 5/6) and yellowish-red (5YR 4/8) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; worm and root channel fillings of dark gray (10YR 4/1); common roots; clear, smooth boundary; pH 6.0.

A22 (12-18") Mixed 60-percent light brownish-gray and light gray (2.5Y 6/2 and 7/2) and 40-percent brown and strong brown (7.5YR 5/4 and 5/6) silt loam; weak, medium, platy structure in place; breaks out to moderate, fine, subangular blocky structure; friable; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; a few dark gray (10 YR 4/1) worm and root channel fillings; common roots; clear, smooth boundary; pH 5.5.

B1t (18-22") Mixed 60-percent light brownish-gray (2.5 Y 6/2) and 40-percent brown and strong brown (7.5YR 5/4 and 5/6) light silty clay loam; moderate, fine and medium, subangular blocky structure; firm; few, fine, prominent reddish-brown (5YR 4/3) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, discontinuous grayish-brown (2.5Y 5/2) clay coatings; a few dark gray (10YR 4/1) worm and root channel fillings; common roots; clear, smooth boundary; pH 5.3.

B21t (22-34") Mixed 50-percent grayish-brown and light brownish-gray (2.5Y 5/2 and 6/2) and 50-percent strong brown and dark brown to brown (7.5YR 5/6 and 4/4) silty clay loam; moderate, fine and medium, angular and subangular blocky structure; firm; few, fine, distinct yellowish-red (5YR 5/8) and yellowish-brown (10YR 5/8) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, discontinuous brown (7.5YR 5/4) clay coatings; few dark grayish-brown (2.5Y 4/2) and dark gray (10YR 4/1) worm and root channel fillings; common roots; clear, smooth boundary; pH 5.0.

B22t (34-43") Mixed 40-percent light brownish-gray (2.5Y 6/2) and 60-percent strong brown and dark brown to brown (7.5YR 5/6 and 4/4) silty clay loam; weak, medium and coarse, angular blocky structure; firm; few, fine, distinct yellowish-red (5YR 5/8) and yellowish-brown (10YR 5/8) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, discontinuous brown (7.5YR 5/2) clay coatings; a few dark grayish-brown (2.5Y 5/2) and dark gray (10YR 4/1) worm and root channel fillings; common roots; gradual, smooth boundary; pH 5.0.

B31 (43-50") Mixed 50-percent grayish-brown (2.5Y 5/2) and 50-percent dark brown to brown and strong brown (7.5YR 4/4 and 5/6) heavy silt loam; weak, coarse, angular blocky structure; firm; a few, fine, distinct yellowish-red (5YR 5/8 and 4/6) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, discontinuous brown (7.5YR 5/2) clay coatings; occasional roots; gradual, smooth boundary; pH 5.0.

IIB32 (50-55") Mixed 60-percent grayish-brown (2.5Y 5/2) and 40-percent strong brown (7.5YR 5/6) heavy loam and silt loam; weak, coarse, angular blocky structure; friable; few, fine, distinct yellowish-red (5YR 4/6) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, discontinuous brown (7.5YR 5/2) clay coatings; occasional roots; gradual, smooth boundary; pH 5.3.

IIC (55-60" +) Mixed 60-percent light brownish-gray (2.5Y 6/2) and 40-percent strong brown (7.5YR 5/6) stratified silt loam, loam, and fine sandy loam; massive in place, breaking into weak, coarse, angular blocky structure; friable; a few, fine, distinct yellowish-red (5YR 4/6) mottles; a few, fine, distinct iron-manganese stains, no concretions; occasional, thin, brown (7.5YR 5/2) clay coatings; occasional roots; pH 5.5.

Kidder Series (361)

The Kidder series consists of light-colored, well-drained soils developed in sandy loam textured till that may have some loess mixed with the surface horizons. They occur on upland slopes ranging from about 7 to 18 percent and have developed under forest vegetation.

Kidder soils are moderately permeable and have moderate available water capacity.

These soils, which are not extensive, occur primarily in the eastern part of the county in association with Pecatonica (21), Westville (22), and Flagg (419) soils. Kidder soils have thinner sola, often less than 3 feet thick, than the associated soils. Some areas are included on the soil map that have more loess influence than the profile described.

Two mapping units are shown on the soil map: 361D2 and 361D3. The 361D2 mapping unit has a slope range of 7 to 18 percent, which is a departure from the normal range of 7 to 12 percent for D slope units. The severely eroded unit (361D3) has a plow layer consisting mainly of B horizon. The representative profile has a maximum A horizon thickness for the mapping unit.

Kidder loam representative profile (361D2)

A1 (0-5") Very dark grayish-brown (10YR 3/2) loam to silt loam; weak, very fine, crumb structure; friable; clear, smooth boundary; pH 7.0.

A2 (5-10") Dark grayish-brown (10YR 4/2) loam to silt loam with some wormcasts of very dark brown (10YR 2/2); moderate, thin, platy structure; friable; clear, smooth boundary; pH 6.6.

B1t (10-13") Dark yellowish-brown (10YR 3/4) light clay loam; few, thin, dark yellowish-brown (10YR 3/4) clay coatings; moderate, fine, subangular blocky structure; slightly firm; clear, smooth boundary; few chert fragments and stones; pH 6.4.

B2t (13-23") Brown (7.5YR 4/4) sandy clay loam; few, thin, dark brown (7.5YR 3/4) clay coatings; moderate, medium, subangular blocky structure; firm; abrupt, wavy boundary; few gravels and chert fragments; pH 6.1.

B3t (23-26") Brown (7.5YR 4/4) heavy sandy clay loam; thick, discontinuous dark reddish-brown (5YR 3/3) clay coatings; moderate, fine, subangular blocky structure; firm; abrupt, wavy boundary; pH 6.8.

C (26" +) Yellowish-brown (10YR 5/4) sandy loam till; few, large, faint dark yellowish-brown (10YR 3/4) and few, fine, prominent strong brown (7.5YR 5/6) mottles; massive; very friable; strongly effervescent.

Lawson Series (451)

The Lawson series is made up of dark-colored, somewhat poorly drained soils developed in recently washed-in silty sediments from loess-mantled uplands. They occur on the flood plains of the major streams and in drainageways fingering into the upland on nearly level topography. These soils occur extensively in the county.

Lawson soils are deep and moderately permeable; they have very high available water capacity.

Darker colored and more poorly drained than the associated Huntsville (77) soils, Lawson soils are better drained than Otter (76) soils. They are more silty and better drained than the Sawmill (107) and Radford (74) soils. Orion (415) soils are similar to Lawson soils but are derived from lighter colored sediments. Dorchester soils (239) differ in being calcareous.

Only one mapping unit, 451, is shown on the soil map. Included with Lawson are some areas where black silty clay loam sediments occur above 40 inches, some areas that contain loamy lenses, and some areas that are lighter colored than the representative profile.

Lawson silt loam representative profile (451)

Ap (0-7") Black (10YR 2/1) silt loam, very dark brown (10YR 2/2) when crushed; massive in place, breaking to weak, medium and coarse, angular blocky structure; firm; black (10YR 2/1) worm and root channels; common roots; abrupt, smooth boundary; pH 7.0.

A12 (7-25") Black (10YR 1/1) silt loam, black (10YR 2/1) when crushed; weak and moderate, fine and medium, granular structure; friable; few, fine, distinct yellowish-red (5YR 4/6) mottles; black (10YR 1/1) root and worm channels; common roots; clear, smooth boundary; pH at 10 inches is 7.0; pH at 22 inches is 6.7.

A13 (25-31") Mixed black (10YR 2/1) and very dark gray (10YR 3/1) silt loam, very dark brown (10YR 2/2) when crushed; weak, fine and medium, subangular blocky structure; friable; black (10YR 2/1) wormcasts and organic coatings; common, fine, distinct yellowish-red (5YR 4/6) mottles; common roots; clear, smooth boundary; pH 6.7.

C (31-60" +) Very dark gray (10YR 3/1) silt loam, very dark brown (10YR 2/2) when crushed; weak, medium and coarse, subangular blocky structure; friable; many, fine, distinct dark brown (7.5YR 3/2) mottles; many, fine, faint very dark brown (10YR 2/2) mottles; a few, fine, distinct yellowish-red (5YR 4/6) mottles; a few black (10YR 2/1) organic coatings; occasional roots; pH at 35 inches is 7.3; pH at 46 inches is 7.5.

Lena Series (210)

The Lena series consists of dark-colored, very poorly drained organic soils. Occurring mainly in the bottomlands or on low stream benches, they are minor soils in the county. They consist of decomposed and partially decomposed residues of reeds, sedges, and water-loving grasses. Snail shells are present in varying amounts and may impart a grayish or whitish cast to the surface.

Lena soils are deep when drained; they have moderate permeability and very high available water capacity.

They occur in level areas or in depressions where the water table has been high for a long period or where there is a constant water supply through seepage. Associated soils include Houghton (103), which does not contain snail shells, and Drummer (152), Radford (74), Sawmill (107), Otter (76), and Millington (82) soils, all of which contain more mineral and less organic matter.

Only one mapping unit, 210, is shown on the soil map. Included in this unit are some small areas that are very wet and a few areas that have mineral material occurring at less than 50 inches.

Lena muck representative profile (210)

Oa1 (0-12") Black (N 2/0) muck with a few white (N 8/0) snail shell fragments; weak, fine, crumb structure; very friable; clear, smooth boundary; calcareous.

Oa2 (12-52") Black (N 2/0) peaty muck with some dark brown (10YR and 7.5YR 3/3) plant remains and a few white (N 8/0) snail shell fragments; massive; friable; clear, smooth boundary; calcareous.

Cg (52-60" +) Greenish-gray (5GY 5/1) loam; massive; friable; calcareous.

Loran Series (572)

The Loran series is made up of dark-colored, somewhat poorly drained soils developed under grass vegetation in loess 30 to 50 inches thick and in the underlying shale bedrock. These soils occur on gently to moderately sloping (2 to 7 percent) topography in shale uplands. Isolated shale areas occur across the southern portion of the county; the larger areas occur south of Eleroy and south and west of Pearl City.

Loran soils have moderate permeability in the upper solum but slow permeability in the underlying shale. Available water capacity varies from moderate to high.

They are most closely associated with Keltner (546) and Schapville (418) soils, which have better natural drainage, and Shullsburg soils (745), which have a thinner loess cover over the shale bedrock. Although similar to Ridott (743), Loran soils have thicker, darker surface horizons and lack an A2 horizon.

Two mapping units are shown on the soil map: 572B and 572C.

Loran silt loam representative profile (572C)

Ap (0-6") Black (10YR 2/1) silt loam, very dark gray (10YR 3/1) when dry; moderate, medium, granular structure; friable; pH 7.0; abrupt, smooth boundary.

A12 (6-13") Black (10YR 2/1) heavy silt loam, very dark gray (10YR 3/1) when dry; moderate, medium, granular structure; friable but compact; pH 7.0; clear, smooth boundary.

B1t (13-17") Very dark grayish-brown (10YR 3/2) and dark grayish-brown (10YR 4/2) silty clay loam with very dark gray (10YR 3/1) coatings; moderate, fine and medium, subangular blocky structure; firm; pH 7.0; clear, smooth boundary.

B21t (17-21") Dark grayish-brown (10YR 4/2) silty clay loam with few, fine, faint dark yellowish-brown (10YR 4/4) mottles; moderate to strong, fine and medium, subangular blocky structure; firm; discontinuous very dark grayish-brown (10YR 3/2) clay films; numerous black (10YR 2/1) iron-manganese concretions; pH 7.0; clear, smooth boundary.

B22t (21-29") Dark grayish-brown (2.5Y 4/2) and grayish-brown (2.5Y 5/2) silty clay loam with few, fine, distinct yellowish-brown (10YR 5/6) mottles; weak, prismatic, breaking to moderate, fine and medium, subangular blocky structure; firm; discontinuous dark gray (10YR 4/1) clay films; numerous black (10YR 2/1) iron-manganese concretions; pH 7.3; clear, smooth boundary.

B31t (29-38") Grayish-brown (2.5Y 5/2) heavy silt loam with common, fine, distinct yellowish-brown (10YR 5/8) and brownish-yellow (10YR 6/8) mottles; weak, medium and coarse, prismatic, breaking to weak to moderate, medium, subangular blocky structure; firm; discontinuous dark grayish-brown (2.5Y 4/2) clay films; numerous black (10YR 2/1) iron-manganese concretions; pH 7.3; abrupt, smooth boundary.

IIB32t (38-40") Mixed yellowish-brown (10YR 5/6), brown (7.5YR 5/4), and strong brown (7.5YR 5/6) clay loam; weak, coarse, angular blocky structure; firm; few black (10 YR 2/1) stains and iron-manganese concretions; pH 7.3; abrupt, smooth boundary.

IIIB33 (40-45") Mixed greenish-gray (5GY 5/1, 5GY 6/1, and 5G 6/1) clay; weak, medium, prismatic structure; extremely firm; weakly calcareous; slight effervescence; gradual, smooth boundary.

IIIC (45-60") Mixed greenish-gray (5GY 5/1, 5GY 6/1, and 5G 6/1) clay with spots and streaks of yellow (10YR 7/8 and 8/6); massive; extremely firm; calcareous; strong effervescence.

Massbach Series (753)

The Massbach series consists of moderately dark-colored, well- and moderately well-drained soils developed partly in loess 30 to 50 inches thick and partly in clayey shale bedrock. They developed in transitional prairie-forest upland areas on slopes ranging from 2 to 12 percent. Only a small portion of the solum is derived from shale.

These soils have moderate permeability in the upper solum but slow permeability in the underlying shale. They have moderate to high available water capacity.

Massbach soils have thinner and lighter colored surface horizons than Keltner soils (546) but thicker, darker A horizons than Eleroy soils (547). Although associated with Ridott (743) soils, Massbach soils have better natural drainage. They occur with several other soils derived partly from loess and partly from shale parent materials, primarily in the larger shale upland areas south and west of Pearl City and south of Eleroy.

The four mapping units shown on the soil map are 753B, 753C, 753C2, and 753D2. The eroded mapping units have some mixing of B horizon in the plow layer.

Massbach silt loam representative profile (753B)

A1 (0-7") Very dark gray (10YR 3/1) silt loam, very dark gray (10YR 4/2) when dry and very dark grayish brown (10YR 3/2) when crushed; moderate, fine and medium, crumb structure; friable; abundant roots; pH 7.0; clear, smooth boundary.

A2 (7-11") Dark grayish-brown (10YR 4/2) and brown (10YR 4/3) silt loam; moderate, fine and medium, crumb structure; friable; specks of light gray (10YR 7/1) that disappear when moist; abundant roots; pH 6.5; clear, smooth boundary.

B1 (11-14") Dark brown to brown and dark yellowish-brown (10YR 4/3 and 4/4) light silty clay loam; moderate, fine, subangular blocky structure; firm; few light gray (10YR 7/1) specks that disappear when moist; abundant roots; pH 6.0; clear, smooth boundary.

B21t (14-24") Dark brown to brown (10YR 4/3) silty clay loam; moderate, fine and medium, subangular blocky structure; firm; continuous dark brown (10YR 3/3) clay films; plentiful roots; few light gray (10YR 7/1) specks that disappear when moist; pH 6.0; clear, smooth boundary.

B22t (24-33″) Dark yellowish-brown (10YR 4/4) silty clay loam slightly heavier than in B21t horizon; moderate, fine and medium, subangular blocky structure; firm; thin, discontinuous dark brown to brown (10YR 4/3) clay films; common wormcasts of very dark gray (10YR 3/1); plentiful roots; few light gray (10YR 7/1) specks that disappear when moist; pH 5.6; clear, smooth boundary.

B31t (33-39″) Dark yellowish-brown (10YR 4/4) silty clay loam slightly lighter than in B22t horizon; moderate, fine and medium, subangular blocky structure; firm; thin, discontinuous dark brown to brown (10YR 4/3) clay films; few black (10YR 2/1) iron-manganese stains and concretions; few fine roots; few light gray (10YR 7/1) specks that disappear when moist; pH 5.6; abrupt, smooth boundary.

IIB32t (39-46″) Pale olive (5Y 6/4) silty clay with common, medium, distinct strong brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; very firm; thin, discontinuous dark brown to brown (10YR 4/3) clay films; few fine roots; pH 6.6; abrupt, smooth boundary. This horizon is mostly weathered shale.

IIC (46-60″ +) Pale olive (5Y 6/4), yellowish-brown (10YR 5/8), and brownish-yellow (10YR 6/8) silty clay to clay; massive; very firm; calcareous shale; effervesces strongly.

Miami Series (27)

The Miami series is composed of light-colored, well-drained soils developed partly in loess less than 18 inches thick and partly in loam-textured glacial till. These soils have developed on upland slopes ranging from 4 to 18 percent under forest vegetation. The thickness of the solum ranges from 2 to 3½ feet.

Miami soils have moderate permeability and high available water capacity.

These soils occur in a scattered pattern with no large continuous areas in the county. Some of the larger areas occur east of Freeport, north of the Pecatonica River. Included with Miami soils were some areas that have a thicker loess mantle and a few areas in which the solum thickness is less than 2 feet. In some areas the till texture is approaching sandy loam.

Most commonly associated soils are Octagon (656), which have slightly darker surface horizons, and Pecatonica (21), which have thicker sola. Also associated are Myrtle (414) and Flagg (419) soils, which have a thicker loess mantle, and Camden soils (134), which are developed from water-deposited sediments instead of glacial till.

Four mapping units are shown on the soil map: 27C2, 27D2, 27D3, and 27E2. The eroded units normally have some mixing of B horizons with the plow layer. The severely eroded unit, 27D3, has a plow layer that is mostly B horizon. The representative profile is from an area that has maximum thickness of A horizons.

Miami silt loam representative profile (27D2)

A1 (0-3″) Dark gray (10YR 4/1) gritty silt loam; moderate, very fine to fine, crumb structure; friable; clear, smooth boundary; pH 7.0.

A2 (3-10″) Dark grayish-brown (10YR 4/2) gritty silt loam, light brownish gray (10YR 6/2) when dry; numerous silt coatings of light gray (10YR 7/1); moderate, fine, platy structure; friable; clear, smooth boundary; pH 7.0.

IIB1 (10-14″) Dark brown (10YR 4/3) light clay loam with numerous silt coatings of light gray (10YR 7/1) when dry; moderate, fine, subangular blocky structure; friable to firm; clear, smooth boundary; pH 6.5.

IIB2t (14-22″) Dark brown (7.5YR 4/4) clay loam with few spots of strong brown (7.5YR 5/6); few clay coats of dark brown (7.5YR 4/3); few silt coatings of light gray (10 YR 7/1) when dry; moderate to strong, medium to fine, subangular blocky structure; clear, smooth boundary; pH 6.0.

IIB3t (22-30″) Dark brown (7.5YR 4/4) clay loam with spots of strong brown (7.5YR 5/6) and discontinuous clay coatings of dark brown (7.5YR 4/2); moderate, medium, angular and subangular blocky structure; firm; clear, smooth boundary; pH 7.0.

IIC (30-60″ +) Yellowish-brown (10YR 5/4) to light yellowish-brown and brownish-yellow (10YR 6/4 and 6/6) heavy loam; massive; firm; calcareous.

Millbrook Series (219)

The Millbrook series consists of moderately dark-colored, somewhat poorly drained soils developed in transitional prairie-forest areas on nearly level topography. These soils are developed partly in loess or silty sediments less than 40 inches thick and partly in stratified, medium-textured, water-deposited materials. Sola are normally 3½ feet thick or more.

Millbrook soils are deep; they have moderate permeability and high available water capacity.

These soils occur primarily on benches or terraces along the major streams with Virgil (104), Camden (134), St. Charles (243), and Harvard (344) soils. A few areas are included in the mapping that occur on slopes exceeding 2 percent. A few areas have surface colors that may be either darker or lighter colored than is typical for Millbrook soils.

The only mapping unit shown on the soil map is 219.

Millbrook silt loam representative profile (219)

Ap (0-8″) Very dark grayish-brown (10YR 3/2) silt loam; weak, medium and coarse, subangular blocky structure, breaking to fine and medium, crumb structure; friable; pH 6.3; abrupt, smooth boundary.

A2 (8-11″) Grayish-brown (10YR 5/2) silt loam; few, fine, distinct yellowish-brown (10YR 5/6) mottles; weak, medium, platy structure, breaking to moderate, medium, crumb structure; friable; common, medium, black (N 2/0) iron-manganese concretions; many root channel fillings of very dark grayish brown (10YR 3/2); pH 6.1; clear, smooth boundary.

B21t (11-15″) Grayish-brown (10YR 5/2) silty clay loam; few, fine, distinct yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure, breaking to moderate, medium, subangular blocky structure; firm; discontinuous dark grayish-brown (10YR 4/2) clay films; common, fine and medium, black (N 2/0) iron-manganese concretions; pH 6.5; clear, smooth boundary.

B22t (15-25″) Brown (10YR 5/3) silty clay loam; few, fine, distinct yellowish-brown (10YR 5/6) and few, fine, prominent strong brown (7.5YR 5/6) mottles; moderate, medium, prismatic structure, breaking to moderate, medium, subangular blocky structure; firm; continuous dark grayish-brown (10YR 4/2) clay films; common, fine, black (N 2/0) iron-manganese concretions; pH 6.5; abrupt, smooth boundary.

IIB23t (25-31″) Grayish-brown (10YR 5/2) clay loam; few, fine, prominent brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; weak, medium and coarse, prismatic structure, breaking to weak, medium and coarse, subangular blocky structure; firm; discontinuous brown (7.5YR 4/2) clay films; common black (N 2/0) iron-manganese concretions; pH 6.5; clear, smooth boundary.

IIB24t (31-36″) Mixed brown (10YR 5/3), yellowish-brown (10YR 5/4), brownish-gray (10YR 6/2), brown (7.5YR 4/4), and strong brown (7.5YR 5/6) sandy clay loam; weak, coarse, subangular blocky structure; firm; discontinuous dark brown (7.5YR 3/2) clay films; coarse black (5Y 2/2) iron stains; pH 6.0; clear, smooth boundary.

IIB3 (36-45″) Mixed grayish-brown (10YR 5/2) and brown (10YR 5/3) sandy loam; few, fine, prominent yellowish-red (5YR 4/6 and 5/8) mottles; weak, coarse, subangular blocky structure; friable; patchy dark brown (7.5YR 3/2) clay films; pH 6.0; gradual, smooth boundary.

IIC (45-60″ +) Mixed dark yellowish-brown (10YR 4/4), yellowish-brown (10YR 5/4 and 5/6), and light yellowish-brown (10YR 6/4) sandy loam with lenses of loamy sand; massive; friable; pH 6.5.

Millington Series (82)

The Millington series is composed of dark-colored, poorly drained soils developed in silty and loamy sediments deposited on the flood plains of streams. These soils occur to a very small extent in the county. Although Millington soils have no particular pattern of occurrence, they are found in level, wet areas. They are calcareous throughout the profile, which contains numerous snail shells and fragments.

Millington soils are deep; they have moderate permeability and high available water capacity.

Associated soils are Otter (76), Sawmill (107), Radford (74), Lawson (451), and Lena muck (210).

One mapping unit, 82, is shown on the soil map.

Millington silt loam representative profile (82)

A11 (0-17″) Very dark gray (10YR 3/1) silt loam; moderate, fine and medium, granular structure; friable; abrupt, smooth boundary; calcareous; strongly effervescent; many white snail-shell fragments present.

A12 (17-27″) Black (N 2/0) silt loam; very high organic matter content; massive; very friable; clear, smooth boundary; calcareous; strongly effervescent; many white snail-shell fragments present.

A13 (27-35″) Black (N 2/0) gritty silt loam with bands of light gray (10Y 7/1) and gray (10YR 6/1) loam; many snail-shell fragments; massive; very friable; clear, smooth boundary; calcareous; strongly effervescent.

C1 (35-41″) Mixed light olive-gray (5Y 6/2) and reddish-brown (5YR 4/4) stratified silt loam and loam with a few specks of red (10YR 4/6 and 10R 4/8); massive; clear, smooth boundary; calcareous; strongly effervescent; few white snail-shell fragments present.

C2g (41-60″) Mixed olive-gray (5Y 5/2), light olive-gray (5Y 6/2), and gray (5Y 5/1) loam; few, fine, distinct yellowish-brown (10YR 5/8) and light olive-brown (2.5Y 5/6) mottles; massive; calcareous; slightly effervescent; few white snail-shell fragments.

Morley Series (194)

The Morley series consists of light-colored, moderately well- and well-drained soils developed under forest vegetation on upland slopes ranging from 4 to 18 percent. These soils are developed in loess less than 2 feet thick and silty clay loam glacial till, or they are developed entirely in till. Solum thickness is usually between 2 and 3½ feet. A few areas with thicker sola are included in mapping. In places the till texture is silty clay.

Morley soils have moderately slow to slow permeability and high available water capacity.

The pattern of occurrence of these soils is spotty in the county; the most concentrated areas tend to be adjacent to some of the shale uplands, which probably were source areas for the high clay content of the glacial till in Morley areas. Examples of this are the Morley areas near the shale ridge at Waddams Grove and the spotty pattern of Morley soils in and adjacent to the shale uplands in the Eleroy area and southward.

Associated soils include Birkbeck (233), which often occurs on ridges above Morley slopes; Varna (223) soils, which have darker colored surface horizons; and Miami (27), which has less clay in the glacial-till parent materials.

The four mapping units shown on the soil map are 194C, 194C2, 194D2, and 194E2. The eroded units have lost about one-half of the A horizon. The profile described represents maximum A horizon thickness.

Morley silt loam representative profile (194D2)

Ap (0-7″) Dark grayish-brown (10YR 4/2) silt loam; weak, medium and coarse, crumb structure; friable; abrupt, smooth boundary; pH 6.7.

A2 (7-9″) Brown (10YR 5/3) silt loam with dark grayish-brown (10YR 4/2) root channel fillings; weak, thin, platy structure; friable; abrupt, smooth boundary; pH 6.3.

B1t (9-12″) Dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4) light silty clay loam; weak, fine and medium, subangular blocky structure; friable; abrupt, smooth boundary; pH 6.5.

IIB21t (12-21″) Dark brown (7.5YR 4/4) to dark yellowish-brown (10YR 4/4) light silty clay; few, fine, distinct black (10YR 2/1) iron-manganese stains; compound moderate, fine, prismatic and moderate, fine and medium, subangular blocky structure; thin, discontinuous clay films; very firm; clear, smooth boundary; pH is 6.6 in upper part, increasing to slightly calcareous in lower part; occasional till pebble.

IIB22t (21-32″) Mixed brown to dark brown (10YR 4/3), dark yellowish-brown (10YR 4/4), and yellowish-brown (10YR 5/4) silty clay loam; discontinuous dark grayish-brown (10YR 4/2) and very dark grayish-brown (10YR 3/2) clay coats on vertical ped surfaces (clay coats more evident in lower part of this horizon); compound strong, fine and medium, prismatic and strong, fine and medium, subangular blocky structure; firm; clear, smooth boundary; calcareous; slightly effervescent; till pebbles present.

IIC (32-50" +) Mixed yellowish-brown (10YR 5/4), pale brown (10YR 6/3), and light yellowish-brown (10YR 6/4) silty clay loam; common, fine, faint yellowish-brown (10YR 5/8) mottles; nearly massive with tendency toward coarse, angular blocky structure; firm; calcareous; strongly effervescent; till pebbles present.

Muscatine Series (41)

The Muscatine series is made up of somewhat poorly drained, dark-colored soils developed entirely in loess under grass vegetation. They occur mainly in the upland on nearly level to gently sloping topography.

Muscatine soils are deep; they have moderate permeability and a very high available water capacity.

They are representative of the most productive soils in the county and occur on the more level prairie areas northwest of Lena, west and north of Waddams Grove, in portions of Kent Township, and in parts of all townships across the southern portion of the county from Loran Township east. They are most commonly associated with Tama soils (36), which have better natural drainage, and with Sable soils (68), which are poorly drained and have a silty clay loam surface texture.

Two mapping units, 41 and 41B, are shown on the soil map.

Muscatine silt loam representative profile (41)

A11 (0-12") Black (10YR 2/1) silt loam; moderate, fine to medium, granular structure; friable; abundant roots; clear, smooth boundary; pH 7.0.

A12 (12-16") Very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) when dry; many black (10YR 2/1) and dark brown (10YR 4/3) wormcasts; common light gray (10YR 7/1) silt coatings when dry; moderate, fine, subangular blocky structure; friable; abundant roots; clear, smooth boundary; pH 6.0.

B1t (16-22") Very dark grayish-brown (10YR 3/2) silty clay loam; few black (10YR 2/1) and dark brown (10YR 4/3) wormcasts; common light gray (10YR 7/1) silt coatings when dry; thin, discontinuous clay films; moderate, medium to fine, subangular blocky structure; firm; common roots; clear, smooth boundary; pH 5.2.

B21t (22-29") Dark grayish-brown (10YR 4/2) silty clay loam; few, fine, distinct brownish-yellow and yellowish-brown (10YR 5/6 and 6/6) mottles; few black (5YR 2/1) iron and manganese concretions; thin, continuous clay films; moderate, fine to medium, subangular blocky structure; firm; common roots; clear, smooth boundary; pH 5.2.

B22t (29-41") Dark grayish-brown (2.5Y 4/2) and light olive-brown (2.5Y 5/4) silty clay loam; common, fine, distinct brownish-yellow (10YR 6/8) and strong brown (7.5YR 5/8) mottles; few black (5YR 2/1) iron and manganese concretions and stains; thin, continuous grayish-brown (2.5Y 5/2) clay films; moderate, fine to medium, prismatic, breaking to fine to medium, subangular blocky structure; firm; common roots; clear, smooth boundary; pH 5.5.

B3 (41-54") Mixed 50-percent light olive-gray (5Y 6/2) and 50-percent yellowish-brown (10YR 5/6 and 5/8) light silty clay loam; common black (5YR 2/1) iron and manganese stains; thin, discontinuous grayish-brown (2.5Y 5/2) clay films; massive, breaking to weak, coarse, angular blocky structure; friable; common roots; clear, smooth boundary; pH 7.0.

Nearly level, very productive Muscatine soils dominate the central portion of this landscape. (Fig. 20)

C1 (54-74") Mixed 60-percent yellowish-brown (10YR 5/8), 30-percent light brownish-gray (2.5Y 6/2), and 10-percent strong brown (7.5YR 5/6) silt loam; few very dark gray (2.5Y 3/0) root channel fillings; massive; friable; common roots; gradual, smooth boundary; pH 7.5.

C2 (74" +) Mixed gray (7.5YR 6/0), light gray (5Y 6/1), and yellowish-brown (10YR 5/6) silt loam; massive; friable; occasional roots; calcareous, with strong effervescence.

Myrtle Series (414)

The Myrtle series consists of moderately dark-colored, well-drained soils developed on upland ridgetops and slopes with 2- to 12-percent gradients. They have developed under mixed prairie-forest vegetation, partly in loess 30 to 50 inches thick and partly in a reddish well-drained paleosol in glacial drift, which is dominantly till. Weathering and soil development occurred in the glacial deposits prior to loess deposition.

These soils are deep and moderately permeable; they have high to very high available water capacity.

Myrtle soils occur on ridgetops in areas where Argyle (227) and Pecatonica (21) soils occur on side slopes. Where the loess deposits are thicker, Tama (36) and Downs (386) soils often occur on ridgetops, and Myrtle soils occupy the side slopes. These soils are most commonly found in the eastern one-half of Stephenson County.

The four mapping units shown on the soil map are 414B, 414C, 414C2, and 414D2. The eroded units have some mixing of B horizon in the plow layer.

Myrtle silt loam representative profile (414B)

Ap (0-8") Very dark gray (10YR 3/1) silt loam; moderate, fine, granular structure; friable; abrupt, smooth boundary; pH 7.0.

A2 (8-14") Dark grayish-brown (10YR 4/2) silt loam; weak, fine and medium, crumb structure; friable; clear, smooth boundary; pH 6.5.

B1 (14-19") Brown (10YR 4/3) light silty clay loam; patchy silt coats on all ped surfaces, light gray (10YR 7/1) when dry; discontinuous very dark grayish-brown (10YR 3/2) clay-organic coats on all ped surfaces; moderate, very fine, subangular blocky structure; friable; clear, smooth boundary; pH 6.0.

B21t (19-27″) Dark yellowish-brown (10YR 4/4) silty clay loam; discontinuous silt coats on all ped surfaces, light gray (10YR 7/1) when dry; thin, discontinuous dark brown (10YR 3/3) clay coats on all ped surfaces; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

B22t (27-37″) Dark yellowish-brown (10YR 4/4) silty clay loam; discontinuous silt coats on all ped surfaces, light gray (10YR 7/1) when dry; thin, discontinuous very dark grayish-brown and brown (10YR 3/2 and 3/3) clay coats on all ped surfaces; moderate, medium, subangular blocky structure; firm; gradual, smooth boundary; pH 5.8.

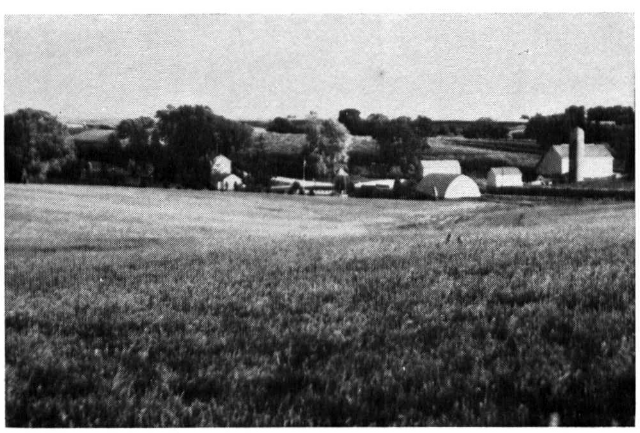
B23t (37-42″) Dark yellowish-brown (10YR 4/4) silty clay loam; patchy silt coats on all ped surfaces, light gray (10YR 7/1) when dry; moderately thick, discontinuous dark brown (7.5YR 3/3) clay coats on all ped surfaces; moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.0; some grit, but horizon is considered primarily a loess horizon.

IIB24t (42-80″ +) Brown (7.5YR 4/4) clay loam; discontinuous reddish-brown (5YR 4/4) and dark reddish-brown (5YR 3/3) clay coats on all ped surfaces; few, fine, black (N 2/0) iron-manganese stains; moderate, medium and coarse, subangular blocky structure; firm; clear, smooth boundary; pH 6.0. Dolomitic limestone bedrock at 88 inches.

Nasset Series (731)

The Nasset series is composed of moderately dark-colored, well-drained soils developed partly in loess about 3 to 5 feet thick and partly in clayey residuum from dolomitic limestone. Developed in transitional prairie-forest areas, they occur in upland areas on slopes ranging from 2 to 12 percent. Nasset soils have developed in parent materials identical to those of the Palsgrove (429) and Ashdale (411) soils but are intermediate between these two in surface color and A1 horizon thickness. Palsgrove soils are lighter colored than Nasset; Ashdale soils have darker colored surface horizons.

Nasset soils are deep and moderately permeable; they have moderate available water capacity.



Nasset soils occupy many of the ridgetops in this area about 2½ miles west of Orangeville. The steeper side slopes have a mixed pattern of loess or till over dolomitic limestone bedrock with the bedrock occurring at less than 5 feet in most of the area. (Fig. 21)

Most commonly associated soils are Tama (36), Downs (386), Oneco (752), Palsgrove (429), and Dubuque (29). Nasset soils occur in widely separated parts of the county; the largest areas occur west of Orangeville.

Four mapping units are shown on the soil map: 731B, 731C, 731C2, and 731D2. The eroded units have lost about one-half of the A horizons.

Nasset silt loam representative profile (731B)

Ap (0-7″) Very dark brown to very dark grayish-brown (10YR 2/2 to 3/2) silt loam; moderate, fine to very fine, platy structure which breaks to medium, crumb structure; friable; abrupt, smooth boundary; common roots; pH 7.3.

A2 (7-11″) Dark grayish-brown (10YR 4/2) silt loam with very numerous silt coatings, light gray (10YR 7/2) when dry; weak, fine, platy structure to moderate, medium to coarse, crumb structure; friable; clear, smooth boundary; common roots; pH 7.3.

B21t (11-24″) Dark brown to brown (10YR 4/3) silty clay loam with common silt coatings, light gray (10YR 7/2) when dry; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; common roots; pH 5.1.

B22t (24-33″) Dark yellowish-brown (10YR 4/4) silty clay loam with common silt coatings, light gray (10YR 7/2) when dry, and discontinuous clay coatings of dark brown (7.5 YR 3/2 and 3/3); moderate, medium, subangular blocky structure; firm; clear, smooth boundary; occasional roots; pH 5.4.

B31t (33-41″) Dark yellowish-brown (10YR 4/4) light silty clay loam with common silt coatings, light gray (10YR 7/2) when dry, and few, patchy clay coatings of dark brown (10YR 3/3); weak to moderate, medium to coarse, angular blocky and subangular blocky structure; firm; abrupt, smooth boundary; occasional roots; pH 5.6.

IIB32 (41-53″) Dark reddish-brown to reddish-brown (5YR 3/4 to 5/4) clay with few, thin streaks of black (5YR 2/1); weak to moderate, medium, angular blocky and subangular blocky structure; firm; abrupt, smooth boundary; occasional roots; pH 6.1; horizon is in limestone residuum.

R (53″ +) Very pale brown (10YR 7/4) to yellow (10YR 7/6 and 7/8) dolomitic limestone with some chert; hard but shattered; calcareous.

Octagon Series (656)

The Octagon series consists of moderately dark-colored, well-drained soils developed partly in loess (maximum thickness of 18 inches) and partly in loam-textured glacial till. Solum thickness normally is between 2 and 3½ feet. Developed under mixed prairie-forest vegetation, these soils occur on upland slopes of 4 to 12 percent.

Octagon soils are deep; they have moderate permeability and high available water capacity.

These soils are similar to Miami (27) soils, with which they occur; however, Octagon soils have darker colored, thicker surface horizons. They are also associated with Pecatonica (21), Argyle (227), and Myrtle (414) soils. They occur in a scattered pattern in the county, mainly east of Freeport, north of the Pecatonica River.

The two mapping units shown on the soil map are 656C2 and 656D2. Included with the Octagon soils are a few areas that are moderately well drained and small areas where the till texture is sandy loam. The profile described represents maximum thickness of A horizons for the mapping unit.

Octagon silt loam representative profile (656C2)

A1 (0-8″) Very dark brown and very dark grayish-brown (10YR 2/2 and 3/2) silt loam; moderate, fine, granular structure; friable; clear, smooth boundary; pH 6.0.

A2 (8-11″) Dark grayish-brown and brown (10YR 4/2 and 4/3) silt loam with some channel fillings of very dark grayish brown (10YR 3/2); moderate, fine and medium, granular structure; friable; clear, smooth boundary; pH 6.0.

IIB1 (11-15″) Dark yellowish-brown (10YR 4/4) silty clay loam; silt coatings of light brownish gray (10YR 6/2) when dry; discontinuous very dark grayish-brown (10YR 3/2) clay coatings; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 6.6; noticeable sand and a little gravel.

IIB21t (15-22″) Dark yellowish-brown (10YR 4/4) silty clay loam to clay loam with discontinuous dark brown to brown (7.5YR 4/3) clay coatings; moderate, fine to medium, subangular blocky structure; firm; clear, smooth boundary; pH 7.5; occasional gravel.

IIB22t (22-28″) Dark yellowish-brown and yellowish-brown (10YR 4/4 and 5/6) clay loam with discontinuous dark brown to brown (7.5YR 4/3) clay coatings; weak, medium, angular blocky structure; firm; clear, smooth boundary; pH 7.5; occasional gravel.

IIB3t (28-32″) Yellowish-brown (10YR 5/4 and 5/6) clay loam with patchy clay coats of dark brown to brown (7.5 YR 4/3); weak, coarse, angular blocky structure; firm; clear, smooth boundary; pH 7.8, with calcareous spots; occasional gravel.

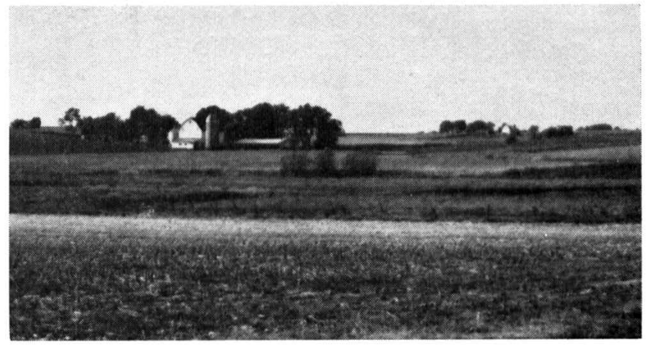
IIC (32-60″ +) Yellowish-brown, light yellowish-brown, and brownish-yellow (10YR 5/4, 6/4, and 6/6) medium to light loam glacial till; massive to weak, medium to coarse, angular blocky structure; friable; moderately to strongly calcareous.

Ogle Series (412)

The Ogle series consists of dark-colored, well-drained soils developed partly in 30 to 50 inches of loess and partly in a well-drained reddish paleosol formed in glacial drift that is dominantly till. Weathering and soil development progressed in the glacial deposits prior to loess deposition. The amount of solum development that has occurred since loess deposition is difficult to determine. These soils developed under prairie vegetation on upland slopes ranging from 2 to 12 percent. Ogle soils are developed in parent materials similar to those of Flagg (419) and Myrtle soils (414), but Ogle soils have darker surface horizons and lack an A2 horizon.

Ogle soils are deep and moderately permeable; they have a high to very high available water capacity.

In thicker loess areas, Ogle soils occupy side slopes, and Tama soils (36) occur on ridgetops. In areas of thinner loess, Ogle soils may occur primarily on ridgetops; major associated soils on side slopes are Durand (416), Griswold (363), and Hitt (506). Ogle soils are found most commonly in the eastern one-half of the county.



Typical landscape of thin loess over till parent materials. Ogle and Myrtle soils occupy the ridgetops, Durand and Argyle soils occur on the steeper side slopes. Alluvial soils are in the foreground. (Fig. 22)

The four mapping units shown on the soil map are 412B, 412C, 412C2, and 412D2. The eroded units have a portion of the B horizon mixed with the plow layer.

Ogle silt loam representative profile (412B)

A1 (0-8″) Very dark gray (10YR 3/1) silt loam; moderate, fine and medium, crumb structure; friable; clear, smooth boundary; pH 7.0.

A3 (8-13″) Very dark grayish-brown (10YR 3/2) light silty clay loam; weak, fine and medium, crumb structure; friable; clear, smooth boundary; pH 6.8.

B21t (13-19″) Brown to dark brown (10YR 4/3) silty clay loam; thin, continuous dark brown (10YR 3/3) and very dark grayish-brown (10YR 3/2) clay coats on all ped surfaces; weak, fine and medium, subangular blocky structure; friable; clear, smooth boundary; pH 6.3.

B22t (19-28″) Dark yellowish-brown (10YR 4/4) silty clay loam; thin, continuous brown to dark brown (10YR 4/3) clay coats and discontinuous silt coats, light gray (10YR 7/1) when dry, on all ped surfaces; compound weak, medium, prismatic and medium and coarse, subangular blocky structure; friable to firm; clear, smooth boundary; pH 6.0.

B23t (28-38″) Dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4) silty clay loam; thin, discontinuous dark brown to brown (10YR 4/3) clay coats on ped surfaces; discontinuous silt coats on ped surfaces, light gray (10YR 7/1) when dry; compound moderate, medium, prismatic and medium and coarse, subangular blocky and angular blocky structure; friable to firm; abrupt, wavy boundary; pH 6.0.

IIB24t (38-98″) Yellowish-red (5YR 5/6 and 4/6) heavy clay loam; moderately thick, discontinuous reddish-brown (5YR 4/3) and dark reddish-brown (5YR 3/3 and 3/2) clay coats on all ped surfaces; numerous specks of dark reddish brown; black (10YR 2/1) root channel fillings; moderate, coarse, prismatic structure (structure observed only in 38- to 50-inch depth); firm to very firm; pH 6.3; calcareous sandy loam till occurs at 98 inches.

Oneco Series (752)

The Oneco series is made up of moderately dark-colored, well-drained soils developed in transitional prairie-forest areas on upland slopes of 4- to 12-percent gradient. These soils have developed partly in loess and partly in glacial drift, usually till; the lower part of the solum is in residuum from limestone. The solum is usually between 3 and 5 feet thick and rests directly on limestone bedrock at depths below 40 inches.

Oneco soils are deep; they have moderate permeability and moderate available water capacity.

These soils occur throughout the county where thin loess and till deposits overlie limestone. They are associated with Hitt (506) and Woodbine (410) soils and are intermediate between the two in many characteristics. Hitt soils, having developed under grass, are darker colored; Woodbine soils, having developed under forest, are lighter colored. Other associated soils are Argyle (227), Myrtle (414), and Nasset (731).

Included with Oneco on the soil map are areas where the residuum from limestone is not present. A few areas are included that do not have a loess mantle. Three mapping units are shown on the soil map: 752C, 752C2, and 752D2. The eroded units have some mixing of B horizons in the plow layer.

Oneco silt loam representative profile (752C)

Ap (0-7") Very dark brown (10YR 2/2) silt loam; moderate, fine and medium, granular structure; friable; abrupt, smooth boundary; pH 7.3.

B1 (7-14") Brown (10YR 4/3) light silty clay loam; moderate, fine, subangular blocky structure; friable; few, thin, very dark brown (10YR 2/2) organic coats; clear, smooth boundary; pH 6.2.

IIB21t (14-19") Brown (7.5YR 4/4) clay loam; moderate, fine and medium, subangular blocky structure; firm; moderately thick, continuous dark reddish-brown (5YR 3/4) clay films; clear, smooth boundary; pH 5.8.

IIB22t (19-29") Reddish-brown (5YR 4/4) clay loam; moderate, medium and coarse, subangular blocky structure; firm; thin, continuous reddish-brown (5YR 4/3) clay films; clear, smooth boundary; pH 5.8.

IIB23t (29-37") Reddish-brown (5YR 4/4) clay loam; weak, medium and coarse, subangular and angular blocky structure; firm; thin, discontinuous dark reddish-brown (5YR 3/3) clay films; clear, smooth boundary; pH 6.0; some fine gravel.

IIIB3t (37-41") Reddish-brown (5YR 4/4) silty clay to clay; weak, coarse, angular blocky structure; very firm; thin, discontinuous dark reddish-brown (5YR 3/4) clay films; abrupt, smooth boundary; pH 6.5.

R (41-60" +) Yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), and yellow (10YR 7/6) dolomitic limestone rock; partially disintegrated; calcareous.

Orion Series (415)

The Orion series occurs in bottoms or flood plains of major streams and their tributaries where stratified, light-colored sediments of silt loam from forested uplands have accumulated. These are somewhat poorly drained soils that have a dark buried soil of silt loam to light silty clay loam occurring at depths of 18 to 40 inches.

Orion soils are deep and moderately permeable; they have very high available water capacity.

They are most commonly associated with Lawson (451), Otter (76), and Radford (74) soils. Orion soils are similar to Lawson soils but have lighter colored surface horizons.

Only one mapping unit, 415, is shown on the soil map.

Orion silt loam representative profile (415)

A11 (0-8") Dark grayish-brown (10YR 4/2) silt loam with occasional spots of very dark gray (10YR 3/1); weak, very fine, platy to moderate, fine, granular structure; friable; abrupt, smooth boundary; pH 7.0.

A12 (8-14") Dark grayish-brown (10YR 4/2) silt loam with occasional spots of very dark gray (10YR 3/1); common, fine, faint dark yellowish-brown (10YR 4/4) and yellowish-brown (10YR 5/6) mottles; moderate to strong, medium to fine, platy structure; friable; clear, smooth boundary; pH 6.3.

A13 (14-34") Stratified very dark brown, dark grayish-brown, and grayish-brown (10YR 2/2, 4/2, and 5/2), and two 1-inch bands of brown (10YR 5/3) silt loam, all with common, fine, distinct brown and strong brown (7.5YR 4/4 and 5/6) mottles; weak, fine, platy and weak, fine, granular structure; friable; abrupt, smooth boundary; pH 6.5 throughout horizon.

A11b (34-39") Black (10YR 2/1) silt loam with small spots of dark grayish brown and dark brown (10YR 4/2 and 4/3); massive to very weak, fine, granular structure; friable; abrupt, smooth boundary; pH 7.0.

A12b (39" +) Black (10YR 1/1) light silty clay loam with small areas of dark grayish brown and dark brown (10YR 4/2 and 4/3); moderate, fine, subangular blocky structure in upper few inches, grading to weak, fine, prismatic, which breaks to fine, angular blocky structure; firm; pH 7.0.

Otter Series (76)

The Otter series consists of dark-colored, poorly drained soils developed in silty sediments deposited on the flood plains of the major streams and their tributaries. These soils occur in level areas in the wetter portions of drainageways and occasionally in depressed areas of flood plains.

Otter soils are deep; they have moderate permeability and very high available water capacity.

Major associated soils are Lawson (451), Radford (74), and Millington (82).

Two mapping units are shown on the soil map, 76 and W76. The W76 unit is very wet and has a continually high water table.

Otter silt loam representative profile (76)

A11 (0-10") Black (10YR 2/1) silt loam; strong, medium and coarse, crumb structure; friable; abundant roots; clear, smooth boundary; pH 7.0.

A12 (10-30") Black (N 2/0) silt loam; massive; very high organic-matter content; abrupt, smooth boundary; pH 7.5.

Cg (30-60" +) Greenish-gray (5G 5/1) silt loam; massive; few roots, which have undergone decomposition toward peat-like material; pH 7.5.

Palsgrove Series (429)

The Palsgrove series is composed of light-colored, well-drained soils developed under forest in the uplands on slopes ranging from 2 to 18 percent. These soils are developed partly in loess about 3 to 5 feet thick and partly in residuum from limestone.

Palsgrove soils are deep; they have moderate permeability and moderate available water capacity.

These soils occur in various parts of the county: they are dominant soils in the Waddams Creek area, in sloping areas adjacent to the Pecatonica River south of Winslow, and in parts of Jefferson Township in the southwestern corner of the county. Although they are associated with and similar to Nasset (731) and Ashdale (411) soils, Palsgrove soils have lighter colored and thinner surface horizons. In areas with a thick loess mantle, Fayette (280), Rozetta (279), and Downs (386) soils often occur on ridgetops, and Palsgrove soils occupy the side slopes. In areas of thinner loess, Palsgrove soils may occur on ridgetops, and Dubuque (29) and Sogn (504) soils may be on the more sloping topography.

Included with Palsgrove soils are minor areas where the limestone residuum is absent and a few areas where thin layers of till occur between the loess and bedrock. The five mapping units shown on the soil map are 429B, 429C, 429C2, 429D, and 429D2. The 429D2 mapping unit indicates slopes ranging from 7 to 18 percent, which is a departure from the normal 7- to 12-percent range of the D symbol. Some of the B horizon is mixed with the plow layer in the eroded units.

Palsgrove silt loam representative profile (429C)

A1 (0-4″) Very dark grayish-brown (10YR 3/2) silt loam; moderate, fine and very fine, crumb structure; friable; abundant roots; pH 7.0; abrupt, smooth boundary.

A2 (4-8″) Brown (10YR 5/3) silt loam; moderate, thin, platy structure; friable; abundant roots; pH 6.5; clear, smooth boundary.

B1 (8-11″) Dark brown (10YR 4/3) silt loam; moderate, very fine and fine, subangular blocky structure with common light gray (10YR 7/1) silt coatings when dry; friable; abundant roots; pH 6.5; clear, smooth boundary.

B21t (11-17″) Dark brown (10YR 4/3) silty clay loam; moderate, very fine and fine, subangular blocky structure with few light gray (10YR 7/1) silt coatings when dry; firm; abundant roots; pH 6.0; clear, smooth boundary.

B22t (17-23″) Dark brown (10YR 4/3) silty clay loam; moderate, fine, subangular blocky structure with thin, discontinuous dark brown (7.5YR 3/4) clay coatings and few light gray (10YR 7/1) silt coatings when dry; firm; common roots; pH 6.0; clear, smooth boundary.

B23t (23-30″) Dark brown (10YR 4/3) silty clay loam; moderate, fine, angular and subangular blocky structure with thin, discontinuous dark brown (7.5YR 3/2) clay coatings and few light gray (10YR 7/1) silt coatings when dry; firm; common roots; pH 5.5; clear, smooth boundary.

B24t (30-37″) Dark brown (10YR 4/3) and dark yellowish-brown (10YR 4/4) silty clay loam; moderate, fine and medium, angular blocky structure with thin, discontinuous dark brown (7.5YR 3/2) clay coatings; firm; common roots; pH 5.5; clear, wavy boundary.

IIB3 (37-42″) Reddish-brown (5YR 4/4) and dark reddish-brown (5YR 3/3) clay; moderate, fine and medium, angular and subangular blocky structure with few dark brown (7.5YR 3/2) and black (10YR 2/1) coatings; very firm; occasional roots; pH 6.2; clear, wavy boundary.

R (42″+) Very pale brown (10YR 7/4) and yellow (10YR 7/8) dolomitic limestone with the upper 3 to 5 inches partially disintegrated; calcareous.

Parr Series (221)

The Parr series consists of dark-colored, well-drained soils developed partly in loess less than 18 inches thick and partly in loam-textured glacial till. Solum thickness is normally between 2 and 3½ feet. Development occurred under grass vegetation on nearly level to strongly sloping (2 to 12 percent) upland areas.

Parr soils are deep; they have moderate permeability and high available water capacity.

These soils have a scattered distribution pattern but occur most frequently in the eastern portion of the county in the areas where the glacial till deposits are several feet thick. Parr soils are associated with and have parent materials similar to those of Octagon (656) and Miami (27) soils. Parr soils have thicker, darker colored surface horizons than either of the other two and do not have A2 horizons. Parr soils also occur with Ogle (412), Durand (416), and Catlin (171) soils.

Four mapping units are shown on the soil map: 221B, 221C, 221C2, and 221D2. Some areas with a slightly thicker loess mantle and with sandy loam rather than loam till are included with Parr on the soil map.

Parr silt loam representative profile (221B)

A1 (0-9″) Black (10YR 2/1) to very dark brown (10 YR 2/2) silt loam; compound weak, medium and coarse, subangular blocky and very fine and fine, granular structure; friable; clear, smooth boundary; pH 6.5.

IIA3 (9-14″) Very dark brown (10YR 2/2) and very dark grayish-brown (10YR 3/2) heavy loam; compound weak, medium and coarse, subangular blocky and very fine and fine, granular structure; friable; clear, smooth boundary; pH 6.0.

IIB1t (14-19″) Dark brown (10YR 3/3) clay loam; discontinuous very dark grayish-brown (10YR 3/2) organic coatings on all ped surfaces; weak, medium, subangular blocky structure; friable; clear, smooth boundary; pH 6.0.

IIB21t (19-25″) Dark brown (10YR 3/3 to 4/3) clay loam; patchy very dark grayish-brown (10YR 3/2) clay coats on vertical ped surfaces; very dark brown (10YR 2/2) root channel fillings; weak, coarse, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

IIB22t (25-32″) Brown to dark brown (10YR 4/3) and dark yellowish-brown (10YR 4/4) clay loam; patchy very dark grayish-brown (10YR 3/2) clay coats on vertical ped surfaces; compound moderate, medium, prismatic and coarse, subangular blocky structure; firm; clear, smooth boundary; pH 6.2.

IIB3t (32-36") Brown to dark brown (7.5YR 4/4) clay loam; discontinuous dark brown (7.5YR 3/2) clay coats on all ped surfaces; compound moderate, medium, prismatic and coarse, subangular blocky structure; firm; abrupt, wavy boundary; pH 6.7.

IIC (36-60" +) Yellowish-brown (10YR 5/4) silt loam to loam glacial till; massive; calcareous; strongly effervescent.

Pecatonica Series (21)

The Pecatonica series consists of light-colored, well- and moderately well-drained soils developed partly in loess 15 to 30 inches thick and partly in glacial till (including some water-deposited materials) of loam to sandy-loam texture. Weathering and soil development took place in the till prior to loess deposition; the solum is at least 4 feet thick and may be as thick as 6 or 7 feet. These soils developed under forest vegetation on upland slopes ranging from 2 to 12 percent in gradient.

Pecatonica soils are deep and are moderately permeable. They have high available water capacity.

Associated soils include Argyle (227) and Durand (416), which are developed from similar parent materials. Pecatonica soils have lighter colored surface horizons than these soils. Other soils occurring with Pecatonica are Myrtle (414), Flagg (419), Miami (27), Kidder (361), and Westville (22).

Mapping units shown on the soil map are 21B, 21C, 21C2, and 21D2. The eroded units have B horizon material as part of the plow layer.

Pecatonica silt loam representative profile (21B)

A1 (0-3") Very dark gray (10YR 3/1) silt loam; moderate, fine, crumb structure; friable; clear, smooth boundary; pH 7.3.

A21 (3-7") Dark grayish-brown (10YR 4/3 when moist, 10YR 6/2 when dry) silt loam; few very dark gray (10YR 3/1) wormcasts; strong, thin, platy structure; friable; gradual, smooth boundary; pH 6.5.

A22 (7-10") Dark yellowish-brown (10YR 4/4) silt loam; strong, thin, platy structure; friable; clear, smooth boundary; pH 5.5.

B1 (10-16") Brown (7.5YR 4/4) light silty clay loam; thin, almost continuous dark brown (7.5YR 3/4) clay coatings; weak, fine, subangular blocky structure; slightly firm; pH 5.5; clear, smooth boundary.

B21t (16-20") Brown (7.5YR 4/4) gritty silty clay loam; thin, continuous dark reddish-brown (5YR 3/4) clay coatings; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; pH 5.5.

IIB22t (20-37") Reddish-brown (5YR 4/4) clay loam; thin, continuous dark reddish-brown (5YR 3/4) clay coatings; few oxide specks of very dark gray (10YR 3/1); moderate, medium, subangular blocky structure; firm; clear, wavy boundary; pH 5.2.

IIB23t (37-48") Reddish-brown (5YR 4/4) light clay loam; few, patchy dark reddish-brown (5YR 3/4) clay coatings; moderate, coarse to medium, subangular blocky structure; slightly firm; gradual, wavy boundary; pH 5.2; a few disintegrated granite pebbles.

IIB31t (48-56") Reddish-brown (5YR 4/4) light clay loam; few, patchy dark reddish-brown (5YR 3/2) clay coatings; few oxide specks of very dark gray (10YR 3/1); weak, coarse, subangular blocky structure; clear, wavy boundary; pH 5.5.

IIB32 (56-65") Brown (7.5YR 4/4) heavy loam; few, fine, very dark gray (10YR 3/1) root channel fillings; common, medium, distinct yellowish-brown (10YR 5/8) mottles; clear, wavy boundary; pH 5.2.

IIC (65" +) Calcareous, loam-textured glacial till.

Plano Series (199)

The Plano series is made up of dark-colored, well- and moderately well-drained soils developed under grass vegetation partly in loess or silty material about 3 to 5 feet thick and partly in stratified, medium-textured, water-laid sediments.

Plano soils are deep and moderately permeable. They have high to very high available water capacity.

These soils occur on nearly level to moderately sloping (0 to 7 percent) topography, primarily on benches and stream terraces but also in loess-covered outwash areas in the upland. They occur extensively in Florence and Silver Creek Townships. Developed in the same parent materials as Batavia (105) and St. Charles (243) soils, Plano soils differ from them in having thicker and darker A horizons. Also associated with Plano are Tama (36), Proctor (148), and Elburn (198) soils.

The four mapping units shown on the soil map are 199A, 199B, 199C, and 199C2. The eroded unit, 199C2, has lost about one-half of the A horizon.

Plano silt loam representative profile (199B)

A1 (0-9") Very dark brown (10YR 2/2) silt loam; moderate, very fine and fine, crumb structure; friable; moderately thick, continuous very dark gray (10YR 3/1) organic coats on all ped surfaces; abrupt, smooth boundary; pH 7.3.

A3 (9-19") Dark brown (10YR 3/3) silt loam; moderate, medium, subangular blocky structure; friable; moderately thick, continuous very dark grayish-brown (10YR 3/2) organic coats on all ped surfaces; light gray (10YR 7/1) silt coats, not evident when wet; clear, smooth boundary; pH 6.5.

B21t (19-35") Dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, medium, subangular blocky structure; friable; thin, continuous dark grayish-brown (10YR 4/2) clay coats on all ped surfaces; light gray (10YR 7/1) silt coats, not evident when wet; abrupt, smooth boundary; pH 6.3.

B22t (35-50") Yellowish-brown (10YR 5/4) silty clay loam; strong, coarse, angular blocky structure; firm; common, fine, distinct brown to dark brown (7.5YR 4/4) mottles; continuous dark grayish-brown (10YR 4/2) clay coats on all ped surfaces; light gray (10YR 7/1) silt coats, not evident when wet; iron-manganese concretions present; abrupt, wavy boundary; pH 5.8.

IIB3t (50-65") Yellowish-brown (10YR 5/4) clay loam; weak to moderate, coarse, angular blocky structure; firm; clear, smooth boundary; pH 6.0.

IIC (65" +) Yellowish-brown and dark yellowish-brown (10YR 5/4 and 3/4) stratified loam, sandy loam, and sandy clay loam; massive; friable; pH 7.0; calcareous sandy loam at 100 inches.

Proctor Series (148)

The Proctor series consists of dark-colored, moderately well-drained and well-drained soils developed partly in loess or silty material less than 40 inches thick and partly in stratified, medium-textured, water-laid sediments. They developed under prairie vegetation on stream terraces. Proctor soils also occur in upland outwash areas that have a thin loess mantle. These soils occur on slopes ranging from 0 to 12 percent.

Proctor soils are deep and moderately permeable. They have high available water capacity.

They are associated with Tama (36), Plano (199), Harvard (344), and Camden (134) soils. They have darker colored and thicker surface horizons than Harvard and Camden soils.

Five mapping units are shown on the soil map: 148A, 148B, 148C, 148C2, and 148D2. The eroded units have lost enough of the A horizons so that part of the B horizon is mixed into the plow layer.

Proctor silt loam representative profile (148A)

Ap (0-8″) Very dark brown (10YR 2/2) silt loam; weak, medium, subangular blocky structure; friable; abundant roots; abrupt, smooth boundary; pH 6.0.

A12 (8-14″) Mixed 75-percent very dark brown (10YR 2/2) and 25-percent very dark grayish-brown (10YR 3/2) silt loam; moderate, fine and medium, subangular blocky structure; friable; abundant roots; clear, smooth boundary; pH 5.6.

B1 (14-19″) Dark brown (10YR 3/3) light silty clay loam; moderate, fine, subangular blocky structure; friable; common roots; many black (10YR 2/1) wormcasts and channel fillings; clear, smooth boundary; pH 5.6.

B21t (19-25″) Brown (10YR 4/3) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; few black (10YR 2/1) wormcasts; common roots; clear, smooth boundary; pH 6.0.

IIB22t (25-32″) Brown (10YR 4/3) clay loam; moderate, medium and coarse, subangular and angular blocky structure; friable; few black (10YR 2/1) wormcasts and channel fillings; common, fine, faint dark yellowish-brown (10YR 4/4) mottles; common roots; clear, smooth boundary; pH 6.5.

IIB3t (32-42″) Mixed dark grayish-brown (10YR 4/2) and dark brown (10YR 3/3) light clay loam; weak, moderate and coarse, subangular blocky structure; friable; many, fine, faint dark yellowish-brown (10YR 4/4) mottles; few black (10YR 2/1) wormcasts and channel fillings; occasional roots; gradual, smooth boundary; pH 6.5.

IIC (42-60″ +) Dark grayish-brown (10YR 4/2) stratified silt loam, loam, and light silty clay loam; massive; friable; pH 6.5.

Radford Series (74)

The Radford series is composed of somewhat poorly drained bottomland soils formed in dark-colored silty sediments washed in from upland areas and deposited over a black silty clay loam that was the former soil surface. The recent silty deposits average 1 to 3 feet in thickness.

Radford soils are deep. They have moderate permeability and very high available water capacity.

These soils occur regularly with Sawmill (107) and Lawson (451) soils. Sawmill soils have silty clay loam surfaces, and Lawson soils have silt loam to depths greater than 3 feet. Radford soils are very extensive and occur in the level flood plains of major and tributary streams throughout the county. Included are many areas considered poorly drained and a few areas in which the surface horizons are lighter in color than is normal for this soil series.

Two mapping units are shown on the soil map: 74 and W74. The W74 unit has a high water table during most seasons and is wetter than the 74 unit.

Radford silt loam representative profile (74)

A11 (0-6″) Black to very dark brown (10YR 2/1 to 2/2) silt loam; moderate, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 7.0.

A12 (6-14″) Black to very dark gray (10YR 2/1 to 3/1) silt loam; silt coats on ped surfaces; moderate, thin and medium, platy structure; friable; abrupt, smooth boundary; pH 7.0.

A13 (14-29″) Very dark gray (10YR 3/1) silt loam with few, thin, dark grayish-brown (10YR 4/2) bands; silt coats on ped surfaces; moderate, thin, platy structure; friable; abrupt, smooth boundary; pH 7.3.

A11b (29-35″) Black (10YR 2/1) light silty clay loam with few, fine, prominent dark reddish-brown (5YR 3/3) mottles; weak, medium, subangular blocky and fine and medium, granular structure; friable; clear, smooth boundary; pH 7.5.

A12b (35-43″) Black (10YR 2/1) silty clay loam with common, fine and medium, prominent dark reddish-brown (5 YR 3/4) mottles; weak, coarse, subangular blocky and fine to coarse, granular structure; friable; clear, smooth boundary; pH 7.5.

B1b (43-60″) Black (10YR 2/1) silty clay loam with common, fine and medium, prominent dark reddish-brown (5 YR 3/4) mottles; moderate, medium, subangular blocky and angular blocky structure; clear, smooth boundary; pH 7.7.

C (60-100″ +) Dark gray (5Y 4/1) to very dark gray (5Y 3/1) stratified silt loam, loam, and silty clay loam. Observed by screw auger boring only.

Ridott Series (743)

The Ridott series consists of moderately dark-colored, somewhat poorly drained soils developed in transitional prairie-forest areas on gently to moderately sloping (2 to 7 percent) topography. They have developed partly in loess 30 to 50 inches thick and partly in underlying shale bedrock. They occur on the shale uplands, especially in the areas west and south of Pearl City and south of Eleroy.

Ridott soils have moderate permeability in the upper solum and slow permeability in the shale. Available water capacity varies from moderate to high.

Common associates are Eleroy (547), Massbach (753), Derinda (417), and Loran (572) soils. Ridott soils are developed in the same parent material and have the same natural drainage as Loran soils but have A2 horizons and lighter colored surface horizons. Some poorly drained areas are included with Ridott on the soil maps.

Two mapping units, 743B and 743C, are shown on the soil map.

Ridott silt loam representative profile (743B)

A11 (0-5″) Very dark grayish-brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) when dry; few reddish-brown and yellowish-red (5YR 4/4 and 4/6) specks; moderate, fine, crumb structure; friable; pH 6.3; clear, smooth boundary.

A12 (5-8″) Very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) when dry; few reddish-brown (5YR 4/3) specks; moderate, thin, platy, breaking to moderate, fine, crumb structure; friable; pH 6.3; abrupt, smooth boundary.

A2 (8-11″) Dark grayish-brown (2.5Y 4/2) and grayish-brown (2.5Y 5/2) silt loam with few, fine, prominent yellowish-brown (10YR 5/4) mottles; moderate, thin, platy, breaking to moderate, fine, crumb structure; friable; very dark gray (10YR 3/1) fillings in root channels; pH 6.0; clear, smooth boundary.

B1 (11-15″) Grayish-brown (2.5Y 5/2) light silty clay loam with few, prominent yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; thin, continuous dark gray (10YR 4/1) clay films; friable; pH 6.0; clear, smooth boundary.

B21tg (15-24″) Gray (5Y 5/1) silty clay loam with common, fine, prominent yellowish-brown (10YR 5/6) mottles; strong, fine, subangular blocky structure; moderately thick, continuous dark gray (10YR 4/1) clay films; firm; pH 6.0; clear, smooth boundary.

B22tg (24-33″) Gray (5Y 5/1) silty clay loam with many, medium, prominent yellowish-brown (10YR 5/6) mottles; moderate to strong, fine and medium, subangular blocky structure; thin, continuous dark gray (10YR 4/1) clay films; firm; common black (N 2/0) iron-manganese concretions; pH 6.0; clear, smooth boundary.

B23tg (33-38″) Dark gray (5Y 4/1) silty clay loam with many, medium, prominent yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; thin, discontinuous dark gray to gray (10YR 4/1 to 5/1) clay films; firm; common black (N 2/0) iron-manganese concretions; pH 6.6; clear, smooth boundary.

IIB3tg (38-44″) Grayish-brown (2.5Y 5/2) silty clay with common, medium, prominent yellowish-brown (10YR 5/6) mottles; weak, medium, subangular and angular blocky structure; patchy dark gray to gray (N 6/0 to N 5/0) clay films; firm; many black (N 2/0) iron-manganese concretions; slick or soapy feel as in shale residuum; pH 8.0; clear, smooth boundary.

IIC (44-72″ +) Mixed light olive-brown (2.5Y 5/4) and greenish-gray (5G 6/1) silty clay to clay shale with streaks and spots of white (10YR 8/1) lime concretions; massive; extremely firm; calcareous; effervesces.

Rodman-Casco Complex (969)

This complex of Rodman and Casco soils occurs on strongly sloping to steep topography on isolated gravelly kames and ice-crevasse fillings in a scattered pattern in the county. This complex does not occur extensively.

Ridge on horizon is typical of many areas of mixed gravel and sand that had occupied channels in glacial ice and were dumped when the glaciers melted. An active gravel pit is on the right end of the ridge, which is mainly Rodman-Casco complex. (Fig. 23)

The Casco series is described with the Casco-Fox complex (972) on page 26. Casco soils have a well-developed B horizon, and calcareous gravel occurs at less than 2 feet. Rodman soils are dark to moderately dark and have developed under prairie or mixed prairie-forest vegetation from a few inches of loamy material over calcareous gravel and coarse sand. The Rodman portion of the complex usually has the darkest surface colors. Within this complex, the Rodman soils tend to occur in the more strongly sloping portions of the mapping units.

Rodman soils are excessively drained and have very rapid permeability. These soils have very low available water capacity.

Fox, Camden (134), and Warsaw (290) are soils often associated with this complex. Although most areas mapped as this complex were developed under forest or mixed prairie-forest, a few areas are included that were developed under prairie vegetation only; these areas are darker colored than the representative Casco description on page 26. Some areas also contain much brown chert and less limestone-derived gravel than is normal for these soils.

Two mapping units are shown on the soil map: 969D2 and 969E2. The 969E2 mapping unit occurs on slopes ranging from 12 to 30 percent. These areas have naturally thin surface horizons or have lost some of the A horizons by erosion.

Rodman gravelly loam representative profile (part of 969D2)

A1 (0-7″) Very dark grayish-brown (10YR 3/2) gravelly loam; weak, fine, granular structure; friable; abrupt, smooth boundary; calcareous, with slight effervescence.

IIC (7-60″ +) Brown, dark yellowish-brown, yellowish-brown, and brownish-yellow (10YR 4/3, 4/4, 5/6, and 6/6) gravel and sand; single grained; loose; calcareous, with strong effervescence. Gravel and sand appear to be mainly locally derived dolomite, but some chert and igneous material are present.

Rozetta Series (279)

The Rozetta series is made up of light-colored, moderately well-drained soils developed entirely in loess under forest vegetation. They occur mainly in the uplands but occasionally on stream terraces on nearly level to gently sloping topography.

Rozetta soils are deep. They have moderate permeability and high to very high available water capacity.

They occur primarily with Fayette (280) and Stronghurst (278) soils in the west-central part of the county. Stronghurst soils are more mottled and have grayer colors in the solum. Fayette soils have better natural drainage and less mottling in the B horizon than Rozetta soils. Other commonly associated soils are Atterberry (61) and Downs (386).

Only two mapping units are shown on the soil map: 279A and 279B.

Rozetta silt loam representative profile (279A)

A1 (0-4″) Very dark gray (10YR 3/1) silt loam; weak, medium, granular structure; friable; abundant roots; pH 5.7; clear, wavy boundary.

A2 (4-11″) Dark grayish-brown (10YR 4/2) silt loam; weak, medium, platy structure; friable; abundant roots; pH 5.3; clear, smooth boundary.

B1 (11-14″) Brown (10YR 4/3) light silty clay loam; weak, medium, subangular blocky structure; firm; thin, brown (10YR 5/3) coatings; abundant roots; pH 5.5; clear, smooth boundary.

B21t (14-21″) Dark yellowish-brown (10YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; firm; moderately thick, continuous brown (10YR 5/3) clay films; abundant roots; pH 5.5; clear, smooth boundary.

B22t (21-39″) Brown (10YR 5/3) silty clay loam; common, medium, distinct light yellowish-brown (10YR 6/4) and common, medium, faint brown (10YR 4/3) mottles; moderate to strong, medium and coarse, subangular blocky structure; firm; thin, continuous dark yellowish-brown (10YR 4/4) clay films; pale brown (10YR 6/3) silica coatings; plentiful roots; pH 5.5; clear, smooth boundary.

B3 (39-50″) Yellowish-brown (10YR 5/4) light silty clay loam; common, medium, distinct pale brown (10YR 6/3) and grayish-brown (10YR 5/2) mottles; weak, coarse, blocky structure; firm; thin, discontinuous brown (10YR 4/3) clay films; plentiful roots; pH 6.0; clear, smooth boundary.

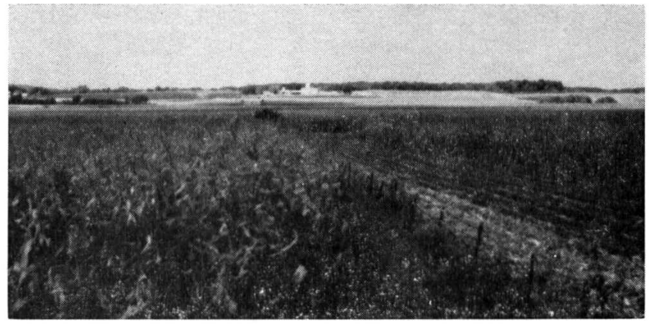
C1 (50-80″) Yellowish-brown (10YR 5/4) silt loam; common, medium, distinct dark grayish-brown (10YR 4/2) mottles; massive; friable; pH 6.0 in upper part, grading to 7.2 in lower part; diffuse, smooth boundary.

C2 (80-85″) Same as C1, but calcareous.

Sable Series (68)

The Sable series consists of very dark-colored, poorly drained soils developed under water-loving grasses on level to nearly level topography. They occur in the loess-covered upland areas of the county and are developed entirely in loess.

Sable soils are deep and are moderately permeable. They have very high available water capacity.



The large, nearly level area in the foreground is occupied mostly by Sable soils; it is located just southeast of the junction of Lost Creek and Yellow Creek. (Fig. 24)

They are most extensive in the prairie areas north and west of Waddams Grove and in parts of Loran and Florence Townships. They are associated with Muscatine (41) and Tama (36) soils. Sable soils have darker, finer textured A horizons and poorer natural drainage than the associated soils. When properly drained, Sable soils are among the most productive soils in the county.

Only one mapping unit, 68, is shown on the soil map.

Sable silty clay loam representative profile (68)

Ap (0-7″) Black (N 2/0) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; abrupt, smooth boundary; pH 7.3.

A12 (7-15″) Black (N 2/0) silty clay loam; moderate, fine and medium, granular structure; friable; clear, smooth boundary; pH 7.5.

B1g (15-20″) Gray (5Y 5/1) to dark gray (5Y 4/1) silty clay loam; common, fine, distinct strong brown (7.5YR 5/8) mottles; few, fine, black (10YR 2/1) iron-manganese concretions; black (N 2/0) root channel fillings and krotovina; moderate, fine and medium, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

B21g (20-26″) Gray (5Y 5/1) to olive-gray (5Y 5/2) silty clay loam with occasional patches of dark gray (5Y 4/1); common, fine, prominent reddish-brown (5YR 4/4) and yellowish-red (5YR 5/8) mottles; numerous black (N 2/0) iron-manganese concretions; compound moderate, medium, prismatic and medium, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

B22g (26-37″) Olive-gray (5Y 5/2) silty clay loam with occasional patches of dark gray (5Y 4/1); common, fine to medium, prominent yellowish-red (5YR 4/6 and 5/8) mottles, which become more concentrated in lower part of horizon; common black (N 2/0) iron-manganese concretions; compound strong, medium, prismatic and medium and coarse, subangular blocky structure; firm; clear, smooth boundary; pH 7.5.

B3g (37-44″) Gray (5Y 5/1) and olive-gray (5Y 5/2) light silty clay loam; few, fine, faint olive (5Y 5/4) mottles and few, fine, prominent yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular and angular blocky structure; firm; gradual, smooth boundary; pH 7.8.

Cg (44-60″ +) Gray (5Y 5/1) and olive-gray (5Y 5/2) silt loam; few, fine, faint olive (5Y 5/4) mottles and few, fine, prominent yellowish-brown (10YR 5/6) mottles; massive; pH 7.8 in upper portion of horizon, grading to calcareous material at 56 inches; strongly effervescent below 56 inches.

Sawmill Series (107)

The Sawmill series is composed of poorly drained, dark-colored, moderately fine-textured soils that occupy nearly level to depressed areas in the bottomlands of streams in scattered parts of the county. They have developed in the finer textured, dark-colored sediments washed into the flood plains from the upland.

Sawmill soils are deep; they have moderate to moderately slow permeability and very high available water capacity.

Associated soils include Radford (74), Otter (76), and Lawson (451), which are developed in more silty sediments. A few areas are included that are not as dark as normal for this soil.

Two mapping units are shown on the soil map: 107 and W107. The W107 areas are very wet and have a high water table in most seasons.

Sawmill silty clay loam representative profile (107)

A11 (0-7″) Black to very dark gray (10YR 2/1 to 3/1) silty clay loam; moderate, fine to medium, granular structure; firm; clear, smooth boundary; abundant roots; pH 6.5; horizon represents mixed recent deposition.

A12 (7-18″) Black (10YR 2/1) silty clay loam; moderate, fine to medium, granular structure; firm; clear, smooth boundary; abundant roots; pH 6.5.

A3 (18-26″) Very dark gray (10YR 3/1) silty clay loam; specks of pale brown (10YR 6/3) iron concretions present; moderate, fine, subangular blocky structure; firm; clear, smooth boundary; abundant roots; pH 7.0.

B21g (26-30″) Olive-gray (5Y 5/2) silty clay loam; krotovina of very dark gray (10YR 3/1); few, fine, distinct yellowish-brown (10YR 5/6) mottles; iron concretions present; weak, very fine, prismatic, breaking to moderate, fine, angular blocky structure; very firm; clear, smooth boundary; common roots; pH 7.5.

B22g (30-43″) Olive-gray to light olive-gray (5Y 5.5/2) silty clay loam; krotovina of very dark gray (10YR 3/1); a few, fine, distinct dark brown to brown (10YR 4/3) mottles; iron concretions present; moderate, fine to medium, prismatic structure; very firm; clear, smooth boundary; occasional roots; pH 7.0.

Cg (43-60″ +) Gray to light gray (5Y 6/1) to light olive-gray (5Y 6/2) and gray (2.5Y 5/1) silt loam; common, fine, prominent strong brown (7.5YR 5/6 and 5/8) mottles; krotovina of very dark gray (10YR 3/1); iron concretions present; massive; occasional roots; pH 7.0.

Schapville Series (418)

The Schapville series consists of dark-colored, well- and moderately well-drained soils developed partly in loess about 1 to 2½ feet thick and partly in shale bedrock on upland slopes ranging from 4 to 7 percent. They have developed under grass vegetation.

Schapville soils are slowly permeable; they have low to moderate available water capacity.

These soils occur on the isolated shale ridges in the southern part of the county and in the larger shale areas south of Eleroy and southwest of Pearl City. Schapville soils are developed in thinner loess than

The sloping areas on the ridge in the background are mainly Schapville soils; Maquoketa shale bedrock outcrops in a few places. Radford soils occur in the level foreground. (Fig. 25)

Keltner (546) and have darker surface horizons than Derinda (417) and Eleroy (547) soils, with which they are associated. They also occur with Shullsburg (745) and Loran soils (572), which have poorer natural drainage.

Two mapping units are shown on the soil map: 418C2 and 418D2. The profile described has maximum A horizon thickness for these units.

Schapville silt loam representative profile (418C2)

Ap (0-8″) Black (10YR 2/1) to very dark brown (10 YR 2/2) silt loam; weak, fine and medium, subangular blocky structure; friable; abundant roots; pH 7.0; abrupt, smooth boundary.

A3 (8-12″) Very dark grayish-brown (10YR 3/2) light silty clay loam; moderate, fine, subangular blocky structure; friable; plentiful roots; pH 5.6; clear, smooth boundary.

B21t (12-17″) Dark brown (10YR 4/3) silty clay loam; moderate, fine, subangular blocky structure; firm; plentiful roots; thin, discontinuous very dark grayish-brown (10YR 3/2) to dark grayish-brown (10YR 4/2) clay films; some very dark brown (10YR 2/2) root and worm channel fillings; pH 6.0; clear, smooth boundary.

B22t (17-22″) Dark brown (10YR 4/3) to dark yellowish-brown (10YR 4/4) heavy silty clay loam with common, fine, distinct strong brown (7.5YR 5/8) mottles; strong, fine and medium, subangular blocky structure; firm; plentiful roots; continuous brown (10YR 4/3) clay films; common, fine, distinct iron and manganese concretions; pH 6.1; clear, smooth boundary.

IIB23t (22-25″) Olive (5Y 5/3) and pale-olive (5Y 6/3) silty clay with common, medium, distinct yellowish-brown (10YR 5/6) mottles; moderate, medium and coarse, angular blocky structure; very firm; few roots; peds coated with dark grayish-brown (2.5Y 4/2) clay films; root channels coated with very dark gray (10YR 3/1); pH 7.0; clear, smooth boundary.

IIC (25-60″) Light olive-gray (5Y 6/2), greenish-gray (5GY 6/1), and yellowish-brown (10YR 5/6 and 5/8) heavy silty clay shale interbedded with thin layers of brownish-yellow (10YR 6/6) and yellow (10YR 7/8) limestone having shaly coatings of light olive gray (5Y 6/2); shale has massive to weak, coarse, angular blocky structure; very firm; few roots; common, fine, distinct black (10YR 2/1) and very dark gray (10YR 3/1) stains; calcareous.

Shullsburg Series (745)

The Shullsburg series is composed of dark-colored, somewhat poorly drained soils developed partly in loess about 1 to 2½ feet thick and partly in underlying shale bedrock under prairie vegetation. These soils occur on slopes ranging from 2 to 12 percent on the shale uplands, which are most extensive in the southwestern part of Stephenson County.

Shullsburg soils are slowly permeable; they have low to moderate available water capacity.

These soils occur in association with Schapville (418), Keltner (546), Loran (572), and other soils derived in part from shale bedrock. Included with Shullsburg soils on the soil map are a few areas that differ from the representative profile by having developed under mixed prairie-forest vegetation and by containing A2 horizons.

Four mapping units are shown on the soil map: 745B, 745C, 745C2, and 745D2. Some B horizon is mixed with the plow layer in the eroded units.

Shullsburg silt loam representative profile (745B)

Ap (0-7″) Black (10YR 2/1) silt loam; weak, medium, granular structure; friable; abrupt, smooth boundary; pH 7.0.

A12 (7-11″) Black (10YR 2/1) silt loam; moderate, fine and medium, granular structure; friable; clear, smooth boundary; pH 7.0.

B21t (11-15″) Mixed light olive-brown (2.5Y 5/4) and grayish-brown (10YR 5/2) silty clay loam; moderate, fine, subangular blocky structure; firm; discontinuous very dark gray (10YR 3/1) organic-clay coatings; clear, smooth boundary; pH 7.0.

B22t (15-20″) Light olive-brown (2.5Y 5/4) heavy silty clay loam; common, fine, faint grayish-brown (2.5Y 5/2) mottles; moderate, medium, subangular blocky structure; firm; nearly continuous dark grayish-brown (2.5Y 4/2) clay coatings; clear, smooth boundary; pH 7.0.

IIB23t (20-25″) Light olive-brown (2.5Y 5/4) silty clay; few, fine, faint grayish-brown (2.5Y 5/2) and few, fine, distinct yellowish-brown (10YR 5/6) mottles; weak to moderate, medium, subangular blocky structure; very firm; nearly continuous dark grayish-brown (2.5Y 4/2) clay coatings; common black (10YR 2/1) iron-manganese concretions; clear, smooth boundary; pH 7.0.

IIB3t (25-28″) Light olive-brown (2.5Y 5/4) silty clay; few, fine, faint grayish-brown and light brownish-gray (2.5Y 5/2 and 6/2) mottles and common, fine, distinct yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular and angular blocky structure; very firm; discontinuous olive-gray (5Y 4/2) clay coatings; common black (10YR 2/1) iron-manganese concretions; clear, smooth boundary; pH 7.5; weakly calcareous in lower portion.

IIC (28-60″ +) Mixed greenish-gray (5GY 6/1), olive-gray (5Y 5/2), and light olive-brown (2.5Y 5/4 and 5/6) silty clay to clay; small spots of very dark gray (N 3/0) and small white (10YR 8/1) spots of lime; massive to weak, coarse, angular blocky structure; extremely firm; calcareous shale bedrock, strongly effervescent; some small dolomite chunks of yellowish brown (10YR 5/4 and 5/6) and olive yellow (2.5Y 6/6).

Sogn Series (504)

The Sogn series occurs on slopes with gradients ranging from 7 percent to as much as 50 percent, located primarily on steep valley slopes bordering the major drainageways. Dolomitic limestone outcrops are common in these areas; between the outcrops, loess may mantle the rock to depths of about 10 to 15 inches.

These soils have no B horizon in the loess mantle, and there is no clayey residuum at the limestone surface. The surface mantle is neutral to calcareous. Surface color ranges from moderately dark to dark with dark colors dominating even in areas where there is some forest influence. Some areas include much chert; other areas are very low in chert.

Sogn soils are very shallow and well to somewhat excessively drained. They have moderate permeability and very low available water capacity. Most roots are restricted to the profile above the limestone.

The outcrops are usually in-place limestone, but some areas are included (particularly west of Dakota) in which limestone slabs and boulders have been shoved by glacial ice a short distance from their origin.

Many areas of these soils occur along Waddams Creek and the upper portions of the Pecatonica River. Considerable acreage is also found in Jefferson Township in the southwestern corner of the county. Sogn soils occur in a mixed pattern in the eastern part of the county on the steeper slopes in association with Dubuque (29), Woodbine (410), Dodgeville (40), and Hitt (506) soils. Many of the limestone outcrops and cherty areas are shown by special symbols on the soil map, as indicated in the map legend.

Two mapping units are shown on the soil map: 504D2 and 504F2. For these units, the D slope symbol represents a range of slope from 7 to 18 percent, and the F slope symbol, 18 to 50 percent, which is a departure from the normal range of these symbols.

Sogn silt loam representative profile (504D2)

A1 (0-7″) Black (10YR 2/1) silt loam; moderate, medium to fine, granular structure; friable; abundant roots; abrupt, smooth boundary; effervesces strongly.

IIR (7″ +) Very pale brown (10YR 7/3), yellow (10 YR 7/6), and yellowish-brown (10YR 5/8) dolomitic limestone; occasional roots in upper part; effervesces strongly.

St. Charles Series (243)

The St. Charles series consists of light-colored, well- and moderately well-drained soils developed partly in loess or silty material 3 to 5 feet thick and partly in stratified, medium-textured, water-deposited sediments. They have developed under forest vegetation primarily on benches or stream terraces, but they also occur in loess-covered upland outwash areas.

These soils are deep; they have moderate permeability and high to very high available water capacity.

St. Charles soils occur on nearly level to moderately sloping (1 to 7 percent) topography with Camden (134), Batavia (105), Kendall (242), and other soils. Major areas are located on benches along the Pecatonica River and the lower part of Yellow Creek.

Four mapping units, 243A, 243B, 243C, and 243C2, are shown on the soil map. The eroded unit, 243C2, has lost about one-half of the A horizon.

St. Charles silt loam representative profile (243A)

Ap (0-7") Dark grayish-brown (10YR 4/2) silt loam; moderate, fine and medium, crumb structure; friable; abundant roots; abrupt, smooth boundary; pH 7.0.

A2 (7-10") Grayish-brown (10YR 5/2) and brown (10 YR 5/3) silt loam; common, fine, faint yellowish-brown (10 YR 5/6) mottles; common, fine, distinct black (N 2/0) iron-manganese concretions; few very dark grayish-brown (10YR 3/2) wormcasts; many light gray (10YR 7/1) coatings, which disappear when moist; moderate, fine, platy structure; abundant roots; clear, smooth boundary; pH 6.5.

B1 (10-14") Brown to dark brown (10YR 4/3) silt loam; few, fine, distinct black (N 2/0) iron-manganese concretions; few dark grayish-brown (10YR 4/2) wormcasts; some light gray (10YR 7/2) coatings, which disappear when moist; moderate, fine and medium, subangular blocky structure; abundant roots; clear, smooth boundary; pH 6.3.

B21t (14-19") Dark yellowish-brown (10YR 4/4) light silty clay loam; few, fine, distinct black (N 2/0) iron-manganese concretions; some grayish-brown (10YR 5/2) root channel fillings; few light gray (10YR 7/2) coatings, which disappear when moist; thin, discontinuous brown to dark brown (10YR 4/3) and dark yellowish-brown (10YR 3/4) clay coatings; moderate, fine and medium, subangular blocky structure; firm; common roots; clear, smooth boundary; pH 5.0.

B22t (19-26") Dark yellowish-brown (10YR 4/4) silty clay loam; few, fine, distinct black (N 2/0) iron-manganese concretions and stains; thin, continuous brown to dark brown (10YR 4/3) clay coatings; moderate, fine and medium, subangular blocky structure; firm; common roots; clear, smooth boundary; pH 4.7.

B23t (26-41") Dark yellowish-brown (10YR 4/4) silty clay loam; few, fine, distinct black (N 2/0) iron-manganese concretions; one large root channel with brown (10YR 5/3) interior and yellowish-brown (10YR 5/8) and yellowish-red (5YR 4/6) exterior; thin, nearly continuous brown to dark brown (10YR 4/3) clay coatings; moderate, fine and medium, subangular and angular blocky structure; firm; occasional roots; clear, smooth boundary; pH 4.7.

IIB3 (41-48") Dark yellowish-brown (10YR 4/4) silt loam; areas with clay coatings approach silty clay loam; lenses of clay loam; few, fine, distinct black (N 2/0) iron-manganese concretions and stains; several large root channels with brown (10YR 5/3) interiors and yellowish-brown (10YR 5/8) and yellowish-red (5YR 4/6) exteriors; an occasional channel of dark gray (10YR 4/1) clay-organic material; thin, discontinuous brown to dark brown (10YR 4/3) clay coatings, fewer than in horizon above; weak, coarse, angular blocky structure; firm; occasional roots; gradual, smooth boundary; pH 5.1.

IIC (48-65" +) Brown (10YR 4/3) and yellowish-brown (10YR 5/4) silt loam with thin bands of loam and sandy loam; very few black (5YR 2/1) iron-manganese concretions and stains; a few root channels as described in IIB3 horizon; an occasional brown to dark brown (10YR 4/3) clay coating; massive in place, breaking to weak, coarse, angular blocky structure; friable; occasional roots; pH 5.5.

Stronghurst Series (278)

The Stronghurst series is made up of light-colored, somewhat poorly drained soils developed under forest vegetation in loess parent material. These soils are minor in extent; they occur mainly in upland areas but occasionally on low stream terraces, on nearly level topography.

Stronghurst soils are deep; they have moderate to moderately slow permeability and very high available water capacity.

They are most commonly associated with Fayette (280) and Rozetta (279) soils, which also developed in loess, but Stronghurst soils have poorer natural drainage.

The only mapping unit shown on the soil map is 278.

Stronghurst silt loam representative profile (278)

Ap (0-6") Dark grayish-brown (10YR 4/2) silt loam; weak, medium and coarse, subangular blocky and fine, medium and coarse, crumb structure; friable; abrupt, smooth boundary; pH 7.0.

A21 (6-10") Dark grayish-brown (10YR 4/2) silt loam; discontinuous silt coats on all ped surfaces; numerous black (N 2/0) iron-manganese concretions; moderate, thin and medium, platy structure; friable; clear, smooth boundary; pH 7.0.

A22 (10-16") Pale brown (10YR 6/3) silt loam; continuous silt coats on all ped surfaces; numerous black (N 2/0) iron-manganese concretions; strong, medium, platy structure; friable; abrupt, smooth boundary; pH 6.5.

B1t (16-22") Mixed brown (10YR 5/3) and yellowish-brown (10YR 5/4) silty clay loam; few, fine, distinct brown (7.5YR 4/4) and strong brown (7.5YR 5/8) mottles; few, fine, black (N 2/0) iron-manganese concretions; discontinuous silt coats on all ped surfaces; thin, discontinuous brown to dark brown (10YR 4/3) clay coats, mainly on vertical ped surfaces; moderate, medium, subangular and angular blocky structure; firm; clear, smooth boundary; pH 5.8.

B21t (22-34") Light brownish-gray (10YR 6/2) silty clay loam; thick, continuous grayish-brown (2.5Y 5/2) and dark grayish-brown (2.5Y 4/2) clay coats over all ped surfaces; common, fine, distinct strong brown (7.5YR 5/6 and 5/8) mottles; few, fine, black (N 2/0) iron-manganese stains; strong, medium, prismatic structure; very firm; gradual, smooth boundary; pH 6.0.

B22t (34-45") Light grayish-brown (10YR 6/2) silty clay loam; thick, continuous very dark grayish-brown (10YR 3/2) and dark grayish-brown (2.5Y 4/2) clay coats on all ped surfaces; common, fine, distinct strong brown (7.5YR 5/6 and 5/8) mottles; few, fine, black (N 2/0) iron-manganese stains; moderate, medium, prismatic structure; very firm; gradual, smooth boundary; pH 6.3.

B3t (45-59") Grayish-brown (2.5Y 5/2) light silty clay loam; patchy dark grayish-brown (2.5Y 4/2) and very dark grayish-brown (10YR 3/2) clay coats on ped surfaces; common, fine, distinct yellowish-brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; few, fine, black (N 2/0) iron-manganese stains; weak, coarse, subangular and angular blocky structure; firm; gradual, smooth boundary; pH 6.8 in upper part of horizon, increasing to 7.5 in lower part.

C1 (59-101") Light olive-gray (5Y 6/2) silt loam; many, fine and medium, prominent yellowish-brown (10YR 5/6) mottles; few, fine, black (N 2/0) iron-manganese stains;

numerous light gray (2.5Y 7/2) lime concretions; massive; abrupt, smooth boundary; calcareous; strongly effervescent. Loess to 101 inches; stratified loam, silt loam, and sandy-loam outwash below 101 inches.

Tama Series (36)

The Tama series consists of dark-colored, well- and moderately well-drained soils developed under prairie vegetation entirely in loess. These are very extensive and productive soils found in upland areas on slopes of from 0 to 12 percent. Occupying nearly 50,000 acres, this is the dominant soil series in the county.

These soils are deep and moderately permeable. They have very high available water capacity.

Although Tama soils occur occasionally north and east of Freeport, they are most extensive in the prairie areas in western Stephenson County and across the southern portion of the county. Associated soils are Muscatine (41) and Sable (68), which also developed in loess but are more poorly drained than Tama. In some areas Tama soils are also closely associated with Ashdale (411), Ogle (412), and Plano (199) soils.

Five mapping units of Tama are shown on the soil map: 36A, 36B, 36C, 36C2, and 36D2. The last two units have some mixing of B horizon in the plow layer.

Tama silt loam representative profile (36B)

A1 (0-12″) Very dark brown (10YR 2/2) silt loam; moderate, medium to coarse, granular structure with tendency for fine, platy structure; friable; clear, smooth boundary; abundant roots; pH 7.0.

A3 (12-19″) Dark brown (10YR 3/3) silt loam; moderate, medium to coarse, granular structure tending toward moderate, fine, subangular blocky structure; friable; clear, smooth boundary; abundant roots; pH 5.8.

B1t (19-24″) Dark yellowish-brown (10YR 4/4) light silty clay loam; discontinuous very dark grayish-brown (10YR 3/2) coatings, light gray (10YR 7/1) when dry; moderate, fine to medium, subangular blocky structure; friable; clear, smooth boundary; common roots; pH 5.5.

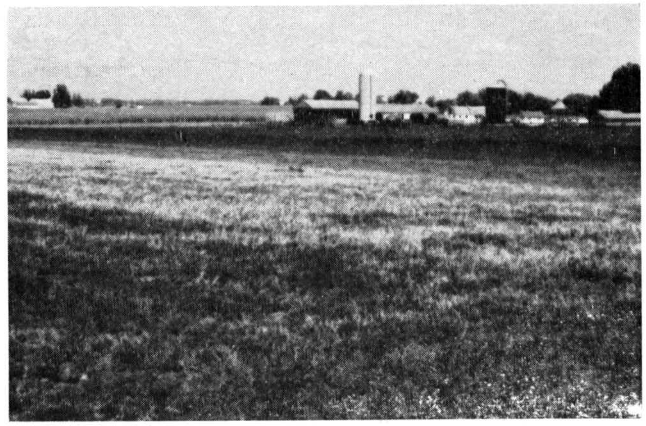
B21t (24-33″) Yellowish-brown (10YR 5/4) silty clay loam; discontinuous brown (10YR 4/3) coatings, light gray (10YR 7/1) when dry; moderate, fine to medium, subangular structure; firm; clear, smooth boundary; occasional roots; pH 5.5.

B22t (33-39″) Yellowish-brown (10YR 5/4) silty clay loam; discontinuous brown (10YR 4/3) coatings, light gray (10YR 7/1) when dry; coatings more abundant than in any horizon above; moderate, fine to medium, subangular blocky structure; firm; clear, smooth boundary; occasional roots; pH 6.0.

B3 (39-55″) Yellowish-brown (10YR 5/4) and grayish-brown (2.5Y 5/2) light silty clay loam; few, fine, distinct dark brown (7.5YR 3/2) mottles; weak, medium to coarse, angular blocky structure; friable; clear, smooth boundary; occasional roots; pH 6.2.

C1 (55-60″) Yellowish-brown (10YR 5/4) and pale brown (10YR 6/3) silt loam; few, fine, faint yellowish-brown (10YR 5/8) mottles; massive; friable; pH 6.5.

C2 (60-78″) Yellowish-brown (10YR 5/4) and pale brown (10YR 6/3) silt loam; a few, fine, faint yellowish-brown (10YR 5/8) mottles; massive; friable; calcareous; glacial till at 78 inches.



Gently to moderately sloping areas of highly productive Tama soils, the most extensive soils in Stephenson County. (Fig. 26)

Thorp Series (206)

The Thorp series is made up of moderately dark, poorly drained soils occurring in level areas or depressions in outwash deposits and on stream terraces. They have developed partly in loess or silty material of variable thickness (often less than 40 inches thick) and partly in medium-textured, stratified, water-laid deposits.

Thorp soils have moderately slow to slow permeability and high available water capacity.

Associated soils are primarily Plano (199), Proctor (148), Elburn (198), Batavia (105), Virgil (104), and Millbrook (219). Thorp soils usually occur as small areas on the soil map.

Only one mapping unit, 206, is shown on the soil map.

Thorp silt loam representative profile (206)

A1 (0-10″) Very dark gray (10YR 3/1) silt loam; moderate, medium and coarse, crumb structure; friable; abrupt, smooth boundary; pH 6.5.

A2 (10-20″) Dark gray and gray (10YR 4/1 and 5/1) silt loam; few iron concretions; moderate, very fine and fine, platy structure; friable; clear, smooth boundary; pH 6.0.

B21t (20-26″) Dark grayish-brown (10YR 4/2) silty clay loam with discontinuous light brownish-gray (10YR 6/2) silt coats and few, fine, faint dark brown (10YR 3/3) mottles; iron concretions; moderate, medium, subangular blocky structure; firm; clear, smooth boundary; pH 5.8.

B22t (26-34″) Dark gray (10YR 4/1) heavy silty clay loam with discontinuous silt coats of pale brown (10YR 6/3) and few, fine and medium, distinct yellowish-brown (10YR 5/4) mottles; iron concretions; strong, fine and medium, prismatic structure; firm; clear, smooth boundary; pH 5.8.

IIB3t (34-40″) Dark grayish-brown (10YR 4/2) heavy clay loam with common, medium, distinct yellowish-brown (10YR 5/4 and 5/6) mottles; iron concretions; moderate, fine and medium, prismatic structure; firm; clear, smooth boundary; pH 6.0.

IIC (40-60″ +) Brown and dark brown (10YR 4/3) and dark yellowish-brown (10YR 4/4) stratified loamy sand, sandy loam, and sandy clay loam; massive; friable; pH 6.5.

Varna Series (223)

The Varna series is composed of dark-colored, moderately well- and well-drained soils developed under prairie vegetation in upland areas on moderately to strongly sloping (4 to 12 percent) topography. These soils have developed in loess less than 2 feet thick and in silty clay loam glacial till. In some areas they are developed entirely in the glacial till. Solum thickness normally ranges from 2 to 3½ feet.

Varna soils have moderately slow to slow permeability and high available water capacity.

These soils occur in small areas, mainly in western Stephenson County, with the greatest acreage in Winslow Township and western Loran Township. Associated soils include Catlin (171) and Tama (36), which occur primarily on ridgetops with Varna soils on the slopes.

Three mapping units are shown on the soil map: 223C, 223C2, and 223D2. The eroded units have lost about one-half of the A horizon.

Varna silt loam representative profile (223C)

Ap (0-8″) Very dark gray and very dark grayish-brown (10YR 3/1 and 3/2) silt loam; weak to moderate, medium, granular structure; friable; abrupt, smooth boundary; pH 6.5.

A3 (8-13″) Very dark grayish-brown (10YR 3/2) heavy silt loam; strong, medium, granular structure; firm; clear, smooth boundary; pH 6.3.

B21t (13-20″) Dark yellowish-brown (10YR 4/4) silty clay loam; thin, discontinuous dark brown (10YR 4/3) clay coats on all ped surfaces; strong, fine, subangular blocky structure; firm; clear, smooth boundary; pH 6.3.

IIB22t (20-27″) Brown (7.5YR 5/2 and 4/2) silty clay; moderately thick, discontinuous dark gray (N 4/0) clay coats on all ped surfaces; strong, fine, prismatic and medium, angular blocky structure; very firm; clear, smooth boundary; pH 7.8.

IIB3t (27-38″) Mixed 85-percent brown (7.5YR 5/4 and 5/3) and 15-percent strong brown (7.5YR 5/6) heavy silty clay loam; common, fine, distinct very dark gray (N 3/0) iron-manganese stains and concretions; very dark grayish-brown (10YR 3/2) channel fillings; moderate, coarse, angular blocky structure; very firm; very weakly calcareous in lower part.

IIC (38-48″ +) Mixed brown (7.5YR 5/3) and strong brown (7.5YR 5/6) silty clay loam; common iron concretions; massive; very firm; strongly calcareous.

Virgil Series (104)

The Virgil series is made up of moderately dark-colored, somewhat poorly drained soils developed partly in loess or silty sediments about 3 to 5 feet thick and partly in medium-textured, stratified, water-deposited sediments. These soils developed in transitional prairie-forest areas on nearly level to gently sloping landscape positions, primarily on benches or stream terraces along the major streams.

Virgil soils are deep and moderately permeable. Available water capacity is high to very high.

They occur with Elburn (198) and Kendall (242) soils, which are developed in similar parent materials. Virgil soils are darker colored than Kendall but lighter colored than Elburn soils. Other associated soils are Batavia (105), St. Charles (243), and Harvard (344).

Two mapping units are shown on the soil map: 104A and 104B.

Virgil silt loam representative profile (104A)

Ap (0-7″) Black (10YR 2/1) silt loam; weak, medium, granular structure; friable; plentiful roots; pH 7.0; abrupt, smooth boundary.

A2 (7-13″) Dark grayish-brown (10YR 4/2) and grayish-brown (10YR 5/2) silt loam with few, fine, distinct dark brown (7.5YR 4/4) mottles; weak, thin, platy, breaking to moderate, fine, granular structure; friable; abundant roots; occasional black (10YR 2/1) spots and channel fillings; pH 5.2; clear, smooth boundary.

B1 (13-17″) Grayish-brown (10YR 5/2) and brown (10YR 5/3) silty clay loam with few, fine, distinct dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; moderate, fine, subangular blocky structure; firm; plentiful roots; few, thin, dark grayish-brown (10YR 4/2) clay films; common silt coatings, light gray (10YR 7/2) when dry; occasional black (10YR 2/1) iron-manganese stains or concretions; pH 5.5; clear, smooth boundary.

B21t (17-25″) Grayish-brown (10YR 5/2) and brown (10YR 5/3) silty clay loam with few, fine, distinct dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; moderate to strong, fine, subangular blocky structure; firm; plentiful roots; discontinuous dark grayish-brown (10YR 4/2) clay films; common silt coatings, light gray (10YR 7/2) when dry; few black (10YR 2/1) iron-manganese concretions; pH 5.5; gradual, smooth boundary.

B22t (25-35″) Light brownish-gray (2.5Y 6/2) silty clay loam with common, fine, prominent strong brown (7.5YR 5/6 and 5/8) mottles; moderate, fine and medium, subangular blocky structure; firm; few roots; few silt coatings, light gray (10YR 7/2) when dry; continuous grayish-brown (2.5Y 5/2) clay films; numerous black (10YR 2/1) iron-manganese concretions; pH 5.5; clear, smooth boundary.

B23t (35-44″) Light brownish-gray (2.5Y 6/2) silty clay loam with many, medium, prominent dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; moderate, medium and coarse, subangular and angular blocky structure; firm; few roots; few clay films, light gray (10YR 5/2) when dry; numerous black (10YR 2/1) iron-manganese concretions; pH 6.0; clear, smooth boundary.

B31 (44-49″) Grayish-brown (2.5Y 5/2) light silty clay loam with many, medium, prominent dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; weak, medium and coarse, angular blocky structure; firm; few roots; patchy gray (2.5Y 5/1) clay films; numerous black (10YR 2/1) iron-manganese concretions; pH 6.0; clear, smooth boundary.

IIB32 (49-58″) Grayish-brown (2.5Y 5/2) and light brownish-gray (2.5Y 6/2) loam to clay loam with many, medium, prominent dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) mottles; weak, coarse, angular blocky structure; firm; no roots; patchy dark gray (2.5Y 4/1) clay films; occasional black (10YR 2/1) iron-manganese concretions; pH 7.0; gradual, smooth boundary.

IIC (58-60″) Dark brown (10YR 4/3) and dark yellowish-brown (10YR 4/4) sandy loam with common, fine, distinct dark gray (10YR 4/1) and gray (10YR 5/1) mottles; massive; friable; pH 7.5.

Warsaw Series (290)

The Warsaw series consists of dark-colored, well-drained soils developed under prairie vegetation on isolated gravel terraces and kames on slopes ranging from 4 to 12 percent. They have developed in 2 to 3½ feet of silty or loamy sediments over calcareous gravel and sand. A few areas are included in which the gravel occurs at shallower or greater depths than these.

Warsaw soils are moderately permeable; they have moderate available water capacity.

These soils do not occur extensively. Some of the larger areas occur just south and east of the junction of Yellow Creek and the Pecatonica River. Associated soils include Rodman-Casco complex (969), Plano (199), Proctor (148), and Hitt (506).

Two mapping units are shown on the soil map: 290C2 and 290D2. The profile described represents maximum A horizon thickness for the mapping units.

Warsaw silt loam representative profile (290C2)

Ap (0-7″) Black (10YR 2/1) gritty silt loam; moderate, medium, granular structure; very friable; gradual, smooth boundary; abundant roots; pH 7.0.

AB (7-10″) Very dark grayish-brown (10YR 3/2) gritty light silty clay loam; many black (10YR 2/1) wormcasts; moderate, fine, subangular blocky structure; friable; clear, smooth boundary; abundant roots; pH 6.8.

B21t (10-18″) Dark brown (10YR 4/3) clay loam; few dark brown (10YR 3/3) wormcasts; thin, discontinuous dark brown (7.5YR 3/2) clay coatings; moderate, medium and coarse, subangular blocky structure; friable; clear, smooth boundary; abundant roots; pH 6.5.

B22t (18-27″) Dark yellowish-brown (10YR 3/4 and 4/4) clay loam; thin, discontinuous dark brown (7.5YR 3/2) clay coatings; moderate, medium and coarse, subangular blocky structure; firm; clear, smooth boundary; abundant roots; pH 6.8.

B3t (27-32″) Dark brown (7.5YR 4/4) gravelly clay loam; moderate, coarse, subangular blocky structure; firm; clear, wavy boundary; common roots; pH 7.0.

IIC (32-50″ +) Mixed very pale brown (10YR 7/4) and yellowish-brown (10YR 5/8) loose stones, gravel, and sand; single grained; occasional roots; effervesces violently.

Westville Series (22)

The Westville series is composed of light-colored, well- and moderately well-drained soils developed in less than 15 inches of loess over glacial drift of dominantly sandy-loam texture. Parent material is mostly till that was leached and weathered prior to loess deposition. These soils developed under forest vegetation on upland slopes with gradients ranging from 4 to 12 percent. Solum thickness is quite variable but normally is greater than 4 feet.

Westville soils are deep; they have moderate permeability and high available water capacity.

These soils occur mainly in the eastern one-half of the county in association with Pecatonica (21), Woodbine (410), Flagg (419), and Kidder (361) soils.

Four mapping units are shown on the soil map: 22C2, 22D2, 22D3, and 22E2. The profile described represents maximum thickness of A horizon. The severely eroded unit, 22D3, has the plow layer primarily in B horizon.

Westville silt loam representative profile (22C2)

A1 (0-4″) Very dark gray (10YR 3/1) silt loam with small areas of brown (10YR 5/3); weak, fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 6.5.

A21 (4-8″) Grayish-brown and brown (10YR 5/2 and 5/3) silt loam with numerous wormcasts of very dark gray (10YR 3/1); weak, thin and medium, platy and fine and medium, crumb structure; friable; abrupt, smooth boundary; pH 6.2.

IIA22 (8-11″) Dark yellowish-brown (10YR 4/4) to brown (7.5YR 4/4) gritty silt loam with few wormcasts of very dark gray (10YR 3/1); weak, medium, crumb structure; clear, smooth boundary; pH 5.8; occasional pebbles.

IIB1t (11-15″) Brown (7.5YR 4/4) gritty light silty clay loam; moderate, very fine and fine, subangular blocky structure; friable; clear, smooth boundary; pH 6.0; occasional pebbles.

IIB21t (15-24″) Brown (7.5YR 4/4) and reddish-brown (5YR 4/4) clay loam with root channel fillings of very dark gray (10YR 3/1) and few, fine, black (5YR 2/1) iron-manganese stains; moderate to strong, fine and medium, subangular blocky structure; firm; clear, smooth boundary; pH 6.0.

IIB22t (24-39″) Brown (7.5YR 4/4) and reddish-brown (5YR 4/4) clay loam with thin, discontinuous reddish-brown (5YR 4/3) and dark reddish-brown (5YR 3/3) clay coatings; few, fine and medium, black (5YR 2/1) iron-manganese stains; moderate, medium, subangular and angular blocky structure; firm to very firm; gradual, smooth boundary; pH 6.0.

IIB23t (39-55″) Reddish-brown (5YR 4/4) gravelly clay loam to gravelly sandy clay loam with discontinuous dark reddish-brown (5YR 3/3 and 3/2) clay coatings; weak, medium to coarse, subangular blocky structure; firm; gradual, smooth boundary; pH 6.0.

IIB3t (55-60″) Reddish-brown (5YR 4/4) heavy sandy loam; weak, medium to coarse, subangular blocky structure; friable; abrupt, wavy boundary; pH 6.5.

IIC (60-72″ +) Brown and dark yellowish-brown (10 YR 4/3 to 4/4) loamy sand and sand drift with some fine gravel; single grained; loose; calcareous, with strong effervescence.

Woodbine Series (410)

The Woodbine series consists of light-colored, well-drained soils developed in loess and glacial drift approximately 3 to 5 feet thick and in limestone residuum over limestone. They have developed under forest vegetation on upland slopes ranging from 2- to 18-percent gradient.

Woodbine soils are deep and moderately permeable. They have moderate available water capacity.

The drift in which these soils developed is usually glacial till, but many areas of water-deposited sediments are included, especially north and northwest of Freeport. Woodbine soils occur most extensively in the eastern one-half of the county, and it is believed that weathering occurred in the drift prior to loess deposition. The drift portion of the solum and the limestone residuum usually have reddish colors. These soils occur with Pecatonica (21) soils, which are deeper to limestone bedrock; Oneco (752) and Hitt (506) soils, which have darker colored, thicker A1 horizons; Dubuque (29) and Palsgrove (429) soils, which are developed in loess only over bedrock; and Flagg (419) soils, which have a thicker loess cover and bedrock below 5 feet. A few areas included with Woodbine soils do not have the residuum layer above the limestone bedrock.

Seven mapping units are shown on the soil map.

Woodbine silt loam representative profile (410B)

A1 (0-4″) Very dark gray (10YR 3/1) gritty silt loam; moderate, fine, crumb structure; friable; pH 6.5; clear, smooth boundary.

A2 (4-9″) Mixed brown (10YR 5/3) and very dark gray (10YR 3/1) silt loam with moderate, thin, platy structure; friable; pH 6.5; gradual, smooth boundary.

B1 (9-12″) Dark yellowish-brown (10YR 4/4) light silty clay loam with moderate, fine and medium, subangular blocky structure; friable; pH 6.0; clear, smooth boundary.

IIB21t (12-16″) Dark brown (7.5YR 4/4) gritty silty clay loam with some sand; weak, fine, subangular blocky structure; slightly firm; pH 5.5; abrupt, smooth boundary.

IIB22t (16-21″) Dark brown (7.5YR 4/4) clay loam with thin, discontinuous dark brown (7.5YR 3/4) clay coatings; moderate, medium, subangular blocky structure; firm; pH 5.5; clear, smooth boundary.

IIB23t (21-30″) Dark brown (7.5YR 4/4) heavy sandy clay loam with thick, discontinuous dark reddish-brown (5YR 3/4) clay coatings; moderate, medium, angular blocky structure; firm; chert and igneous pebbles are common; pH 5.5; clear, smooth boundary.

IIB31t (30-37″) Dark reddish-brown (5YR 3/4) heavy sandy loam; weak, coarse, subangular blocky structure; slightly firm; few, thin, dark reddish-brown (5YR 3/2 and 3/3) clay coatings; pH 5.7; abrupt, wavy boundary.

IIIB32t (37-41″) Dark reddish-brown (5YR 3/4) cherty clay; weak, coarse, angular blocky structure; very firm; pH 5.8; abrupt, wavy boundary; horizon consists primarily of limestone residuum.

R (41″ +) Partially broken and disintegrated dolomitic limestone.

Other mapping units are:

410C

410C2 Some mixing of B horizon in plow layer.

410D

410D2 Some mixing of B horizon in plow layer.

410D3 Plow layer occurs in dark brown silty clay loam B horizon.

410E2 Some mixing of B horizon in plow layer.

INTERPRETATION OF SOILS FOR SPECIFIC PURPOSES

This section has six main parts. First, general management of soils for cropland and pasture is discussed and the soils are grouped into capability units or management groups to show the relative suitability of the soils for crops. The second part, a discussion of crop yields, presents in table form predicted yields of major crops for each mapping unit. Part three discusses use and management of soils for woodland in the county. The fourth part discusses the major groups of wildlife and the use of soils for wildlife. Part five deals with the use of the soils for recreation, and part six consists of soil engineering data and their interpretations.

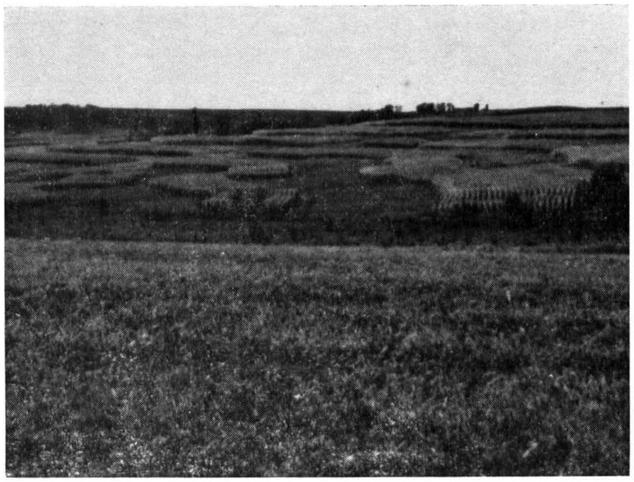
General Management of Soils for Cropland and Pasture

The basic needs in using and managing cultivated soils in Stephenson County are controlling soil erosion, removing excess water, conserving moisture, maintaining favorable tilth and fertility, and using conservation cropping systems. Seeding or renovating perennial pastures and pasture management are important practices to consider when using and managing the soils for pasture. The local personnel of the Soil Conservation Service and the County Extension Adviser can help plan and establish proper soil use and management on specific farms. Management practices for cultivated crops are discussed in the following pages.

Soil Erosion Control. About 80 percent of Stephenson County has slopes subject to erosion. Approximately 75 percent of these slopes are used for cultivated crops. Excessive soil loss can be prevented by using proper proportions of grass and legumes in the cropping sequence. Alternatively, terraces, contour tillage, contour stripcropping, grassed waterways, and plow planting, used separately or in some combination with one another, can be used to control erosion.

Standard terraces are series of earth ridges and channels across the slope. They are constructed to reduce erosion damage by intercepting surface runoff and conducting it at a nonerosive velocity to a stable outlet such as a grassed waterway or onto permanent sod. Standard terraces are suitable for deep, well- and moderately well-drained soils that are primarily moderately permeable and that lie on relatively uniform slopes of less than 12 percent. Standard terraces constructed on soils shallow to bedrock or on irregular slopes greater than about 12 percent will not permit practical and economical installation and maintenance.

Contour tillage is farming on sloping cultivated land so that plowing, land preparation, planting, and cultivation are done with the contour of the land. Contouring is suitable on sloping cropland where the cropping system does not adequately control soil and water losses. Soils too steep for hayland cropping are not suitable for contouring. Cropping systems on slopes



Stripcropping on the contour of the land helps reduce runoff and erosion on sloping cropped areas. This excellent example is in Kent Township. (Fig. 27)

that will cause a higher soil loss than tolerable for contouring are not suitable. Cultivating the slopes with the contour of the land is always part of proper tillage when farming on terraces, farming between trees in orchards planted on the contour, or practicing plow planting.

Contour stripcropping is an arrangement of strips of close-growing crops alternated with strips of clean-tilled crops or fallow. Contour stripcropping is suitable on cropland where the slopes are uniform enough to permit farming operations, on tillable soils that are shallow to bedrock and not suited to terracing, and on soils too erosive for contouring alone to be completely effective.

Grassed waterways are vegetated channels used mainly to conduct runoff from standard terraces and to facilitate contouring and other farming operations. Grasses such as smooth brome and timothy are suited to all soils used for waterways in Stephenson County, except the wet soils, for which reed canarygrass is suitable. Tall fescue is suitable for waterways on all the soils; it is fairly tolerant of drouthy and alkaline to acid soils, and it can be used on wet soils with tight subsoils.

Plow planting is planting a crop at the time the land is plowed, or soon after, without additional tillage operations to prepare a seedbed. Coarse- to moderately fine-textured surface soils are suitable for plow planting.

Removal of Excess Water. About 15 percent of Stephenson County is subject to wetness. Tile drains or surface field ditches are used to remove the excess water.

Tile are earth-covered drains used to lower the water table level, prevent water movement into a wet area, or serve as an outlet for other tile drains. All moderately permeable and moderately slowly permeable soils subject to wetness in Stephenson County will tile-drain satisfactorily. Slowly or very slowly permeable soils and organic soils are not suited for tile drainage in most places.

Perforated pipe are drains used in organic soils. These pipe are commonly in 20-feet-long sections and do not settle out of alignment as readily as ordinary field tile.

Surface field ditches are open drains constructed to drain nearly level or depressional areas. Ditches are used for drainage where the soil is not suitable for tile. Soils with slow permeability are commonly drained by ditches.

Conserving Moisture and Maintaining Favorable Tilth and Fertility. Optimum moisture and favorable tilth and fertility are basic requirements for best possible yields on all cultivated soils in Stephenson County.

Conserving moisture. Preventing soil loss on sloping land by growing forage crops alone or in combination with terraces, contouring, or some other erosion control practice is also very effective in holding rainwater where it falls. Returning crop residues to the soil is also effective in reducing soil loss and increasing water intake. On unprotected sloping land, the surface soil is lost by erosion, causing a reduced intake of water. Because the remaining soil is less absorbent, water runs off the surface and is not conserved for crops.

Moisture can be conserved on nearly level land by controlling weeds and reducing tillage operations to only those needed for high production.

Conserving moisture on drouthy, sandy, gravelly, or shallow to bedrock soils is difficult and, in most cases, very important. Coarse-textured soils such as Dickinson and Rodman have rapid permeability and are unable to store adequate quantities of water for crops. Crop residue management is very important on drouthy soils because the vegetative material incorporated into the soil tends to hold moisture. Mulching also reduces evaporation.

Maintaining favorable tilth. Soil tilth is the condition of the soil, especially the soil structure, in relation to the growth of plants. Favorable tilth refers to a soil that is friable and not difficult to work; it is associated with high, noncapillary porosity and stable, granular structure. Controlling erosion is very important if favorable tilth is to be maintained. On most soils in Stephenson County erosion will remove the more friable surface soil and leave nonfriable, difficult to work, subsoil.

Adding organic matter by returning all residues from intertilled crops and plowing under green manure crops is a very effective way to preserve tilth on medium-textured soils. More favorable tilth and an improved air and water relationship in the heavy-textured soils and severely eroded soils are possible if organic material is returned to the soil, plow planting is practiced, and the soil is not worked when wet. All medium and heavier textured soils will have improved tilth if practices such as crop residue management, reduced tillage, and no tillage when soil is wet are followed. Ordinarily, sandy, gravelly, and organic soils have favorable tilth because of their friable nature.

Maintaining favorable fertility. In Stephenson County most cultivated soils have been farmed too long to determine their natural fertility accurately. However, most of these soils have medium acid to neutral soil reaction (pH 5.6 to 7.3), medium to low amounts of available phosphorus, and high to medium amounts of available potassium.

Dorchester, Harpster, Lena, and Millington soils are naturally high in calcium (calcareous) and do not require additional lime for plant needs. These high-calcium soils do, however, restrict the availability of phosphorus, potassium, and a few minor nutrients. Additions of a readily available form of phosphate and potash will be necessary on these soils.

Most Stephenson County cultivated soils will require periodic additions of agricultural limestone to maintain a favorable calcium level for the crops commonly grown. Most of the soils will require frequent application of phosphate and occasional additions of potash. In most places in Stephenson County, organic, sandy, and gravelly soils and soils high in natural lime are low in potassium. Heavy application of potassium fertilizers will correct this deficiency.

The natural nitrogen level of cultivated Stephenson County soils depends on the amount of organic matter present and is quite variable. For example, Muscatine soils were formed under prairie grasses and have a high organic matter content; soils developed under forest vegetation, such as Fayette and Camden, and all eroded soils have moderate to very low organic matter. Residue management and the use of livestock and green manure are very effective in adding nitrogen to the soils. Although there is no reliable test to indicate the amount of nitrogen a soil will supply for a growing crop, it is helpful to know the kind of soil, the crops to be grown, and the amount and quality of the manure that has been added, when planning a nitrogen program. Commercial nitrogen fertilizer can be used to supplement the nitrogen in the soil and the nitrogen supplied by legumes and animal manure.

Nutrients are lost from the soil mainly by erosion and leaching. The sloping, medium- and moderately fine-textured soils are very susceptible to erosion, and their nutrients are washed away. The coarse-textured soils are very permeable, and water carries nutrients down out of the reach of plant roots. All nutrients are subject to leaching, but nitrogen is the most susceptible. If leaching is a hazard, fertilizing annually or side dressing the crop will reduce fertilizer loss.

Soil tests, which provide an inventory of the nutrients and the acidity level in the soil, are the basis for a good fertility program. In addition to soil tests, a proper fertility program includes consideration of such items as the cropping system being followed, whether livestock or grain farming is intended, the production potential of the soil, and the level of management.

Conservation Cropping Systems. These systems involve growing crops profitably in combination with such management measures as preserving soil and water; maintaining or improving physical, chemical, and biological conditions in the soil; and controlling weeds, insects, and disease. Levels of intensity of cropping of Stephenson County soils are discussed in the following paragraphs. A system less intensive than the one described in the capability units (pp. 64-71) for each group of soils could well be more profitable on many soils. Those cropping systems discussed are very intensive, intensive, moderate, and hayland.

Very intensive cropping is growing mostly row crops, such as continuous corn, corn and soybeans, or other intertilled crops. This system applies to level soils under a high level of management. High-level management (see also page 71) includes adequate drainage, full utilization of residues, use of high-quality seed, high plant population, weed and insect control, high fertility, reduced tillage, no tillage when soil is wet, and timeliness of operations. Heavy-textured soils are subject to blowing if fall plowed and will require wind erosion control. Soils that tend to puddle must be spring plowed. Excessive runoff from adjoining sloping soils needs to be diverted from the lower level areas. On soils subject to frequent flooding, high-level management practices must be flexible for best management.

Intensive cropping is growing row crops and small grain in a sequence, using about one-fourth forage crops. Common cropping sequences of this system are corn-soybeans-corn-small grain-meadow and corn-soybeans-small grain-meadow. This system applies to soils subject to some erosion.

Moderate cropping is growing row crops and small grain in a sequence, using about one-half forage crops. Common cropping sequences of this system are corn-corn-small grain-meadow-meadow, corn-small grain-meadow-meadow, and corn-small grain-meadow-meadow-meadow. This system applies to soils with a moderate to severe erosion hazard.

Hayland cropping is growing mostly forage crops, using row crops and small grains as needed to reestablish hayland. This system applies to soils with a very severe erosion hazard.

General Management Practices for Pastures. The basic practices needed to improve pastures by seeding legumes and grasses apply to all soils. They are briefly as follows:

1. Use lime and fertilizer according to the needs determined by soil tests. On soils with a pH of 5.5 or lower, apply lime several months before seeding and phosphate and potash at time of seeding.
2. Where feasible, remove stones and other obstructions to facilitate good seedbed preparation and management after establishment.
3. On soils to be reseeded to better pasture species, start preparing the seedbed several months before seeding. This will help by eliminating the present species and will provide an opportunity to work lime into the soil. Chemicals can be applied in late summer to kill

unwanted grass on areas to be seeded the following spring.

4. Inoculate legumes. Early spring is generally the best time to seed most legume-grass mixtures. Alfalfa and most grass species can also be seeded in late August.

5. One and a half bushels of oats per acre can be planted with the pasture mixture to help control erosion and weeds. Soils of less than 18-percent slope need to be plowed on the contour. Soils on 18- to 30-percent slopes can be cultivated in such a way that a mulch is left on the surface without plowing.

6. Cover grass and legume seed lightly or about ¼- to ½-inch deep.

7. Graze the oat crop when it is about 8 inches high to keep it from competing with the young forage plants. Do not graze the new seeding when the field is muddy or during September, and avoid overgrazing throughout the season.

8. Promote uniform grazing by providing for the proper location of salt and watering places.

Careful management of pasture plants is required to provide a satisfactory yield of good quality forage and to maintain a vigorous stand. To avoid overgrazing, an adequate amount of forage must be provided, based on the expected yield from all pastures and the livestock numbers to be grazed during the season.

Desirable grazing management practices for bromegrass, timothy, orchardgrass, and other common tame grasses are as follows:

1. Delay grazing in spring until the soil is firm and vegetative growth is at least 4 inches high. Apply about 80 pounds of nitrogen per acre early each spring.

2. Graze moderately. Do not graze when the grasses are down to about 2 inches. When grasses have been grazed, move the livestock to another pasture that has proper growth.

3. Clip the pasture if the forage has been grazed unevenly or if clipping is necessary to control weeds or brush. Clipping to about 4 inches will help spread some of the droppings and encourage a more uniform regrowth and regrazing. Clip just prior to moving cattle so they can eat some of the wilted vegetation after it is mowed.

Grazing management for legume-grass pastures is planned for the legume component but is also satisfactory for all tame grasses. Desirable grazing management practices for legume-grass pastures are these:

1. Top-dress regularly with phosphorus, potassium, and lime according to needs indicated by soil tests.

2. Delay grazing in spring until upright legumes such as alfalfa have made a growth of 8 to 10 inches and prostrate-type legumes such as ladino or empire birdsfoot have made a growth of about 6 to 8 inches.

3. Provide an adequate number of fields with sufficient acreage in ratio to the number of livestock to allow the legumes to make a growth recovery to the heights just indicated, or higher, between each grazing. Satisfactory grazing and rest periods are governed by practical considerations. A short period of grazing is better for the legume than a long period because there is less tramping or waste of forage and less soil compaction. A long rest period is necessary to maintain legume root reserves and to prolong the life and productivity of the stand.

4. Remove livestock when most of the forage has been grazed down to about 2 inches.

5. Clip the stubble if the pasture has been grazed unevenly or if tall grass is left in bunches that could smother legumes. A day or so before the cattle are moved to the next field, clip to about 4 inches.

6. Do not graze perennial legumes from September 1 to October 10 to allow for a recovery growth period to increase root reserves.

Suitable forage species to sow on a given soil when renovating or establishing permanent pasture are given for each capability unit description in the following section.

CAPABILITY GROUPING OF STEPHENSON COUNTY SOILS

Capability classification groups soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on the limitations of the soils, the risk of damage when they are used for the ordinary field crops or seeded pastures, and the way they respond to treatment. The classification does not apply to horticultural crops or to rice and other crops that have their own special requirements for economical production. The soils are classified according to degree and kind of permanent limitations but without consideration of possible major reclamation or of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soils.

In the capability system, all the soils are grouped at three levels — capability class, subclass, and unit. These are discussed in the following paragraphs.

Capability classes, the broadest grouping, are designated by Roman numerals I through VIII to indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have some limitations that reduce the choice of plants or require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that restrict the choice of plants, require very careful management, or both.

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife food and cover.

Class VI soils have severe limitations that make them generally unsuited to cultivation without major reclamation and limit their use largely to pasture, woodland, or wildlife food and cover.

Class VII soils have very severe limitations that make them unsuited to cultivation without major reclamation and restrict their use largely to woodland or wildlife food and cover.

Class VIII soils and landforms have limitations that preclude their use for commercial plant production without major reclamation and restrict their use to recreation, wildlife, water supply, or aesthetic purposes. There are no Class VIII soils in Stephenson County.

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; *w* shows that water on or in the soil interferes with plant growth or cultivation; *s* shows that the soil is limited mainly because it is shallow, drouthy, or stony; and *c* shows that the chief limitation is climate that is too cold or too dry (no c subclasses occur in Stephenson County).

Capability units, sometimes referred to as *management groups,* are soil groups within the subclasses. The soils grouped in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Capability units are generally designated by adding an Arabic numeral to the subclass symbol — for example, IIe-1 or IIIe-3.

Capability classifications of the soils in Stephenson County are listed below and in the Guide to Mapping Units (pages 129-132).

CAPABILITY UNITS

In the following pages the capability units in Stephenson County are described and suggestions for use and management for the soils of each unit are given.

Capability Unit I-1. The soils in this unit are Batavia (105A), Downs (386A), Harvard (344A), Huntsville (77), Plano (199A), Proctor (148A), Rozetta (279A), St. Charles (243A), and Tama (36A).

This unit consists of dark-, moderately dark-, and light-colored soils. They occupy nearly level upland, terrace, or bottomland positions. They are deep, moderately well or well drained, and have medium-textured surface soils and moderately fine- or medium-textured subsoils or subsurfaces.

These soils are moderately permeable and have very high and high available water capacity. They have favorable natural fertility and are very productive if properly managed. The natural organic matter content of St. Charles and Rozetta is lower than in the other soils in this group. Because of its bottomland position, Huntsville is subject to overflow.

These soils are primarily used and well suited for growing corn. If these soils are used for growing pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, and orchardgrass are suitable for seeding. Unless there is an existing stand of trees, the soils in this unit are seldom used for woodland.

If these soils are properly managed, they are suited to very intensive cropping. Intertilled crops such as corn and soybeans can be grown using legumes and grasses such as alfalfa and bromegrass to maintain a satisfactory physical condition in the soil. Because St. Charles and Rozetta have a lower organic matter content than the other soils in the group, they will require more frequent use of legumes and grasses to maintain favorable tilth.

Capability Unit I-2. The soils in this unit are Atterberry (61A), Elburn (198A), Lawson (451), Millbrook (219), Muscatine (41A), Orion (415), Radford (74), and Virgil (104A).

This unit consists of dark-, moderately dark-, and light-colored soils. They occupy nearly level upland, terrace, or bottomland positions. They are deep, somewhat poorly drained, and have medium-textured surface soils and moderately fine- or medium-textured subsoils or subsurfaces.

These soils are moderately permeable and have very high or high available water capacity. They have favorable natural fertility and are very productive if properly managed. The natural organic matter content of Orion is lower than in the other soils in the group. Because of their bottomland position, Radford, Orion, and Lawson are subject to overflow.

These soils are mainly used and well suited for growing corn. If these soils are adequately drained and used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, timothy, bromegrass, orchardgrass, or red, ladino, or alsike clover are suitable for seeding. These soils are seldom used for woodland.

If these soils are properly managed, they are suited to very intensive cropping. Row crops such as corn and soybeans can be grown using legumes and grasses such as red clover and timothy to maintain a satisfactory physical condition in the soil. Because Orion has a lower organic matter content than the other soils in the group, it will require more frequent use of legumes and grasses to maintain favorable tilth. Where improved drainage is needed for increased production and ease of operation, tile will function satisfactorily if outlets are available. The flood hazard on the bottomland soils subject to overflow could be reduced if the upland soils are adequately protected by conservation measures.

Capability Unit IIe-1. The soils in this unit are Argyle (227B, 227C, 227C2), Ashdale (411B, 411C, 411C2), Batavia (105B, 105C), Birkbeck (233B, 233C2), Camden (134B, 134C, 134C2), Catlin (171B, 171C, 171C2), Downs (386B, 386C, 386C2), Durand (416B, 416C, 416C2), Eleroy (547B, 547C, 547C2), Fayette (280B, 280C, 280C2), Flagg (419B, 419C, 419C2), Harvard (344B, 344C, 344C2), Hitt (506B, 506C, 506C2), Keltner (546B, 546C, 546C2), Massbach (753B, 753C, 753C2), Miami (27C2), Myrtle (414B, 414C, 414C2), Nasset (731B, 731C, 731C2), Octagon (656C2), Ogle (412B, 412C, 412C2), Oneco (752C, 752C2), Palsgrove (429B, 429C, 429C2), Parr (221B, 221C, 221C2), Pecatonica (21B, 21C, 21C2), Plano (199B, 199C, 199C2), Proctor (148B, 148C, 148C2), Rozetta (279B), St. Charles (243B, 243C, 243C2), Tama (36B, 36C, 36C2), Varna (223C, 223C2), Westville (22C2), and Woodbine (410B, 410C, 410C2).

This unit consists of dark-, moderately dark-, and light-colored soils. They occupy gently sloping and moderately sloping upland and terrace positions. They are deep, moderately well or well drained, and have medium-textured surface soils and predominantly moderately fine-textured subsoils.

All the soils in this unit have very high to high available water capacity except Woodbine, Ashdale, Palsgrove, Hitt, Nasset, and Oneco, which are underlain by limestone bedrock at about 3- to 5-foot depths and have only moderate available water capacity. Most of the soils in this unit are moderately permeable, except Varna, which has moderately slow to slow permeability. Keltner, Eleroy, and Massbach soils have lower subsoils developed in slowly permeable shale. All the soils in this unit have favorable natural fertility and are very productive if properly managed. The soils in this unit are subject to some surface runoff and erosion in cultivated areas. The organic matter content ranges from high to low.

These soils are mainly used and well suited for growing corn, oats, and alfalfa-brome hay. If these soils are used for growing pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, and orchardgrass are suitable for seeding. Unless there is an existing stand of trees, the soils in this unit are seldom used for woodland.

The gently sloping soils in the unit are suited to intensive cropping. Intertilled crops such as corn and soybeans can be grown in a sequence with small grain and a stand-over meadow crop. The moderately sloping soils in the group are more suited to moderate cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and two years of meadow. More row crops can be grown if erosion control practices are established. To maintain desirable tilth, a greater proportion of meadow crops to row crops will be needed on the moderately eroded soils and on soils developed under forest vegetation. (Refer to the section in this report "Descriptions of Stephenson County Soils" to determine the native vegetation of a given soil in this unit.) In addition to conservation cropping on these soils, erosion control practices, such as contour tillage and terraces, are suitable for decreasing runoff.

Capability Unit IIe-2. The soils in this unit are Atterberry (61B), Elburn (198B), Kendall (242B), Loran (572B, 572C), Muscatine (41B), Ridott (743B, 743C), and Virgil (104B).

This unit consists of dark-, moderately dark-, and light-colored soils. They occupy gently sloping and moderately sloping upland and terrace positions. They are deep, somewhat poorly drained, and have medium-textured surface soils and moderately fine-textured subsoils.

These soils are moderately permeable except Loran and Ridott soils have lower subsoils developed in slowly permeable shale and the permeability of Atterberry ranges to moderately slow. They have very high to high available water capacity except that Loran and Ridott range to moderate. All the soils in this unit have favorable natural fertility and are very productive if properly managed. The soils in this unit are subject to some surface runoff and erosion in cultivated areas. These soils have a high water table during part of the year, and seasonal wetness is a limitation. The natural organic matter content of Kendall is lower than the other soils in the group.

These soils are mainly used and well suited for growing corn, oats, and alfalfa-brome hay. If these soils are adequately drained and used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, timothy, bromegrass, orchardgrass, or red, ladino, or alsike clover are suitable for seeding. The soils in this unit are seldom used for woodland.

The gently sloping soils in the group are suited to intensive cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and a stand-over meadow crop. The moderately sloping soils in the group are better suited to moderate cropping. Intertilled crops such as corn and soybeans can be grown in a sequence with small grain and two years of meadow. More row crops can be grown if erosion control practices such as terraces and contour tillage are used to reduce runoff. If these soils need additional drainage as an improvement measure for increased production and ease of operation, tile will function adequately.

Capability Unit IIw-1. The soils in this unit are Calamine (746B), Dorchester (239), Dorchester, cobbly subsoil variant (578), Drummer (152), Harpster (67), Millington (82), Otter (76), Sable (68), and Sawmill (107).

This unit consists of dark- and moderately dark-colored soils. They occupy nearly level or gently sloping upland, terrace, or bottomland positions. They are deep except for some of the Dorchester, cobbly subsoil variant soils and have medium- or moderately fine-textured surface soils and medium- to fine-textured subsoils or subsurfaces. All the soils in this unit are poorly drained except Dorchester and Dorchester, cobbly subsoil variant, which are mostly somewhat poorly drained but range in places to moderately well drained.

These soils are moderately permeable except Calamine soils, which have lower subsoils developed in slowly permeable shale; Sawmill ranges to moderately slowly permeable. Most of these soils have very high available water capacity. Dorchester, cobbly subsoil variant and Millington have high available water capacity. The organic matter content is predominantly high and the soils are highly productive. Wetness is a permanent limitation of these soils. Because of their bottomland position, Otter, Millington, Sawmill, Dorchester, and Dorchester, cobbly subsoil variant are subject to occasional damaging overflow.

These soils are mostly used and well suited for corn production. If these soils are used for growing pasture, legumes and grasses such as alsike or ladino clover, birdsfoot trefoil, timothy, or reed canarygrass are suitable for seeding. The soils in this unit are rarely used for woodland.

If these soils are properly managed, including being adequately drained, they are suited to very intensive cropping. Row crops such as corn and soybeans can be grown using legumes and grasses such as alsike clover and timothy to maintain a desirable air and water relationship in the soil. Harpster, Millington, Dorchester, and Dorchester, cobbly subsoil variant have unfavorable natural fertility. These soils are naturally high in lime, causing the availability of phosphorus and some of the minor nutrients to be reduced. Annual applications of superphosphate on these high-lime soils will be more readily available to the crops than bulk additions. Unless drainage systems have been installed, improved drainage is needed for higher yields and ease of operation. If outlets are available, tile will function satisfactorily on all the soils needing drainage. The flood hazard on the bottomland soils subject to overflow in this unit could be reduced if the upland soils are adequately protected by conservation measures.

Capability Unit IIw-2. The soils in this unit are Kendall (242A) and Stronghurst (278).

This unit consists of light-colored soils that occupy nearly level upland or terrace positions. They are deep, somewhat poorly drained, and have medium-textured surface soils and moderately fine-textured subsoils.

These soils are moderately permeable, with some of the Stronghurst ranging to moderately slow, and have very high to high available water capacity. The soils in this unit have favorable natural fertility and are very productive if properly managed. These soils have a high water table during part of the year, and seasonal wetness is a limitation. These soils developed under forest vegetation, causing the organic matter content to be somewhat low.

These soils are mainly used and well suited for growing corn, oats, and alfalfa-brome hay. If these soils are adequately drained and used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, timothy, bromegrass, orchardgrass, or red, ladino, or alsike clover are suitable for seeding. Most areas of these soils have been cleared of trees and brush and are not used for woodland.

The soils in this unit are suited to intensive cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and a stand-over meadow crop. Because the organic matter content is somewhat low, legumes and grasses will help maintain a satisfactory physical condition in the soil. Where improved drainage is needed for increased production and ease of operation, tile will function satisfactorily if outlets are available.

Capability Unit IIw-3. The soils in this unit are Edgington (272) and Thorp (206).

This unit consists of dark- or moderately dark-colored "gray spot" soils that occupy either depressions or nearly level upland or terrace positions. They are poorly drained, with medium-textured surface soils and moderately fine- or fine-textured subsoils that somewhat inhibit root penetration.

The soils in this unit have moderately slow to slow permeability and high available water capacity. The soils have favorable natural fertility, but because of some restrictions to root penetration crop yields will commonly be less than yields on neighboring soils. Wetness is a permanent limitation of these soils. The total organic matter content of these soils is somewhat low, since the darker immediate surface layer rests upon a light-colored subsurface layer low in organic matter.

These soils are mainly used for growing corn. If these soils are used for growing pasture, legumes and grasses such as alsike or ladino clover, birdsfoot trefoil, timothy, or reed canarygrass are suitable for seeding. The soils in this unit are rarely used for woodland.

The soils in this unit are suited to intensive cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and a stand-over meadow crop. Since the organic matter content is somewhat low, legumes and grasses will help maintain a satisfactory physical condition in the soil. These soils have a high water table during a part of the year and drainage is needed. Shallow surface ditches can be used since tile do not function well in these high-clay soils.

Capability Unit IIIe-1. The soils in this unit are Argyle (227D2), Ashdale (411D2), Birkbeck (233-D2), Camden (134D2), Catlin (171D2), Downs (386D2), Durand (416D2), Eleroy (547D2), Fayette (280D, 280D2), Flagg (419D2), Harvard (344D2), Hitt (506D2), Keltner (546D2), Massbach (753D2), Miami (27D2), Myrtle (414D2), Nasset (731D2), Octagon (656D2), Ogle (412D2), Oneco (752D2), Palsgrove (429D, 429D2), Parr (221D2), Pecatonica (21D2), Proctor (148D2), Tama (36D2), Westville (22D2), and Woodbine (410D, 410D2).

This unit consists of dark-, moderately dark-, and light-colored soils. They occupy strongly sloping upland and terrace positions. They are deep, moderately well or well drained, and have medium-textured surface soils and predominantly moderately fine-textured subsoils.

All the soils in this unit have very high to high available water capacity except for Woodbine, Ashdale, Palsgrove, Hitt, Nasset, and Oneco. These six soils are underlain by limestone bedrock at about 3- to 5-foot depths, and the available water capacity is only moderate. Most of the soils in this unit are moderately permeable; however, Keltner, Eleroy, and Massbach soils have lower subsoils developed in slowly permeable shale. All the soils in this unit have favorable natural fertility and are very productive if properly managed. They are subject to severe surface runoff and erosion if cultivated. Their organic matter content ranges from medium to low.

These soils are mainly used for growing corn, oats, hay, or pasture. If these soils are used for growing pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, and orchardgrass are suitable for seeding. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to moderate cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and about one-half meadow. More intertilled crops can be grown if erosion control practices are established. To maintain desirable tilth, a greater proportion of meadow to row crops will be needed on the moderately eroded soils and on soils developed under a forest vegetation. (Refer to "Description of Stephenson County Soils" to determine the native vegetation of a given soil in this unit.) In addition to conservation cropping on these soils, erosion control practices such as contour tillage, terraces, or contour stripcropping are effective for decreasing runoff.

Some Palsgrove soils designated as 429D2 on the detailed soil maps have slopes ranging from 7 to 18 percent. The slopes greater than 12 percent are subject to very severe erosion. A cropping system with a dominance of forage crops is needed to protect these very strongly sloping areas from damaging erosion.

Capability Unit IIIe-2. The soils in this unit are Derinda (417C2), Dodgeville (40C, 40C2), Dubuque (29C, 29C2), Morley (194C, 194C2, 194D2), Schapville (418C2), and Varna (223D2).

This unit consists of dark- and light-colored soils. They occupy moderately sloping to strongly sloping upland positions. They are moderately well and well drained and have medium-textured surface soils and moderately fine- and fine-textured subsoils.

The soils in this unit have mainly moderately slow or slow permeability. Except for those formed partly in silty clay loam till, this group of soils has moderate to low available water capacity. Morley and Varna soils, derived from till, have high available water capacity. Soils in this unit have favorable natural fertility, but solid bedrock or high clay content material at depths usually between 20 and 40 inches commonly reduces crop yields. The organic matter content ranges from high to low. The soils in this unit are subject to severe surface runoff and erosion if cultivated. Dubuque, Dodgeville, Derinda, and Schapville have limestone or shale material in the root zone, causing drouthiness to be a secondary limitation.

These soils are used for growing corn, oats, hay, or pasture. If these soils are used for growing pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suitable for seeding. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to moderate cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and about one-half meadow. More intertilled crops can be grown if erosion control practices are established. To maintain desirable tilth, a greater proportion of meadow to row crops will be needed on the moderately eroded soils and on soils developed under a forest vegetation. (Refer to "Description of Stephenson County Soils" to determine the native vegetation of a given soil in this unit.) In addition to conservation cropping, erosion control practices such as contour tillage or contour stripcropping are effective for decreasing runoff on these soils.

Capability Unit IIIe-3. The soils in this unit are Casco-Fox complex (972C2), Dickinson (87B, 87C2), Griswold (363D2), Kidder (361D2), and Warsaw (290C2, 290D2).

This unit consists of dark- to light-colored soils. They occupy gently sloping to strongly sloping upland and terrace positions. They are well drained and have medium- to moderately coarse-textured surface soils and moderately coarse- to moderately fine-textured subsoils.

The soils in this unit have moderate to rapid permeability and moderate to low available water capacity. Most of these soils have favorable natural fertility but have unfavorable coarse-textured material at depths of less than 40 inches. Because of this limited root zone, crop yields will be reduced; fertilizer additions, however, based on the needs of the crop, will help increase production. Most of the soils in this unit are subject to severe surface runoff and erosion if cultivated. Dickinson soils are sandy and very permeable, and the hazard of runoff is less than for the other soils in this unit. Most of these soils have coarse-textured material in the root zone, causing drouthiness to be a secondary limitation. The natural organic matter content ranges from medium to low.

These soils are used mostly for growing bluegrass pasture or alfalfa-brome hay. When these soils are used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suitable for seeding. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to moderate cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and about one-half meadow. More intertilled crops can be grown if erosion control practices such as contour tillage or contour stripcropping are used to control runoff and erosion. Dickinson soils are susceptible to soil blowing. Wind strips that include close-growing crops such as oats, alfalfa, and bromegrass in the cropping system are effective for wind erosion control. To maintain desirable tilth, a greater proportion of meadow crops to row crops will be needed on the moderately eroded soils. The calcareous gravel near the surface of the Warsaw and Casco and Fox soils causes less favorable rooting than in the other soils in this group. Legumes are heavy feeders of calcium, and legume root penetration into the calcareous gravel is greater than for row crops and small grains.

Some Kidder soils designated as 361D2 on the detailed soil maps have slopes ranging from 7 to 18 percent. The slopes greater than about 12 percent are subject to very severe erosion. A cropping system with a dominance of forage crops is needed to protect these steeper slopes from damaging erosion.

Capability Unit IIIe-4. The soils in this unit are Fishhook-Atlas complex (971C2), Keller-Coatsburg complex (970C2), and Shullsburg (745B, 745C, 745C2).

This unit consists of dark- to light-colored soils. They occupy gently sloping to moderately sloping upland positions. They range from poorly to moderately well drained but are mostly somewhat poorly drained. The surface soils have medium texture and the subsoils are moderately fine and fine textured.

The soils in this unit have slow to very slow permeability and moderate to high available water capacity. These soils have favorable natural fertility, but material with high clay content occurs at less than 40 inches deep. Because of this limited root zone, crop yields will be reduced; fertilizer additions, however, based on the needs of the crop, will help increase production. The soils in this unit are subject to severe surface runoff and erosion if cultivated. These soils have a high water table during part of the year, and seasonal wetness is a limitation. The natural organic matter content ranges from high to low.

These soils are used mostly for growing corn, oats, hay, or pasture. If these soils are used for growing permanent pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, timothy, bromegrass, orchardgrass, or red, ladino, or alsike clover are suitable for seeding. Information about the kinds of trees to plant or the management of wooded areas is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to moderate cropping. Row crops such as corn and soybeans can be grown in a sequence with small grain and one-half meadow. More row crops can be grown if erosion control practices such as contour tillage or contour stripcropping are used to reduce runoff. To maintain desirable tilth, a greater proportion of meadow crops to row crops will be needed on the moderately eroded soils. If these soils need additional drainage, the slow permeability limits the use of tile. Engineering assistance will be needed to design and install special drainage systems.

Capability Unit IIIw-1. The soils in this unit are Houghton (103) and Lena (210).

This unit consists of dark-colored organic soils that are deep and very poorly drained. These soils lie on nearly level to depressional terrace or bottomland positions.

These soils have variable permeability with an estimated average of about moderate permeability and have very high available water capacity. They are highly productive if the water table level is adjusted as necessary for favorable rooting. Because these soils are organic in nature, they have a higher organic matter content than other soils in the county. Wetness and frequent overflow are permanent hazards of these soils. If the water table is lowered below the root zone, drouthiness can be a secondary limitation.

These soils are mostly used for growing corn or for pasture. If these soils are used for growing pasture, legumes and grasses such as alsike clover, timothy, or reed canarygrass are suitable for seeding. If these soils have improved drainage, alfalfa, bromegrass, birdsfoot trefoil, or orchardgrass is suitable for seeding. The soils in this unit are seldom used for woodland.

If these soils are properly managed, including being adequately drained and irrigated, they are suited to very intensive cropping. In addition to growing mostly corn or soybeans, high-profit crops such as potatoes, onions, lettuce, or celery can be grown. Unless drainage systems have been installed, improved drainage is needed for best yields. Perforated long tile are more satisfactory than regular field tile because the shorter tile may move or settle out of alignment. If tile drainage lowers the water table below the root zone, irrigation systems will be necessary during the growing season. The Lena soil in this unit has unfavorable natural fertility because of its high lime content. Lime reduces the availability of phosphorus and some of the minor nutrients. Superphosphate applied periodically on this high lime soil will be more readily available to the crops than bulk additions. If the soils with high organic matter content are excessively drained, fertilizer, applied as needed by the specific crop, will help avoid nutrient leaching. If the water table is permanently lowered artificially or by dry seasons, these soils are subject to blowing by wind. Wind strips that include the use of close-growing crops such as grass and legumes in the cropping system are an effective wind erosion control practice. Artificial flooding after the crops are harvested will temporarily prevent these soils from drying out and being blown by the wind.

Capability Unit IVe-1. The soils in this unit are Camden (134D3, 134E2), Fayette (280D3, 280E2), Miami (27D3, 27E2), Westville (22D3, 22E2), and Woodbine (410D3, 410E2).

This unit consists of light-colored eroded soils. They occupy strongly to very strongly sloping upland and terrace positions. They are deep, moderately well or well drained, and have medium- or moderately fine-textured surface soils and moderately fine-textured subsoils.

All the soils in this unit have high available water capacity except Woodbine soils, which are underlain by limestone bedrock at about 3- to 5-foot depths and have moderate available water capacity. The permeability of soils in this unit is moderate. All the soils in this unit have favorable natural fertility and are very productive if properly managed. The organic matter content ranges from low to very low. These soils are subject to very severe surface runoff and erosion if cultivated.

These soils are used mainly for growing corn, oats, hay, or pasture. If they are used for growing permanent pasture, legumes and grasses such as alfalfa, red clover, bromegrass, timothy, or orchardgrass are suitable for pasture planting or renovation. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to hayland cropping. Forage crops like those given for pasture planting can be grown using corn or soybeans and small grain as needed to reestablish hayland. Elimination of the row crop when reestablishing meadow will help improve tilth. If higher profit row crops are needed, conservation practices such as contour tillage or contour stripcropping are effective for decreasing runoff and erosion.

Some Fayette soils designated as 280E2 on the detailed soil maps have slopes ranging from 12 to 30 percent. Most slopes greater than 18 percent are too steep to farm. Permanent cover is essential for effective erosion control on these steep slopes.

Capability Unit IVe-2. The soils in this unit are Derinda (417D2), Dodgeville (40D2), Dubuque (29D, 29D2), Morley (194E2), and Schapville (418D2).

This unit consists of moderately dark- to light-colored soils. They occupy strongly sloping to very strongly sloping upland positions. They are moderately well and well drained and have medium-textured surface soils and moderately fine- and fine-textured subsoils.

The soils in this unit have moderately slow or slow permeability and mostly moderate available water capacity. Morley soils have a high available water capacity; Derinda and Schapville soils range from moderate to low. Soils in this unit have favorable natural fertility, but solid rock or material high in clay content occurs at depths of less than 40 inches. Because of these limitations for deep rooting, crop yields will commonly be reduced. The organic matter content ranges from medium to low. The soils in this unit are subject to very severe surface runoff and erosion if cultivated. Dubuque, Dodgeville, Derinda, and Schapville have limestone or shale material in the root zone, causing drouthiness to be a secondary limitation.

These soils are used mostly for growing corn, oats, hay, or pasture. If these soils are used for growing pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suited for pasture planting or renovation. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to hayland cropping. Forage crops such as alfalfa and bromegrass can be grown using corn or soybeans and small grain as needed to reestablish hayland. Elimination of the row crop when reestablishing meadow will help improve tilth on the eroded soils and on the soils developed under timber vegetation. (Refer to "Description of Stephenson County Soils" to determine the natural vegetation of a given soil in this unit.) If higher profit row crops are needed, conservation practices such as contour tillage or contour stripcropping are effective for decreasing runoff and erosion.

Capability Unit IVe-3. The soils in this unit are Casco-Fox complex (972D2) and Kidder (361D3).

This unit consists of light-colored eroded soils. They occupy strongly sloping upland and terrace positions. They are well drained and have predominantly medium-textured surface soils and moderately fine-textured subsoils.

The soils in this unit have moderate permeability and moderate to low available water capacity. They have favorable natural fertility but are only shallow to moderately deep to unfavorable calcareous coarse material. Because of this limited depth, crop yields will be reduced. Fertilizer additions, based on the needs of the crop, will help increase yields. The soils in this unit are subject to very severe surface runoff and erosion if cultivated. Since these soils have coarse-textured material in the root zone, drouthiness is a secondary limitation. The organic matter content is low.

These soils are used mainly for growing bluegrass pasture or alfalfa-brome hay. If these soils are used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suitable for seeding. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to hayland cropping. Forage crops like those suggested for pasture use can be grown using corn or soybeans and small grain as needed to reestablish hayland. Elimination of the row crop when reestablishing meadow will help improve tilth. If higher profit row crops are needed, conservation practices such as contour tillage or contour stripcropping are effective for decreasing runoff and erosion. The calcareous coarse material near the surface of these soils causes unfavorable root penetration. Legumes are heavy feeders of calcium and will tend to root deeper into the calcareous material than the row crops or small grains.

Capability Unit IVe-4. The soils in this unit are Fishhook-Atlas complex (971D2), Keller-Coatsburg complex (970D2), and Shullsburg (745D2).

This unit consists of moderately dark- and light-colored soils. They occupy strongly sloping upland positions. They range from poorly drained to moderately well drained but are mostly somewhat poorly drained. The surface soils have medium texture and the subsoils are moderately fine and fine textured.

The soils in this unit have slow to very slow permeability and moderate to high available water capacity. These soils have favorable natural fertility, but material high in clay content occurs at less than 40 inches deep. Because of some restriction to rooting, crop yields will be reduced. Fertilizer additions, based on the needs of the crop, will help increase yields. The soils in this unit are subject to very severe surface runoff and erosion if cultivated. These soils have a high water table during part of the year, and seasonal wetness is a limitation. The organic matter content of the soils is moderate to low.

These soils are used mainly for growing corn, oats, hay, or pasture. If these soils are used for growing pasture, legumes and grasses such as alfalfa, birdsfoot trefoil, timothy, bromegrass, orchardgrass, or red, ladino, or alsike clover are suitable for pasture seeding or renovation. Information on the management of wooded areas or the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

The soils in this unit are suited to hayland cropping. Forage crops such as alfalfa and bromegrass can be grown using corn or soybeans and small grain as needed to reestablish hayland. Elimination of the row crop when reestablishing meadow will help improve tilth. If higher profit row crops are needed, conservation practices such as contour tillage or contour stripcropping are effective for controlling runoff and erosion. If these soils need additional drainage, the slow permeability limits the use of tile. Engineering assistance will be needed to design and install special drainage systems.

Capability Unit Vw-1. The soils in this unit are Houghton (W103), Otter (W76), Radford (W74), and Sawmill (W107).

This unit consists of dark-colored soils. They lie on nearly level to depressional bottomland areas. They are deep and primarily poorly drained. The surfaces and subsurfaces are muck or are mineral material of medium or moderately fine textures.

These soils have moderate permeability; Houghton muck exhibits somewhat more variability in this property than the other soils. Available water capacity is very high for all the soils in the group. The soils are inherently productive and have very high organic matter content. Wetness and frequent overflow, usually impractical to correct by drainage, are permanent limitations of these soils.

These soils are used mostly for permanent pasture in late summer and fall. Some areas remain as a habitat for water-loving wildlife. Because of the wetness and overflow limitations, cultivation of the common crops is not feasible.

In most areas pastures can be improved, and benefits from proper management can be expected. These soils are mostly neutral in reaction and provide natural high levels of calcium to legumes. Legumes and grasses such as alsike or ladino clover, birdsfoot trefoil, timothy, and reed canarygrass are suitable for pasture seeding or renovation. Information about the management of wooded areas is given in the section, "Use and Management of Soils for Woodland"; information concerning managing the soils for wildlife is given in the section, "General Management of Soils for Wildlife."

Capability Unit VIe-1. The soils in this unit are Derinda (417D3, 417E2), Dodgeville (40E2), and Dubuque and Dunbarton, undifferentiated (973D3, 973E2).

This unit consists of moderately dark- and light-colored eroded soils. They occupy strongly sloping to very strongly sloping upland positions. They are moderately well and well drained. The surface soils have medium to moderately fine texture and the subsoil textures are moderately fine or fine.

The soils in this unit have moderately slow or slow permeability and moderate to low available water capacity. These soils have favorable natural fertility but are shallow to moderately deep to limestone or material high in clay content. Because of this limited depth, crop yields will commonly be reduced. The organic matter content ranges from medium to low. The soils in this unit are subject to very severe surface runoff and erosion if cultivated. They have limestone or shale in the root zone, causing drouthiness to be a secondary limitation.

These soils are used mostly for growing hay and pasture. They are not suited for cultivated crops because the erosion hazard is very severe and the shallow rooting zone restricts the amount of available water.

Permanent cover is necessary for effective erosion control. Legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suited for pasture planting or renovation. Periodic additions of limestone, based on soil tests, will be needed for best pasture yields on these soils. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

Capability Unit VIs-1. The soils in this unit are Casco-Fox complex (972E2) and Rodman-Casco complex (969D2, 969E2).

This unit consists of light- or moderately dark-colored eroded soils. They occupy strongly sloping to steep gravelly terrace or upland positions. They are well to excessively drained. The surface soils are medium to moderately coarse textured. Where subsoils lie below the surface layer, they are moderately fine textured. Some areas are very shallow to calcareous sand and gravel with no subsoil.

These soils have moderate to very rapid permeability and moderate to very low available water capacity. The soils in this unit have coarse-textured material in the root zone, causing drouthiness and shallow rooting to be the outstanding limitations. Because of these limitations, yields of most crops cannot be expected to be high. Erosion is a secondary hazard. The organic matter content is low to moderately low.

These soils are used mostly for bluegrass pasture and hay. They are not suited for cultivated crops because they are shallow, drouthy, and subject to erosion, and some areas are too steep to farm. Permanent cover is necessary for effective soil and water retention. Legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suitable for pasture seeding or renovation. Legumes are heavy feeders of calcium, which is naturally available throughout the root zone of these soils. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

Capability Unit VIIs-1. The soils in this unit are Dubuque and Dunbarton, undifferentiated (973E3, 973-F2) and Sogn (504D2, 504F2).

This unit consists of light- and moderately dark-colored soils. They occupy strongly sloping to steep limestone bedrock uplands. Some areas of Sogn soils designated as 504F2 have slopes ranging up to 50 percent. They are well drained to somewhat excessively drained. The surface soils are medium to moderately fine textured. Where subsoils lie below the surface layer or outcrop at the surface, they are moderately fine or fine textured. Some areas are very shallow to bedrock and no subsoil exists.

These soils have moderate to slow permeability and very low to moderate available water capacity. The soils in this unit have bedrock or high-clay material in the root zone, causing drouthiness or shallow rooting, or both, to be the outstanding limitations. Erosion is also a hazard on these soils. The organic matter content is low to moderately low. Because of these limitations, good yields of most crops cannot be expected.

These soils are used mainly for growing bluegrass pasture and timber. They are not suited to cultivated crops because they are drouthy, most have very shallow rooting zones, all are subject to erosion, and some are too steep to farm. Permanent cover is necessary for effective soil and water retention. Where these soils are used for permanent pasture, legumes and grasses such as alfalfa, red clover, birdsfoot trefoil, bromegrass, timothy, or orchardgrass are suitable for pasture planting or renovation. Although calcium is naturally available throughout the root zone of the Sogn soils, the other soils in this unit will require periodic additions of limestone, based on test results, for best pasture yields. Information on the management of wooded areas and the kinds of trees to plant is given in the section, "Use and Management of Soils for Woodland."

Crop Yields and Productivity

Average crop yields under a *high level of management* are given in Table 4 for each mapping unit for crops well adapted for the respective units. A high level of management is defined briefly here. The reader who is interested in more detailed information should consult Illinois Extension Circular 1016, "Productivity of Illinois Soils" (*20*).

The high level of management is based on production input levels thought to be required for maximum profit. This level is based on most recent technology used by about 10 percent of farm operators.

The management inputs include drainage improvement consistent with soil properties and economic considerations. Soil reaction is maintained at pH levels of 6.0 to 6.5. Available phosphorus (P-1) test levels are maintained at 40 to 50 pounds per acre, and available potassium test levels are maintained at a minimum of 240 pounds per acre. Nitrogen application rates are 125 to 175 pounds per acre per year for corn. Corn plant populations are 24,000 to 20,000 plants per acre, adjusted downward for soils with low water-supplying capacities. Erosion control practices are used as needed to insure the soil will not be seriously damaged. Weed and insect control are timely and adequate. Tillage operations are adequate for the soil and the crop but are not excessive.

The yields for a high level of management are based on recent yields obtained at high-input levels at agronomy research centers and research fields in Illinois. The yields shown for Stephenson County in Table 4 are based on yields in Circular 1016 (*20*), using adjustment percentages for different slope and erosion classes.

Use and Management of Soils for Woodland[1]

Most of the forest has been cleared since pioneer settlement began. According to the Illinois Soil and Water Conservation Needs Inventory published in 1970, Stephenson County had 11,600 acres in forest in 1967. This makes up about 3 percent of the land area.

Because most trees were cleared from soils suitable for crops, the remaining trees are mainly on soils that are unsuitable for cultivation. These soils are mostly steep, shallow to bedrock, or both. The main species are white oak, red oak, black oak, hickory, and maple.

In Table 5 the soils of Stephenson County are placed in 12 woodland suitability groups (*19*). Each group consists of soils that are capable of producing similar kinds of wood crops, that need similar management to produce these crops when the vegetation is similar, and that have about the same potential productivity.

The potential productivity of a soil for a given species is commonly expressed as site index. It is the

[1] This section was prepared with the assistance of William Clark, Woodland Conservationist, Soil Conservation Service.

TABLE 4. — ESTIMATED AVERAGE ACRE YIELDS OF PRINCIPAL CROPS UNDER A HIGH LEVEL OF MANAGEMENT AND ESTIMATED ACREAGES OF MAPPING UNITS AND SOIL SERIES

Soil series	Map symbol	Corn (bu.)	Soybeans (bu.)	Oats (bu.)	Alfalfa hay (tons)	Mixed pasture (days)[a]	Acreage[b]	
							Mapping unit	Soil series
Pecatonica	21B	97	30	56	4.0	200	158	
	21C	95	30	55	3.9	195	862	
	21C2	86	27	50	3.6	180	1,467	
	21D2	82	26	47	3.4	170	735	3,222
Westville	22C2	79	25	50	3.7	175	181	
	22D2	76	24	47	3.4	165	216	
	22D3	71	23	44	3.3	155	252	
	22E2	73	23	45	3.3	160	102	751
Miami	27C2	87	31	50	3.7	180	1,065	
	27D2	83	30	48	3.5	170	1,062	
	27D3	78	28	45	3.3	160	200	
	27E2	79	28	46	3.3	160	177	2,504
Dubuque	29C	65	21	44	2.8	145	498	
	29C2	52	17	36	2.2	115	1,745	
	29D	63	20	43	2.7	140	627	
	29D2	48	16	34	2.1	110	7,532	10,402
Tama	36A	137	42	82	5.5	275	3,647	
	36B	135	41	81	5.4	270	31,314	
	36C	132	40	79	5.3	265	9,207	
	36C2	119	37	71	4.8	240	4,717	
	36D2	114	35	68	4.6	230	541	49,426
Dodgeville	40C	77	31	56	3.5	175	1,196	
	40C2	62	25	45	2.8	140	1,490	
	40D2	58	23	42	2.6	130	10,486	
	40E2	55	22	40	2.6	125	447	13,619
Muscatine	41A	145	46	86	5.6	280	6,861	
	41B	142	45	84	5.5	275	1,622	8,483
Atterberry	61A	130	40	77	5.1	255	1,915	
	61B	127	39	75	5.0	250	644	2,559
Harpster	67	118	40	67	4.5	225	295	295
Sable	68	136	46	77	5.1	255	3,203	3,203
Radford[c]	74	125	41	67	4.9	245	17,642	
	W74	N	N	N	N	240	71	17,713
Otter[c]	76	120	40	60	4.2	210	722	
	W76	N	N	N	N	200	29	751
Huntsville[c]	77	128	43	75	5.2	260	2,833	2,833
Millington[c]	82	113	36	61	4.2	210	147	147
Dickinson	87B	82	29	56	3.4	170	148	
	87C2	73	26	50	3.0	150	92	240
Houghton	103	112	40	N	N	200	165	
	W103	N	N	N	N	190	30	195
Virgil	104A	129	41	76	5.1	255	2,630	
	104B	126	40	74	5.0	250	898	3,528
Batavia	105A	120	39	74	4.9	245	829	
	105B	118	38	73	4.8	240	2,916	
	105C	115	37	71	4.7	235	900	4,645
Sawmill[c]	107	125	41	67	4.9	245	4,896	
	W107	N	N	N	N	235	188	5,084
Camden	134B	104	34	63	4.4	220	1,119	
	134C	102	34	61	4.3	215	799	
	134C2	92	30	56	3.9	195	1,874	
	134D2	88	29	53	3.7	185	1,958	
	134D3	83	27	50	3.5	175	82	
	134E2	84	28	51	3.6	180	435	6,267

(Footnotes given on page 75.)

TABLE 4 (continued).

Soil series	Map symbol	Corn (bu.)	Soybeans (bu.)	Oats (bu.)	Alfalfa hay (tons)	Mixed pasture (days)[a]	Acreage[b] Mapping unit	Acreage[b] Soil series
Proctor	148A	125	40	80	5.0	250	311	
	148B	123	39	78	4.9	245	948	
	148C	120	38	77	4.8	240	362	
	148C2	109	35	70	4.4	220	1,316	
	148D2	104	33	66	4.2	210	249	3,186
Drummer	152	134	46	75	5.0	250	1,368	1,368
Catlin	171B	125	40	77	5.2	260	1,199	
	171C	123	39	76	5.1	255	1,370	
	171C2	111	36	69	4.6	230	649	
	171D2	106	34	66	4.4	220	227	3,445
Morley	194C	83	30	54	3.6	175	129	
	194C2	74	26	46	3.1	150	244	
	194D2	69	25	44	2.9	140	679	
	194E2	65	23	41	2.7	130	187	1,239
Elburn	198A	140	44	85	5.5	275	1,983	
	198B	137	43	83	5.4	270	442	2,425
Plano	199A	131	41	82	5.3	265	1,709	
	199B	128	40	80	5.2	260	6,412	
	199C	126	39	79	5.1	255	1,387	
	199C2	114	36	71	4.6	230	2,039	11,547
Thorp	206	110	38	63	4.2	210	804	804
Lena	210	109	37	N	N	180	163	163
Millbrook	219	125	39	74	4.9	245	465	465
Parr	221B	105	37	68	4.5	225	133	
	221C	103	36	66	4.4	220	176	
	221C2	93	33	60	4.0	200	314	
	221D2	89	32	57	3.8	195	432	1,055
Varna	223C	98	35	62	4.0	205	395	
	223C2	79	28	50	3.2	160	401	
	223D2	74	26	47	3.1	155	913	1,709
Argyle	227B	100	33	61	4.1	205	173	
	227C	96	32	60	4.0	200	1,052	
	227C2	87	30	54	3.7	185	1,052	
	227D2	83	28	51	3.5	175	701	2,978
Birkbeck	233B	105	36	63	4.4	220	126	
	233C2	93	32	56	3.9	195	495	
	233D2	89	31	53	3.7	185	128	749
Dorchester[c]	239	112	37	66	4.7	235	6,799	6,799
Kendall	242A	117	37	68	4.7	235	750	
	242B	115	36	67	4.6	230	324	1,074
St. Charles	243A	110	35	66	4.5	225	316	
	243B	108	34	65	4.4	220	1,359	
	243C	106	33	63	4.3	215	738	
	243C2	96	30	57	3.9	195	597	3,010
Edgington	272	106	38	62	4.1	205	220	220
Stronghurst	278	120	38	69	4.8	240	266	266
Rozetta	279A	114	36	66	4.6	230	541	
	279B	112	35	65	4.5	225	4,952	5,493
Fayette	280B	110	34	65	4.5	225	8,347	
	280C	108	33	63	4.4	220	7,375	
	280C2	97	30	57	4.0	200	9,766	
	280D	104	32	61	4.3	215	287	
	280D2	93	29	55	3.8	195	1,609	
	280D3	87	27	51	3.6	180	202	
	280E2	88	28	52	3.6	185	225	27,811

TABLE 4 (continued).

Soil series	Map symbol	Corn (bu.)	Soybeans (bu.)	Oats (bu.)	Alfalfa hay (tons)	Mixed pasture (days)[a]	Acreage[b]	
							Mapping unit	Soil series
Warsaw	290C2	77	28	52	3.2	160	605	
	290D2	73	26	49	3.1	155	142	747
Harvard	344A	115	37	71	4.7	235	155	
	344B	113	36	70	4.6	230	855	
	344C	110	35	68	4.5	225	223	
	344C2	100	32	62	4.1	205	539	
	344D2	95	31	59	3.9	195	192	1,964
Kidder	361D2	68	26	48	3.0	150	476	
	361D3	64	24	45	2.8	140	337	813
Griswold	363D2	78	30	55	3.5	175	837	837
Downs	386A	124	39	75	5.1	255	603	
	386B	122	38	73	5.0	250	14,254	
	386C	119	37	72	4.9	245	6,943	
	386C2	108	34	65	4.4	220	3,463	
	386D2	103	33	62	4.2	210	831	26,094
Woodbine	410B	76	26	44	3.2	160	1,169	
	410C	74	25	43	3.1	155	2,530	
	410C2	68	23	39	2.9	140	3,522	
	410D	72	24	42	3.0	150	211	
	410D2	65	22	37	2.7	135	1,981	
	410D3	61	21	35	2.6	125	185	
	410E2	62	20	36	2.6	130	169	9,767
Ashdale	411B	95	34	63	4.2	210	2,057	
	411C	93	33	61	4.1	205	2,653	
	411C2	84	30	56	3.7	190	2,429	
	411D2	81	29	53	3.6	180	1,208	8,347
Ogle	412B	106	36	71	4.3	215	5,879	
	412C	104	35	69	4.2	210	4,813	
	412C2	94	31	63	3.8	190	2,378	
	412D2	90	30	60	3.7	185	190	13,260
Myrtle	414B	102	35	63	4.1	205	2,236	
	414C	100	35	61	4.0	205	2,959	
	414C2	90	31	56	3.7	185	639	
	414D2	86	30	53	3.5	175	300	6,134
Orion[c]	415	113	37	63	4.2	210	1,392	1,392
Durand	416B	106	37	66	4.4	220	178	
	416C	104	36	64	4.3	215	639	
	416C2	94	33	58	3.9	195	1,390	
	416D2	90	32	56	3.7	190	498	2,705
Derinda	417C2	53	19	35	2.2	110	448	
	417D2	50	18	33	2.0	105	621	
	417D3	47	17	31	1.9	95	142	
	417E2	48	17	31	1.9	100	862	2,073
Schapville	418C2	59	22	38	2.5	125	130	
	418D2	55	21	36	2.4	120	431	561
Flagg	419B	98	32	57	3.9	195	1,734	
	419C	96	32	56	3.8	190	2,155	
	419C2	87	29	50	3.5	175	1,050	
	419D2	83	27	48	3.3	165	252	5,191
Palsgrove	429B	87	31	54	3.8	190	381	
	429C	85	31	53	3.7	185	2,488	
	429C2	77	28	48	3.4	170	1,962	
	429D	83	30	51	3.6	180	410	
	429D2	74	27	46	3.2	160	2,548	7,789
Lawson[c]	451	130	42	73	5.1	255	15,475	15,475
Sogn	504D2	N	N	30	2.0	90	2,176	
	504F2	N	N	N	1.0	55	1,960	4,136

TABLE 4 (continued).

Soil series	Map symbol	Corn (bu.)	Soybeans (bu.)	Oats (bu.)	Alfalfa hay (tons)	Mixed pasture (days)[a]	Acreage[b] Mapping unit	Soil series
Hitt	506B	87	34	56	3.8	190	2,613	
	506C	85	33	55	3.7	185	3,863	
	506C2	77	30	50	3.4	170	5,400	
	506D2	74	29	47	3.2	160	1,583	13,459
Keltner	546B	89	32	52	3.8	190	230	
	546C	87	31	51	3.7	185	636	
	546C2	79	29	46	3.4	170	285	
	546D2	76	27	44	3.2	160	222	1,373
Eleroy	547B	82	28	47	3.5	175	203	
	547C	81	27	46	3.4	170	344	
	547C2	73	25	42	3.1	155	626	
	547D2	70	24	40	3.0	150	1,421	2,594
Loran	572B	93	34	54	3.9	195	169	
	572C	91	33	53	3.8	190	199	368
Dorchester, cobbly subsoil variant[c]	578	105	36	64	4.2	210	555	555
Octagon	656C2	90	32	57	3.8	190	458	
	656D2	86	27	54	3.7	185	539	997
Nasset	731B	89	32	57	3.8	190	543	
	731C	87	31	56	3.7	185	1,814	
	731C2	79	29	50	3.4	170	1,057	
	731D2	76	27	48	3.2	160	652	4,066
Ridott	743B	83	32	52	3.7	185	237	
	743C	82	31	51	3.6	180	321	558
Shullsburg	745B	80	32	50	3.4	170	236	
	745C	79	31	49	3.3	160	277	
	745C2	63	25	39	2.6	130	325	
	745D2	53	23	37	2.5	125	208	1,046
Calamine	746B	86	33	53	3.5	175	62	62
Oneco	752C	81	31	50	3.6	180	2,488	
	752C2	73	28	45	3.2	160	1,546	
	752D2	70	27	43	3.1	155	1,024	5,058
Massbach	753B	79	31	50	3.5	175	257	
	753C	78	30	49	3.4	170	600	
	753C2	70	28	44	3.1	155	445	
	753D2	67	27	42	3.0	150	557	1,859
Rodman–Casco complex	969D2	32	12	33	2.4	120	269	
	969E2	31	11	32	2.3	115	209	478
Keller–Coatsburg complex	970C2	63	22	41	2.8	140	721	
	970D2	58	21	39	2.6	130	303	1,024
Fishhook–Atlas complex	971C2	N	N	27	2.0	105	592	
	971D2	N	N	26	1.9	95	502	1,094
Casco–Fox complex	972C2	64	21	40	2.7	135	249	
	972D2	60	20	38	2.5	125	365	
	972E2	N	N	35	2.3	115	96	710
Dubuque and Dunbarton	973D3	46	15	31	2.0	100	2,069	
	973E2	47	15	32	2.0	100	3,449	
	973E3	44	14	29	1.9	95	476	
	973F2	40	13	28	1.8	90	1,417	7,411
	Made land or borrow pits						242	242
	Gravel pits						227	227
	Limestone quarries						300	300
	Water						1,081	1,081
						TOTAL	363,520	363,520

N = crop not adapted or not commonly grown.
[a] Animal-unit days, which expresses the carrying capacity of pasture. It is the number of days 1 acre can carry one animal during a single grazing season without injury to the sod. One animal unit equals 1 cow, 2 yearling calves, 1 horse, 5 sheep, or 4 brood sows.
[b] Mapping unit acres furnished mainly by Stephenson County Tax Assessor's Office.
[c] Crop yields given for these bottomland soils assume there is no damage from flooding.

TABLE 4A. — DISTRIBUTION OF SOILS BY SLOPE RANGE[a] AND DEGREE OF EROSION IN ACRES

	A 0–2%	B 2–4%	C 4–7%	D 7–12%	E 12–18%	F 18–30%	Total
None to slight	79,978	96,527	62,391	1,535	0	0	240,431
Moderate	0	0	59,763	47,796	6,358	3,377	117,294
Severe	0	0	0	3,469	476	0	3,945
Total	79,978	96,527	122,154	52,800	6,834	3,377	361,670

[a] Seven mapping units have slope ranges broader than normal for the letter symbol used, as discussed in text.

height in feet that the dominant trees of a given species, growing on a specified soil, will reach at a specified age. The site index for cottonwood is based on height at 30 years of age (*2*); for other species, it is based on height at 50 years of age.

The estimated average annual growth per acre is given in board feet measured by the Doyle Rule. The estimates are based on data from well-stocked, well-managed stands of upland oaks, pin oak, yellow poplar, and cottonwood (*22, 23*). Red oak and white oak were used to estimate the rate of growth for all upland oaks.

Five limitations that affect the growth or management of trees are rated in Table 5.

Erosion hazard refers to the risk of erosion in properly managed stands. The length and steepness of slopes, soil textures, and permeability are among the factors considered. *Slight* means that erosion is not a major problem. *Moderate* indicates that management is needed to prevent erosion during harvesting operations and in cleared areas. *Severe* indicates that intensive management is required to control erosion.

Equipment limitation refers to soil characteristics and topographic features that restrict the use of equipment in planting, tending, or harvesting trees. *Slight* means that there is little or no restriction on the type of equipment or time of year that it can be used. *Moderate* means that use of equipment is restricted because of steep slopes or because soils are wet for three months or less each year. *Severe* indicates that the very steep slopes make special harvesting methods necessary or that use of equipment is restricted because the soils are wet for more than three months each year.

Seedling mortality refers to the expected loss of natural or planted tree seedlings as influenced by kinds of soil or topographic features. Losses caused by plant competition are excluded. It is assumed that the natural supply of seed is adequate, stock is good, seedlings are properly planted and cared for, and climatic conditions are normal. *Slight* means that losses normally are not more than 25 percent of the planted or natural stock; *moderate* indicates that losses are between 25 and 50 percent; and *severe* indicates that more than half of the planted or natural stock is likely to die.

Plant competition refers to the rate at which unwanted trees, shrubs, and weeds are likely to invade a given site where openings are made in the canopy. *Slight* means that competition is not a major problem. *Moderate* means that plant competition develops but does not prevent the establishment of desirable species and can be controlled easily. *Severe* indicates that stands of desired species are not restocked naturally and that planted trees may be choked out unless intensive management is applied to eliminate competing plants.

Windthrow hazard is an evaluation of the soil characteristics that control tree root development and, therefore, affect tree wind firmness. All soils are rated slight, which indicates no special problems are recognized.

Table 5 lists, for each woodland suitability group, tree species to favor in natural stands. The ratings are based on the suitability of the species for the site and the market value of the trees. Species are not listed in order of preference. Species suitable for planting are given for each group. On those soils where aspect is a factor, adapted species are listed for north-east and south-west exposures. On soils where windbreaks are considered beneficial, some adapted tree and shrub species for this use are also listed.

General Management of Soils for Wildlife[1]

Wildlife in Stephenson County can be classified into three major groups: openland, woodland, and wetland. Soils in the county have potential for habitat development for all three kinds of wildlife.

In Table 6 the soils are placed in six groups and rated according to their suitability for elements of wildlife habitat and for kinds of wildlife. The ratings are good, fair, poor, and very poor. A rating of *good* means that habitats are easily established, improved, or maintained. A rating of *fair* indicates that the soils have moderate limitations for establishing and maintaining habitats. A *poor* rating means that the soils have severe limitations for establishing and maintaining habitats; habitat management may be difficult and expensive. A *very poor* rating means it is generally impractical to establish and maintain wildlife habitats on these soils.

The six elements of wildlife habitat and the three kinds of wildlife shown in Table 6 are defined in the following paragraphs.

[1] This section was prepared with the assistance of Rex Hamilton, Biologist, Soil Conservation Service.

Grain and seed crops. These are domestic grains or seed-producing annual plants, including such crops as corn, sorghum, wheat, oats, soybeans, buckwheat, and sunflowers.

Grasses and legumes. These are domestic perennial grasses and legumes, including such crops as brome, fescue, timothy, redtop, orchardgrass, reed canarygrass, clovers, trefoil, alfalfa, and sericea.

Wild herbaceous plants. These are native or introduced perennial grasses and forbs that provide food and cover principally for upland wildlife. These plants include bluestem, indiangrass, wheatgrasses, wild rye, oatgrasses, pokeweed, strawberries, lespedezas, tick clovers, wild beans, jewelweed, and ragweed.

Hardwood plants. These are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, twigs (browse), or foliage used extensively as food by wildlife. These plants, commonly established by natural processes but also planted, include oak, cherry, hawthorns, dogwoods, viburnums, hazel, maple, birch, ash, grapes, sumac, briers, greenbriers, and roses.

Wetland plants. These are annual and perennial wild herbaceous plants, excluding submerged or floating aquatic plants, that grow on moist or wet sites. These plants are used mainly by wetland wildlife for food and cover and include smartweeds, wild millets, rushes, sedges, reeds, rice cutgrass, mannagrass, bluejoint, cord grasses, cattails, pondweeds, wild celery, and spatterdocks.

Shallow water developments. These are impoundments or excavations generally not more than 5 feet deep. Examples are low dikes and levees, shallow dugouts, level ditches, and devices for controlling the water level on marshy streams or channels.

Soils are not rated for impounded farm ponds in Table 6. However, this type of pond attracts migratory waterfowl and can be used for freshwater fish. Features affecting the use of soils for impounded farm ponds are given in Table 9, "Interpretations of Engineering Properties of Soils."

Openland wildlife. Included are quail, mourning dove, meadowlark, cottontail rabbit, red fox, and other birds and mammals that normally live on cropland, pastures, hayland, and other areas overgrown with grasses, forbs, and shrubs. Wildlife habitat elements used to rate the soils for this kind of wildlife are grain and seed crops, grasses and legumes, wild herbaceous plants, and hardwood plants.

Woodland wildlife. Included are squirrels, white-tailed deer, raccoon, chipmunks, woodpeckers, nuthatches, and other birds and mammals that frequent wooded areas of hardwood trees and shrubs. Wildlife habitat elements used to rate the soils for this kind of wildlife are grasses and legumes, wild herbaceous plants, and hardwood plants.

Wetland wildlife. Included are various kinds of waterfowl, muskrat, mink, kingfishers, red-winged blackbirds, and other birds and mammals that normally live in wet areas such as ponds, marshes, and swamps. Wildlife habitat elements used to rate the soils for this kind of wildlife are wetland plants and shallow water developments.

Recreational Uses of the Soils

In Table 7 the soils of Stephenson County are placed in seven recreation groups and rated slight, moderate, or severe, according to their limitations for recreational uses. The ratings are based on soil characteristics that affect use such as natural drainage, seasonal high water table, flooding hazard, permeability, slope, texture of the surface layer, and stoniness or rockiness.

A rating of *slight* means that the soil has few or no limitations for the use specified or that the limitations can be easily overcome. *Moderate* indicates that the limitations can be overcome by careful planning and maintenance. *Severe* indicates that the soil is poorly suited to the use specified or that the limitations can only be overcome by intensive engineering practices that require a large investment. The soil properties determining moderate and severe limitations are mentioned with the ratings in Table 7. The recreational uses given in the table are discussed in the following paragraphs.

Cottages and utility buildings. These buildings include cottages, washrooms and bathrooms, picnic shelters, and service buildings that are used seasonally or all year. The ratings are based mainly on soil features that contribute to the adequate support of these buildings. Additional information on soil limitations for septic tank filter fields is given in Table 9 (pages 92-119).

Campsites. These are areas suitable for tents and trailers and for living outdoors for a week or more. Little site preparation should be required. The soils are rated according to their limitations for unsurfaced parking areas for cars and camp trailers and for heavy traffic by people, horses, and small vehicles such as bicycles.

Picnic areas. Soils used for picnic areas need to support intensive foot traffic. Features that affect the desirability of a site, such as trees or ponds, are not considered in the ratings.

Playgrounds. These areas are developed for intensive play and for organized games such as baseball, football, and tennis. They are subject to intensive foot traffic.

Paths and trails. Soils used for paths and trails need to support intensive traffic of people on foot or on horseback. Little preparation should be needed. Paths and trails on sloping soils should be contoured to control erosion.

TABLE 5. — WOODLAND SUITABILITY OF SOILS

Woodland suitability groups	Potential productivity			Management limitations					Species suitability[c]						
										To plant					
										On cool sites—facing north and east		On hot sites—facing south and west		For windbreaks	
	Species	Site index[a]	Annual growth[b] per acre	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Windthrow hazard	To favor in existing stands	None to mod. erosion	Severe erosion	None to mod. erosion	Severe erosion	Trees	Shrubs
Group 1o1. Well- and moderately well-drained, nearly level to strongly sloping soils on uplands and terraces. They have silt loam surface layers and silty clay loam or clay loam subsoils. The soils are moderately permeable and have high to very high available water capacity.	Upland oaks[d] Yellow poplar	85+ 95+	350–450 550–650	Slight	Slight	Slight	Slight to moderate	Slight	Yellow poplar, white oak, red oak, green ash	White oak, black walnut, red oak, ash, white pine, red pine, sugar maple		Red pine, black walnut, ash		White pine, red pine, Norway spruce, white spruce, Douglas fir	Forsythia, silky dogwood, autumn olive, amur maple, gray dogwood, Russian olive, amur honeysuckle, spirea, American cranberry bush, lilac
Group 1o4. Well- and moderately well-drained, nearly level soils on bottomlands. They have silt loam surface horizons and silt loam or cobbly substrata. The soils are moderately permeable and have very high available water capacity.	Cottonwood Yellow poplar	105+ 95+	550–650 550–650	Slight	Slight	Slight	Moderate	Slight	Cottonwood, sycamore, yellow poplar, ash, swamp white oak, black walnut	Black walnut, sycamore, cottonwood, red maple, sugar maple, ash, hackberry				White pine, red pine, Norway spruce, white spruce, Douglas fir	Forsythia, amur maple, gray dogwood, silky dogwood, autumn olive, Russian olive, amur honeysuckle, spirea, American cranberry bush, lilac
Group 2o1. Well- to somewhat poorly drained, nearly level to strongly sloping soils on uplands and terraces. They have silt loam or loam surface layers and silty clay loam, clay loam, silty clay, or sandy clay loam subsoils. The soils are moderately to moderately slowly permeable and have moderate to very high available water capacity.	Yellow poplar Upland oaks[d]	85–95 75–85	450–550 250–350	Slight	Slight	Slight	Slight to severe	Slight	White oak, red oak, yellow poplar, black walnut	White oak, black walnut, red oak, ash, white pine, red pine, sugar maple	Red pine, scotch pine, black locust	Red pine, black walnut, ash	Red pine, scotch pine, red cedar, black locust	White pine, red pine, Norway spruce, white spruce, Douglas fir	Forsythia, silky dogwood, autumn olive, amur maple, gray dogwood, Russian olive, amur honeysuckle, spirea, American cranberry bush, lilac
Group 2o4. Somewhat poorly drained, nearly level soils on bottomlands. They have silt loam surface layers and silt loam or silty clay loam substrata. The soils are moderately permeable and have high to very high available water capacity.	Cottonwood Yellow poplar Pin oak	95–105 85–95 85–95	450–550 450–550 350–450	Slight	Slight	Slight	Severe	Slight	Cottonwood, sycamore, yellow poplar, pin oak	Cottonwood, pin oak, sycamore, red maple, swamp white oak, ash				White pine, red pine, Norway spruce, white spruce, Douglas fir, arborvitae	Silky dogwood, amur maple, American cranberry bush, forsythia
Group 2r2. Most of the soils are well or moderately well drained and occur on very strongly sloping upland and terrace areas. They have silt loam surface layers and silty clay loam, clay loam, silty clay, or sandy clay loam subsoils. The soils are primarily moderately permeable and have high to very high available water capacity.	Yellow poplar Upland oaks[d]	85–95 75–85	450–550 250–350	Moderate	Moderate	Slight to moderate	Moderate	Slight	White oak, red oak, black locust	White oak, black walnut, red oak, ash, white pine, red pine, sugar maple	Red pine, scotch pine, black locust	Red pine, black walnut, ash	Red pine, scotch pine, red cedar, black walnut	White pine, red pine, Norway spruce, white spruce, Douglas fir	Forsythia, silky dogwood, autumn olive, amur maple, gray dogwood, Russian olive, amur honeysuckle, spirea, American cranberry bush, lilac
Group 2w3. Poorly drained, nearly level soils on uplands and terraces. They have silty clay loam surface layers and silty clay loam subsoils. The soils are moderately permeable and have high to very high available water capacity.	Pin oak	85–95	350–450	Slight	Moderate	Severe	Severe	Slight	Pin oak, silver maple, cottonwood, sycamore	Cottonwood, pin oak, sycamore, red maple, swamp white oak, ash				Arborvitae	Silky dogwood, amur maple, American cranberry bush, forsythia
Group 2w5. Very poorly to somewhat poorly drained, nearly level soils on bottomlands. The surface layers and substrata are silt loam, silty clay loam, loam, or muck. The soils have moderately slow to moderate permeability and high to very high available water capacity. The soils are subject to flooding.	Pin oak Cottonwood	85–95 95–105	350–450 450–550	Slight	Moderate	Moderate	Severe	Slight	Pin oak, cottonwood, sycamore	Cottonwood, pin oak, sycamore, red maple, swamp white oak, ash				Arborvitae	Silky dogwood, amur maple, American cranberry bush, forsythia

Group 3o1. Somewhat poorly to well-drained, nearly level to strongly sloping soils on uplands and terraces except Coatsburg has poor drainage. They have silt loam or loam surface layers and silty clay loam, clay loam, sandy loam, sandy clay loam, silty clay, or clay subsoils. The soils are very slowly to moderately permeable and have moderate to very high available water capacity.	Upland oaks[d]	65–75	150–250	Slight	Slight	Slight	Slight	Slight	White oak, red oak, ash, bur oak	White pine, scotch pine, red cedar, red pine	White pine, scotch pine, red cedar, black locust, red pine	White pine, red pine	Scotch pine, black locust, jack pine, red pine, red cedar, osage orange	White pine, Norway spruce, Douglas fir, red pine, arborvitae, white spruce	Silky dogwood, gray dogwood, autumn olive, amur maple, Russian olive, spirea
Group 3r2. The soils are moderately well or well drained, are very strongly sloping to steep, and occur on uplands. The soils have silt loam surface layers and silty clay loam, silty clay, or clay subsoils. The soils are very slowly to moderately permeable and have low to moderate available water capacity.	Upland oaks[d]	65–75	150–250	Moderate	Moderate	Moderate	Slight	Slight	White oak, red oak, white ash, bur oak	White pine, scotch pine, red cedar, red pine	White pine, scotch pine, red cedar, black locust, red pine	White pine, red pine	Scotch pine, black locust, jack pine, red pine, red cedar, osage orange	White pine, Norway spruce, Douglas fir, red pine, arborvitae, white spruce	Silky dogwood, gray dogwood, autumn olive, amur maple, Russian olive, spirea
Group 3s2. Well- to somewhat excessively drained, gently sloping to moderately sloping soils on terraces. They have sandy loam su face horizons and sandy loam subsoils. They are moderately rapidly to rapidly permeable and have low available water capacity. Soil blowing is a hazard.	Upland oaks[d]	65–75	150–250	Slight to moderate	Slight to severe	Moderate to severe	Slight to severe	Slight	Black oak, white oak	White pine, scotch pine, red cedar, red pine	White pine, scotch pine, red cedar, black locust, red pine	White pine, red pine	Scotch pine, black locust, jack pine, red pine, red cedar, osage orange	White pine, Norway spruce, Douglas fir, red pine, arborvitae, white spruce	Silky dogwood, gray dogwood, autumn olive, amur maple, Russian olive, spirea
Group 3s3. Well- to excessively drained, moderately sloping to steep soils on uplands and terraces. They have gravelly loam or silt loam surface horizons and bedrock, gravel, sand, or clay loam subsoils or substrata. They are moderately to very rapidly permeable and have very low to moderate available water capacity.	Upland oaks[d]	65–75	150–250	Moderate	Moderate to severe	Severe	Slight	Slight	Black oak, white oak	White pine, scotch pine, red cedar, red pine	White pine, scotch pine, red cedar, black locust, red pine	White pine, red pine	Scotch pine, black locust, jack pine, red pine, red cedar, osage orange	White pine, Norway spruce, Douglas fir, red pine, arborvitae, white spruce	Silky dogwood, gray dogwood, autumn olive, amur maple, Russian olive, spirea
Group 3w2. Poorly drained, nearly level to gently sloping soils on uplands and terraces. They have silt loam surface layers and clay loam or silty clay subsoils. The soils are moderately to very slowly permeable and have high available water capacity.	Pin oak	75–85	200–300	Slight	Moderate	Moderate	Severe	Slight	White oak, pin oak, ash, yellow poplar	Pin oak, ash, red maple				Arborvitae	Forsythia, gray dogwood, amur maple, American cranberry bush

Group 1o1 units: 36A, 36B, 36C, 36C2, 36D2 (Tama)[e]; 134B, 134C, 134C2, 134D2, 134D3 (Camden); 148A, 148B, 148C, 148C2, 148D2 (Proctor)[e]; 171B, 171C, 171C2, 171D2 (Catlin)[e]; 199A, 199B, 199C, 199C2 (Plano)[e]; 233B, 233C2, 233D2 (Birkbeck); 243A, 243B, 243C, 243C2 (St. Charles); 344A, 344B, 344C, 344C2, 344D2 (Harvard).

Group 1o4 units: 77 (Huntsville)[e]; 239 (Dorchester)[e]; 578 (Dorchester, cobbly subsoil variant)[e].

Group 2o1 units: 21B, 21C, 21C2, 21D2 (Pecatonica); 22C2, 22D2, 22D3 (Westville); 27C2, 27D2, 27D3 (Miami); 41A, 41B (Muscatine)[e]; 104A, 104B (Virgil); 105A, 105B, 105C (Batavia); 194C, 194C2, 194D2 (Morley); 198A, 198B (Elburn)[e]; 219 (Millbrook); 221B, 221C, 221C2, 221D2 (Parr)[e]; 223C, 223C2, 223D2 (Varna)[e]; 227B, 227C, 227C2, 227D2 (Argyle); 242A, 242B (Kendall); 279A, 279B (Rozetta); 280B, 280C, 280C2, 280D, 280D2, 280D3 (Fayette); 290C2, 290D2 (Warsaw)[e]; 386A, 386B, 386C, 386C2, 386D2 (Downs); 410B, 410C, 410C2, 410D, 410D2, 410D3 (Woodbine); 412B, 412C, 412C2, 412D2 (Ogle)[e]; 414B, 414C, 414C2, 414D2 (Myrtle); 416B, 416C, 416C2, 416D2 (Durand)[e]; 419B, 419C, 419C2, 419D2 (Flagg); 656C2, 656D2 (Octagon).

Group 2o4 units: 74 (Radford)[e]; 415 (Orion)[e]; 451 (Lawson)[e].

Group 2r2 units: 22E2 (Westville); 27E2 (Miami); 134E2 (Camden); 194E2 (Morley); 280E2 (Fayette); 410E2 (Woodbine).

Group 2w3 units: 67 (Harpster)[e]; 68 (Sable)[e]; 152 (Drummer)[e].

Group 2w5 units: W74 (Radford)[e]; 76, W76 (Otter)[e]; 82 (Millington)[e]; 103, W103 (Houghton)[e]; 107, W107 (Sawmill)[e]; 210 (Lena)[e].

Group 3o1 units: 29C, 29C2, 29D, 29D2 (Dubuque); 40C, 40C2, 40D2 (Dodgeville)[e]; 61A, 61B (Atterberry); 278 (Stronghurst); 361D2, 361D3 (Kidder); 363D2 (Griswold)[e]; 411B, 411C, 411C2, 411D2 (Ashdale)[e]; 417C2, 417D2, 417D3 (Derinda); 418C2, 418D2 (Schapville)[e]; 429B, 429C, 429C2, 429D, 429D2 (Palsgrove); 506B, 506C, 506C2, 506D2 (Hitt)[e]; 546B, 546C, 546C2, 546D2 (Keltner)[e]; 547B, 547C, 547C2, 547D2 (Eleroy); 572B, 572C (Loran)[e]; 731B, 731C, 731C2, 731D2 (Nasset); 743B, 743C (Ridott); 745B, 745C, 745C2, 745D2 (Shullsburg)[e]; 752C, 752C2, 752D2 (Oneco); 753B, 753C, 753C2, 753D2 (Massbach); 970C2, 970D2 (Keller-Coatsburg complex)[e]; 971C2, 971D2 (Fishhook-Atlas complex); 973D3 (Dubuque and Dunbarton, undifferentiated).

Group 3r2 units: 40E2 (Dodgeville)[e]; 417E2 (Derinda); 973E2, 973E3, 973F2 (Dubuque and Dunbarton, undifferentiated).

Group 3s2 units: 87B, 87C2 (Dickinson)[e].

Group 3s3 units: 504D2, 504F2 (Sogn); 969D2, 969E2 (Rodman-Casco complex); 972C2, 972D2, 972E2 (Casco-Fox complex).

Group 3w2 units: 206 (Thorp)[e]; 272 (Edgington)[e]; 746B (Calamine)[e].

[a] Determined according to method described in the narrative accompanying this table.

[b] Doyle rule (*23*).

[c] Absence of suggested species indicates column not applicable to the particular woodland suitability group; for those groups that are nearly level, and where slope aspect is not a factor, species suitable for planting are listed in the column for "Cool sites, none to mod. erosion."

[d] Upland oaks include white oak, black oak, red oak, and bur oak.

[e] No natural woodland on these soils, but they are adapted to species listed as suitable for planting.

TABLE 6. — SUITABILITY OF SOILS FOR WILDLIFE

Wildlife groups	Elements of wildlife habitat						Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood plants	Wetland plants	Shallow water developments	Openland wildlife	Woodland wildlife	Wetland wildlife
Group 1. Deep, well-drained and moderately well-drained, nearly level to strongly sloping soils on uplands and terraces.	Good for 0 to 7% slopes. Fair for 7 to 12% slopes. Poor for 7 to 12% slopes that are severely eroded.	Good for all slopes, except fair for severely eroded slopes.	Good.	Good.	Very poor: no suitable plant species for food and cover.	Very poor: water table too deep.	Good for all slopes, except fair for those that are severely eroded.	Good for all slopes, except fair for those that are severely eroded.	Very poor: no suitable wetland food and cover plants; water supply limited.
Group 2. Deep, well-drained and moderately well-drained, very strongly sloping soils on uplands and terraces.	Poor: slope severely limits use.	Fair: slope moderately limits use.	Good.	Good.	Very poor: no suitable plant species for food and cover.	Very poor: too sloping and water table too deep.	Fair: production of grain and seed crops severely limited.	Good: production of grasses and legumes moderately limited.	Very poor: no suitable wetland food and cover plants; water supply limited.
Group 3. Deep, somewhat poorly drained, nearly level to strongly sloping soils on uplands and terraces.	Good for drained areas. Fair for undrained areas; wetness is a hazard.	Good for drained areas. Fair for undrained areas; wetness is a hazard.	Good.	Good.	Fair: limited number of suitable species for food and cover.	Fair: water table not high enough to maintain water level all year. Poor for soils on 2 to 4% slopes. Very poor for soils with more than 4% slopes.	Good.	Good	Fair: water supply and number of suitable wetland food and cover plants moderately limited.
Group 4. Deep, somewhat poorly and moderately well-drained, nearly level soils on bottomlands.	Fair for most soils: wetness and flooding are hazards. Good for Dorchester (239) and Huntsville (77) soils and all drained areas.	Fair for most soils: wetness and flooding are hazards. Good for Dorchester (239) and Huntsville (77) soils and all drained areas.	Good.	Good.	Fair for most soils: limited number of suitable species for food and cover. Poor for Dorchester (239) and Huntsville (77) soils.	Fair for most soils: water table not high enough to maintain water level all year. Poor for Dorchester (239) and Huntsville (77) soils.	Good for most soils: production of grain and seed crops moderately limited in undrained areas.	Good for drained areas. Fair for undrained areas; growth of grasses and legumes moderately limited.	Fair for most soils: water supply and number of suitable wetland food and cover plants moderately limited. Poor for Dorchester (239) and Huntsville (77) soils.
Group 5. Deep, poorly drained to very poorly drained, nearly level to gently sloping soils on uplands, terraces, and bottomlands.	Good for drained areas. Fair for undrained soils: wetness hazard; flooding or ponding limits growth. Very poor for all wet soils.	Good for drained areas. Fair for undrained soils: wetness hazard; flooding or ponding limits growth.	Good for drained areas. Fair for undrained soils: wetness hazard; flooding or ponding limits growth. Poor for all wet soils.	Good for drained areas. Fair for undrained soils. Poor for all wet soils; bottomland soils subject to flooding.	Poor for drained areas: number of suitable species limited. Good for undrained areas.	Fair for drained areas: water supply limited. Good for undrained areas. Poor for soils on 2 to 4% slopes; bottomland soils subject to flooding.	Good for drained areas. Fair for undrained areas; grain and seed crops somewhat limited.	Good for drained areas. Fair for undrained areas; growth of food and cover plants is limited.	Poor for drained areas: number of suitable wetland food and cover plants severely limited. Good for undrained areas.
Group 6. Shallow and moderately deep, well-drained to excessively drained, moderately sloping to steep soils on uplands and terraces.	Poor for most soils: slope or low available water capacity limits use.	Fair for most soils: slope or low available water capacity limits use.	Fair: low available water capacity or shallow depth to bedrock limits use for most soils.	Fair: low available water capacity or shallow depth to bedrock limits use for most soils.	Very poor: low available water and no suitable plant species.	Very poor: too sloping or water table too deep.	Fair for most soils; low available water severely limits growth of food and cover plants.	Fair for most soils; low available water severely limits growth of food and cover plants.	Very poor: no suitable wetland food and cover plants; water supply limited.

Group 1 units: 21B, 21C, 21C2, 21D2 (Pecatonica); 22C2, 22D2, 22D3 (Westville); 27C2, 27D2, 27D3 (Miami); 36A, 36B, 36C, 36C2, 36D2 (Tama); 87B, 87C2 (Dickinson); 105A, 105B, 105C (Batavia); 134B, 134C, 134C2, 134D2, 134D3 (Camden); 148A, 148B, 148C, 148C2, 148D2 (Proctor); 171B, 171C, 171C2, 171D2 (Catlin); 194C, 194C2, 194D2 (Morley); 199A, 199B, 199C, 199C2 (Plano); 221B, 221C, 221C2, 221D2 (Parr); 223C, 223C2, 223D2 (Varna); 227B, 227C, 227C2, 227D2 (Argyle); 233B, 233C2, 233D2 (Birkbeck); 243A, 243B, 243C, 243C2 (St. Charles); 279A, 279B (Rozetta); 280B, 280C, 280C2, 280D, 280D2, 280D3 (Fayette); 344A, 344B, 344C, 344C2, 344D2 (Harvard); 361D2, 361D3 (Kidder); 363D2 (Griswold); 386A, 386B, 386C, 386C2, 386D2 (Downs); 410B, 410C, 410C2, 410D, 410D2, 410D3 (Woodbine); 411B, 411C, 411C2, 411D2 (Ashdale); 412B, 412C, 412C2, 412D2 (Ogle); 414B, 414C, 414C2, 414D2 (Myrtle); 416B, 416C, 416C2, 416D2 (Durand); 417C2, 417D2, 417D3 (Derinda); 418C2, 418D2 (Schapville); 419B, 419C, 419C2, 419D2 (Flagg); 429B, 429C, 429C2, 429D, 429D2 (Palsgrove); 506B, 506C, 506C2, 506D2 (Hitt); 546B, 546C, 546C2, 546D2 (Keltner); 547B, 547C, 547C2, 547D2 (Eleroy); 656C2, 656D2 (Octagon); 731B, 731C, 731C2, 731D2 (Nasset); 752C, 752C2, 752D2 (Oneco); 753B, 753C, 753C2, 753D2 (Massbach).

Group 2 units: 22E2 (Westville); 27E2 (Miami); 134E2 (Camden); 194E2 (Morley); 280E2 (Fayette); 410E2 (Woodbine).

Group 3 units: 41A, 41B (Muscatine); 61A, 61B (Atterberry); 104A, 104B (Virgil); 198A, 198B (Elburn); 219 (Millbrook); 242A, 242B (Kendall); 278 (Stronghurst); 572B, 572C (Loran); 743B, 743C (Ridott); 745B, 745C, 745C2, 745D2 (Shullsburg); 970C2, 970D2 (Keller-Coatsburg complex); 971C2, 971D2 (Fishhook-Atlas complex).

Group 4 units: 74 (Radford); 77 (Huntsville); 239 (Dorchester); 415 (Orion); 451 (Lawson); 578 (Dorchester, cobbly subsoil variant).

Group 5 units: 67 (Harpster); 68 (Sable); W74 (Radford); 76, W76 (Otter); 82 (Millington); 103, W103 (Houghton); 107, W107 (Sawmill); 152 (Drummer); 206 (Thorp); 210 (Lena); 272 (Edgington); 746B (Calamine).

Group 6 units: 29C, 29C2, 29D, 29D2 (Dubuque); 40C, 40C2, 40D2, 40E2 (Dodgeville); 290C2, 290D2 (Warsaw); 417E2 (Derinda); 504D2, 504F2 (Sogn); 969D2, 969E2 (Rodman-Casco complex); 972C2, 972D2, 972E2 (Casco-Fox complex); 973D3, 973E2, 973E3, 973F2 (Dubuque and Dunbarton, undifferentiated).

TABLE 7. — RECREATIONAL USES OF SOILS

Recreation group	Degree of limitations and soil features affecting use for: Cottages and utility buildings	Campsites	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Group 1. Well- and moderately well-drained, nearly level to moderately sloping soils on uplands and terraces.	Slight. Moderate for Dodgeville and Dubuque, limited by depth to bedrock.	Slight.	Slight.	Slight for 0 to 2% slopes; moderate for 2 to 7% slopes; moderate limitations for grading and leveling. Moderate for Dodgeville, Dubuque, and Derinda, limited by depth to bedrock.	Slight.	Slight.
Group 2. Excessively to moderately well-drained, strongly sloping soils on uplands and terraces.	Moderate, slope limits use. Also, depth to bedrock limits excavations for Dubuque, Dunbarton, Derinda and Sogn soils.	Moderate, slope limits use.	Moderate, slope limits use.	Moderate, slope limits use. Also, depth to bedrock limits excavations for Dubuque, Dunbarton, Derinda, and Sogn soils.	Slight.	Moderate, slope limits use.
Group 3. Excessively to moderately well-drained, very strongly sloping to steep soils on uplands and terraces.	Severe, slope limits use.	Severe, slope limits use.	Severe, slope limits use.	Severe, slope limits use.	Moderate on 12 to 18% slopes. Severe on slopes exceeding 18%.	Severe, slope limits use.
Group 4. Somewhat poorly drained, nearly level to strongly sloping soils on uplands and terraces.	Moderate. 12 to 36 inches to seasonal water table; high to moderate potential frost action; slopes also limit use of some soils.	Moderate, 12 to 36 inches to seasonal water table; slopes also limit use of some soils.	Moderate, 12 to 36 inches to seasonal water table; slopes also limit use of some soils.	Moderate, 12 to 36 inches to seasonal water table; slopes also limit use of some soils.	Moderate, 12 to 36 inches to seasonal water table.	Moderate, 12 to 36 inches to seasonal water table.
Group 5. Somewhat poorly drained to moderately well-drained, nearly level soils on bottomlands.	Severe, subject to flooding; high potential frost action.	Severe, subject to flooding.	Severe, subject to flooding.	Severe, subject to flooding.	Moderate, subject to flooding.	Severe, subject to flooding.
Group 6. Poorly drained and very poorly drained, nearly level to gently sloping soils on uplands and terraces.	Severe, less than 12 inches to seasonal water table; soils dry slowly; moderate to high potential frost action; high to moderate shrink-swell potential in the subsoil.	Severe, less than 12 inches to seasonal water table; soils dry slowly; moderate to high potential frost action; drainage needed in most places; turf easily damaged when wet.	Severe, less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places; turf easily damaged when wet.	Severe, less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places; turf easily damaged when wet.
Group 7. Poorly and very poorly drained, nearly level soils on bottomlands.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; high to moderate potential frost action.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.	Severe, subject to flooding and ponding; less than 12 inches to seasonal water table; soils dry slowly; drainage needed in most places.

Group 1 units: 21B, 21C, 21C2 (Pecatonica); 22C2 (Westville); 27C2 (Miami); 29C, 29C2 (Dubuque); 36A, 36B, 36C, 36C2 (Tama); 40C, 40C2 (Dodgeville); 87B, 87C2 (Dickinson); 105A, 105B, 105C (Batavia); 134B, 134C, 134C2 (Camden); 148A, 148B, 148C, 148C2 (Proctor); 171B, 171C, 171C2 (Catlin); 194C, 194C2 (Morley); 199A, 199B, 199C, 199C2 (Plano); 221B, 221C, 221C2 (Parr); 223C, 223C2 (Varna); 227B, 227C, 227C2 (Argyle); 233B, 233C2 (Birkbeck); 243A, 243B, 243C, 243C2 (St. Charles); 279A, 279B (Rozetta); 280B, 280C, 280C2 (Fayette); 290C2 (Warsaw); 344A, 344B, 344C, 344C2 (Harvard); 386A, 386B, 386C, 386C2 (Downs); 410B, 410C, 410C2 (Woodbine); 411B, 411C, 411C2 (Ashdale); 412B, 412C, 412C2 (Ogle); 414B, 414C, 414C2 (Myrtle); 416B, 416C, 416C2 (Durand); 417C2 (Derinda); 418C2 (Schapville); 419B, 419C, 419C2 (Flagg); 429B, 429C, 429C2 (Palsgrove); 506B, 506C, 506C2 (Hitt); 546B, 546C, 546C2 (Keltner); 547B, 547C, 547C2 (Eleroy); 656C2 (Octagon); 731B, 731C, 731C2 (Nasset); 752C, 752C2 (Oneco); 753B, 753C, 753C2 (Massbach).

Group 2 units: 21D2 (Pecatonica); 22D2, 22D3 (Westville); 27D2, 27D3 (Miami); 29D, 29D2 (Dubuque); 36D2 (Tama); 40D2 (Dodgeville); 134D2, 134D3 (Camden); 148D2 (Proctor); 171D2 (Catlin); 194D2 (Morley); 221D2 (Parr); 223D2 (Varna); 227D2 (Argyle); 233D2 (Birkbeck); 280D, 280D2, 280D3 (Fayette); 290D2 (Warsaw); 344D2 (Harvard); 361D2, 361D3 (Kidder); 363D2 (Griswold); 386D2 (Downs); 410D, 410D2, 410D3 (Woodbine); 411D2 (Ashdale); 412D2 (Ogle); 414D2 (Myrtle); 416D2 (Durand); 417D2, 417D3 (Derinda); 418D2 (Schapville); 419D2 (Flagg); 429D, 429D2 (Palsgrove); 504D2 (Sogn); 506D2 (Hitt); 546D2 (Keltner); 547D2 (Eleroy); 656D2 (Octagon); 731D2 (Nasset); 752D2 (Oneco); 753D2 (Massbach); 969D2 (Rodman-Casco complex); 972C2, 972D2 (Casco-Fox complex); 973D3 (Dubuque and Dunbarton, undifferentiated).

Group 3 units: 22E2 (Westville); 27E2 (Miami); 40E2 (Dodgeville); 134E2 (Camden); 194E2 (Morley); 280E2 (Fayette); 410E2 (Woodbine); 417E2 (Derinda); 504F2 (Sogn); 969E2 (Rodman-Casco complex); 972E2 (Casco-Fox complex); 973E2, 973E3, 973F2 (Dubuque and Dunbarton, undifferentiated).

Group 4 units: 41A, 41B (Muscatine); 61A, 61B (Atterberry); 104A, 104B (Virgil); 198A, 198B (Elburn); 219 (Millbrook); 242A, 242B (Kendall); 278 (Stronghurst); 572B, 572C (Loran); 743B, 743C (Ridott); 745B, 745C, 745C2, 745D2 (Shullsburg); 970C2, 970D2 (Keller-Coatsburg complex); 971C2, 971D2 (Fishhook-Atlas complex).

Group 5 units: 74 (Radford); 77 (Huntsville); 239 (Dorchester); 415 (Orion); 451 (Lawson); 578 (Dorchester, cobbly subsoil variant).

Group 6 units: 67 (Harpster); 68 (Sable); 152 (Drummer); 206 (Thorp); 272 (Edgington); 746B (Calamine).

Group 7 units: W74 (Radford); 76, W76 (Otter); 82 (Millington); 103, W103 (Houghton); 107, W107 (Sawmill); 210 (Lena).

Golf fairways. The soils are rated only according to their limitations for fairways. Greens, traps, and hazards generally are made from transported soil material. Soils used for fairways should support intensive traffic of people on foot or driving golf carts. In addition, turf and various kinds of trees and shrubs should be able to grow well on these soils.

Engineering Properties and Uses of the Soils

This section gives soil characteristics and interpretations that are likely to influence engineering practices. It is intended to help engineers use the soil survey information in this report, in the following ways:

1. To make soil and land-use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. To make preliminary estimates of the engineering properties of soils that are significant in planning for flood prevention, agricultural drainage systems, farm ponds, irrigation systems, diversions, terraces, and waterways.
3. To make preliminary evaluations of soils and sites that will aid in selecting locations for highways, airports, pipelines, cables, low buildings, and sewage disposal systems.
4. To locate probable sources of gravel, sand, and limestone to be used for construction materials.
5. To correlate performance of engineering structures with soils and thus gain information that will be useful in designing and maintaining the structures.
6. To determine the suitability of soil units for cross-country movement of vehicles and construction equipment.
7. To supplement information from other published maps and reports and aerial photographs to make maps and reports that can be used readily by engineers.

The engineering interpretations are generalized and should be used primarily in planning more detailed field investigations to determine the characteristics of the soil material in place at the site of the proposed engineering work.

Some terms used by the agricultural soil scientist may be unfamiliar to the engineer, and some terms may have a special meaning in soil science. These terms are defined in the Glossary at the end of this report.

PHYSICAL AND CHEMICAL PROPERTIES

Table 8 gives the measured or estimated physical and chemical properties important to engineering.

Columns 1 and 2. The map symbols refer to those used on the map sheets at the back of the report; the soil name includes the series name and dominant surface texture.

Column 3. The "Depth to bedrock" column gives depth in feet from ground level to limestone or limestone residuum, sandstone, or shale bedrock. If no depth is listed, then bedrock is deeper than at least 5 feet.

Column 4. The "Depth to seasonal high water table" column gives depth in feet from ground level to a free water table during the wettest season.

Column 5. The "Depth from surface" column gives depths from the ground surface for the major soil layers that are significant for engineering interpretations.

Estimates are made to a depth of 60 inches, or to bedrock if encountered at less than 60 inches. For some of the soils, the material shown at the 60-inch depth can be expected to continue for many feet. This should be determined conclusively by on-site investigations.

The depths shown are for essentially uneroded sites, but the map symbols in Column 1 are for uneroded or slightly eroded, moderately eroded, and severely eroded conditions. The following can be used when applying the interpretations to a specific map symbol. No digit after the slope letter indicates the soil is uneroded or slightly eroded and has the same or similar kinds and thicknesses of layers as shown in Column 5. A "2" following the slope letter indicates the soil is generally moderately eroded; this means that some of the material shown in the table as lying below a 10- or 12-inch depth may actually have been mixed with the original surface layer through tillage and the existing surface layer may thus tend to be influenced by the properties of the upper subsoil. A "3" after the slope letter indicates that about the first foot of material shown has eroded away and the material listed as lying below 10 or 12 inches (generally subsoil) is now exposed at the surface.

Columns 6, 7, and 8. The columns under "Classification" refer to the USDA Texture and Unified and AASHO Classification Systems, respectively. The USDA Texture System is based on the relative proportion of various size groups of individual soil grains in a mass of soil. Soil material smaller than 2.0 mm. in diameter is classified in three size fractions as sand, silt, or clay. The percentages of the three size fractions determine the textural class names such as sandy loam, silt loam, or silty clay loam.

The Unified Classification System is based on the identification of soils according to particle size, plasticity, and liquid limit. SP is clean sands. SM and SC are sands with nonplastic or plastic fines. GW and GP are clean gravels, and GM is gravelly soils with nonplastic or plastic fines. ML and CL are nonplastic or plastic fine-grained materials with low liquid limit; MH and CH are primarily nonplastic or plastic fine-grained materials with high liquid limit. OH are organic clays of medium to high plasticity and high liquid limit. Pt refers to highly organic soils such as muck or peats.

The American Association of State Highway Officials (AASHO) System is based on the field performance of highways. Soils with about the same general load-carrying capacity and service properties are grouped into seven basic groups. The best soils for road subgrades are classified A-1; the poorest, A-7. These groups can be further divided into subgroups; however, only the basic group classification has been used in Table 8.

In general, the USDA Texture, Unified, and AASHO columns show the dominant classification first. If dual classifications are shown, an "or" between them (such as, ML or CL) is used.

Columns 9, 10, and 11. The columns under "Percent passing sieve" list the measured or estimated percentages of material passing through the No. 4 (4.7 mm.), No. 10 (2.0 mm.), and No. 200 (.074 mm.) sieves for each major layer. Where 100 percent of the sample is listed as passing a given sieve size, 1 to 2 percent in some samples will not pass. The values in all samples were rounded off to the nearest 5 percent, because more accurate estimates are impractical. Most soils will fall within the range given, but the grain size of any soil varies considerably. Therefore, it should not be assumed that all samples of a specific soil will fall within the range shown nor that the engineering classification will invariably be as given.

Column 12. The "Permeability" column refers to the rate of water movement downward through undisturbed soil or substratum. This value is predicted by comparison with soils of known permeability and estimates based on the soils' texture, structure, and consistence. The table shows the range within which the soil will normally fall. Permeability rates, in inches per hour, are as follows: very slow, less than 0.06; slow, 0.06 to 0.20; moderately slow, 0.20 to 0.60; moderate, 0.60 to 2.0; moderately rapid, 2.0 to 6.0; and rapid, 6.0 to 20.0.

Column 13. The "Available water capacity" column gives the estimated inches of available water per inch of soil for the major soil layers. The figures given represent the estimated range of available water within the major layers of each soil. Cumulative totals, by major layers to 60-inch depths, of available water in in./in. can be calculated to give total available water. Numerical ranges per 60-inch depth in Stephenson County are very low, less than 3 inches; low, 3 to 6 inches; moderate, 6 to 9 inches; high, 9 to 12 inches; very high, 12 inches or more.

Column 14. The "Reaction" column lists estimated ranges in field pH values for each major layer. These ranges are very strongly acid, 4.5 to 5.0; strongly acid, 5.1 to 5.5; medium acid, 5.6 to 6.0; slightly acid, 6.1 to 6.5; neutral, 6.6 to 7.3; mildly alkaline, 7.4 to 7.8 (calcareous); moderately alkaline, 7.9 to 8.4 (calcareous); strongly alkaline, 8.5 to 9.0 (calcareous); and very strongly alkaline, above 9.0 (calcareous). A pH of 7 is neutral, lower values indicate acidity, and higher values express alkalinity.

Column 15. The "Shrink-swell potential" column rates each major soil layer as low, moderate, or high. Shrink-swell potential is that quality of the soil that determines its change in volume with change in moisture content. The amount and type of clay in a soil as well as the organic matter content determine to a great extent the shrink-swell potential for a particular soil layer. Other factors that affect the shrink-swell potential of soil material used for engineering construction are initial moisture content, dry density, degree of compaction, and amount of confining pressure.

Column 16. The "Corrosion potential" column rates each major soil layer as low, moderate, or high. Corrosion is given in relation to concrete conduits for the major soil layers in which the conduits would likely be placed. Where soil properties place the soil in more than one rating, or indicate a range in rating, the most severe rating is used. Because of the many variables involved, these ratings serve only as a general guide.

INTERPRETATIONS OF ENGINEERING PROPERTIES

Table 9 gives engineering interpretations of Stephenson County soils with respect to suitability as sources of construction material and to soil features that affect suitability for engineering practices.

Column 1. The soil name includes the series name and dominant surface texture; the map symbols refer to the symbols used on the map sheets at the back of the report.

Column 2. The "Topsoil" column rates the surface and subsoil layers as good, fair, poor, or very poor as a source of topsoil. Topsoil refers to soil material used to top-dress areas such as roadbanks, lawns, gardens and dams. The ratings are based upon the soils' relative amount of organic matter, available moisture capacity, ease of working the soil, and natural high lime content. Surface layers were not rated for soils that occur only as moderately or severely eroded. The qualifying statements following the ratings refer to the soils' shortcomings rather than their merits. Soils rated good would have few if any limitations. Soils rated less than good could be expected to be limited by such factors as low organic matter content, low available water capacity, unfavorable tilth, or hazard of excavation because of frequent high water table.

Column 3. The "Sand or gravel" column gives qualifying statements about the soils' suitability as a source of sand, gravel, or crushed limestone. A "not suitable" notation is listed for soils where sand and gravel is not expected within 60 inches. Soils considered as a source of sand or gravel will in some places require exploring to find material that meets engineering specifications.

Column 4. The "Highway subgrade material" column rates the subsoil and substrata as a source of road fill. Ratings are based on the performance of the soil material when excavated and used as borrow for high-

TABLE 8. — SOILS OF STEPHENSON COUNTY, ILLINOIS, AND THEIR ESTIMATED PHYSICAL AND CHEMICAL PROPERTIES

Symbol on map	Soil name	Depth to bedrock	Depth to seasonal high water table	Depth from surface (in.)	Classification: USDA Texture	Classification: Unified	Classification: AASHO	Percent passing sieve: No. 4	Percent passing sieve: No. 10	Percent passing sieve: No. 200	Permeability (in./hr.)	Available water capacity (in./in. of soil)[a]	Reaction (pH)	Shrink-swell potential	Corrosion potential for concrete conduits[b]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
227B 227C 227C2 227D2	Argyle silt loam		Greater than 3 feet	0–12	Silt loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				12–53	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.15–.20	5.6–6.5	Moderate	Moderate
				53–60	Loam	ML or CL	A-4 or A-6	100	100	60–75	0.6–2.0	.17–.19	7.4–8.4 (calc.)	Low to mod.	Low
411B 411C 411C2 411D2	Ashdale silt loam	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–15	Silt loam	CL or ML	A-6 or A-7	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Moderate	. . .
				15–43	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.18–.20	5.6–6.0	Moderate	Moderate
				43–51	Clay	CH	A-7	100	100	75–95	.06–0.6	.08–.10	6.1–6.5	High	Low
				51–60	Limestone bedrock	. . .	. . .	. . .	. . .	. . .	Variable	. . .	Calcareous	. . .	. . .
971C2 971D2	Atlas silt loam (Mapped only in complex with Fishhook series. See also Fishhook.)		1½ to 2½ feet	0–9	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	5.1–6.0	Moderate	. . .
				9–16	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.1–6.0	Mod. to high	Moderate
				16–60	Silty clay loam, clay loam, and silty clay	CL	A-6 or A-7	100	95–100	80–95	.06–0.2	.09–.14	5.6–6.5	High	Low to mod.
61A 61B	Atterberry silt loam		1½ to 2½ feet	0–18	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.1–7.3	Low to mod.	. . .
				18–44	Silty clay loam	CL	A-7	100	100	95–100	0.2–2.0	.18–.20	5.6–6.5	Moderate	Moderate
				44–60	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.20–.22	7.4–7.8	Low to mod.	Low
105A 105B 105C	Batavia silt loam		Greater than 2½ feet	0–12	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				12–50	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.15–.20	5.6–6.5	Low to mod.	Moderate
				50–60	Sandy loam to silt loam	SM or ML	A-2 or A-4	100	100	30–40	0.6–2.0	.13–.18	6.1–6.5	Low	Low
233B 233C2 233D2	Birkbeck silt loam		Greater than 2½ feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				11–48	Silty clay loam to clay loam	CL	A-7 or A-6	100	100	95–100	0.6–2.0	.15–.19	5.6–7.8	Moderate	Moderate
				48–60	Silty clay loam to loam	CL or ML	A-6 or A-4	100	100	60–80	0.6–2.0	.14–.18	7.4–8.4 (calc.)	Moderate	Low
746B	Calamine silt loam	2 to 4 feet to shale	Less than 1½ feet	0–24	Silt loam to silty clay loam	CL	A-7 or A-6	100	100	70–95	0.6–2.0	.21–.24	6.1–7.3	Mod. to high	Low
				24–60	Silty clay to clay	CL	A-7	90–100	85–100	70–95	Less than .2	.10–.13	7.4–8.4 (calc.)	High	Low
134B 134C 134C2 134D2 134D3 134E2	Camden silt loam and Camden soils		Greater than 2½ feet	0–14	Silt loam	ML or CL	A-6 or A-4	100	100	70–90	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				14–31	Silty clay loam	CL	A-7	100	100	85–95	0.6–2.0	.18–.20	5.1–7.3	Moderate	Moderate
				31–52	Sandy clay loam to clay loam	SC or CL	A-4 or A-6	100	100	60–80	0.6–2.0	.14–.17	4.5–5.5	Moderate	Moderate
				52–60	Silt loam to loam	ML or CL	A-4 or A-6	100	85–95	60–80	0.6–2.0	.17–.20	5.6–6.0	Low	Moderate
972C2 972D2 972E2	Casco silt loam (Mapped only in complex with Fox series as 972 or with Rodman series as 969. See Fox and Rodman.)		Greater than 5 feet	0–8	Silt loam	ML or CL	A-4 or A-6	100	100	50–70	0.6–2.0	.22–.24	6.6–7.3	Low	. . .
				8–16	Clay loam	CL	A-6 or A-7	100	100	45–70	0.6–2.0	.15–.19	7.4–7.8	Moderate	Low
				16–60	Gravel and sand	GM or GC	A-1	50–80	25–70	3–10	6.0–20.0	.02–.04	7.4–8.4 (calc.)	Low	Low
171B 171C 171C2 171D2	Catlin silt loam		Greater than 2½ feet	0–15	Silt loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.22–.24	5.6–7.3	Moderate	. . .
				15–45	Silty clay loam	CL	A-7	100	100	85–95	0.6–2.0	.18–.20	5.1–6.0	Mod. to high	Moderate
				45–60	Silty clay loam	CL	A-7	95–100	90–100	80–95	0.2–2.0	.18–.20	7.4–8.4 (calc.)	Mod. to high	Low
970C2 970D2	Coatsburg silt loam (Mapped only in complex with Keller series. See also Keller.)		Less than 1½ feet	0–16	Silt loam to silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.21–.23	5.1–7.8	Moderate	. . .
				16–44	Silty clay	CH	A-7	100	100	90–95	Less than .06	.10–.12	5.6–6.5	High	Moderate
				44–60	Clay loam	CL	A-6 or A-7	100	100	80–90	.06–0.2	.13–.15	6.1–7.3	Mod. to high	Low

[a] Root penetration may be restricted in some layers so that plants may not be able to use all the available water indicated.
[b] Corrosion potential is estimated only for those depths or layers where conduits are likely to be buried.

TABLE 8 (cont.)

Symbol on map	Soil name	Depth to bedrock	Depth to seasonal high water table	Depth from surface (in.)	Classification			Percent passing sieve			Permeability (in./hr.)	Available water capacity (in./in. of soil)	Reaction (pH)	Shrink-swell potential	Corrosion potential for concrete conduits
					USDA Texture	Unified	AASHO	No. 4	No. 10	No. 200					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
417C2 417D2 417D3 417E2	Derinda silt loam and Derinda soils.	1½ to 3 feet to shale	Greater than 2½ feet	0–7	Silt loam	ML or CL	A-4	100	100	95–100	0.6–2.0	.20–.24	6.1–6.5	Moderate	...
				7–25	Silty clay loam to silty clay	CL	A-7 or A-6	80–100	70–95	70–95	0.2–0.6	.10–.18	6.1–7.8	High	Low
				25–60	Clay shale bedrock	CL	A-6	90–100	90–100	80–95	Less than .2	.08–.10	7.4–8.4 (calc.)	High	Low
87B 87C2	Dickinson sandy loam		Greater than 5 feet	0–24	Sandy loam	SM or SC	A-2 or A-4	100	100	30–40	2.0–6.0	.11–.14	5.6–6.5	Low	...
				24–60	Fine sand to loamy fine sand	SP or SM	A-2 or A-4	100	100	15–35	6.0–20.0	.07–.10	5.6–6.0	Low	Low
40C 40C2 40D2 40E2	Dodgeville silt loam	1½ to 3 feet to limestone or residuum	Greater than 5 feet	0–11	Silt loam	CL or ML	A-6	100	100	70–90	0.6–2.0	.22–.24	6.6–7.3	Moderate	...
				11–24	Silty clay loam	CL	A-6 or A-7	100	100	85–95	0.6–2.0	.19–.21	5.6–6.5	Moderate	Moderate
				24–33	Silty clay to clay	CH	A-7	100	100	75–95	.06–0.6	.09–.13	5.6–6.0	High	Moderate
				33–60	Limestone bedrock	...	...	...	...	...	Variable	...	Calcareous	...	...
239	Dorchester silt loam		1 to 3 feet	0–60	Silt loam	ML or CL	A-4 or A-6	100	100	70–90	0.6–2.0	.22–.24	7.4–8.4 (calc.)	Low to mod.	Low
578	Dorchester silt loam, cobbly subsoil variant	About 3 feet to cobbly material	1 to 3 feet	0–24	Silt loam	ML or CL	A-4 or A-6	100	100	70–90	0.6–2.0	.22–.24	7.4–8.4 (calc.)	Low to mod.	Low
				24–34	Gravelly loam	GM or ML	A-2 or A-4	70–90	60–80	10–60	2.0–6.0	.17–.19	7.4–8.4 (calc.)	Low to mod.	Low
				34–60	Mixed chert, limestone cobbles, and igneous rocks	...	...	...	...	...	6.0–20.0	.02–.04	7.4–8.4 (calc.)	Low	Low
386A 386B 386C 386C2 386D2	Downs silt loam		Greater than 2½ feet	0–14	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.6–7.3	Moderate	...
				14–54	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.19–.21	5.6–6.5	Moderate	Moderate
				54–60	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.20–.22	6.1–6.5	Low to mod.	Low
152	Drummer silty clay loam		Less than 1½ feet	0–15	Silty clay loam	CL, CH, or OH	A-7	100	100	95–100	0.6–2.0	.21–.23	6.6–7.8	Moderate	...
				15–43	Silty clay loam	CL or CH	A-7 or A-6	100	100	95–100	0.6–2.0	.19–.21	6.6–7.8	Mod. to high	Low
				43–60	Silt loam, loam, and sandy loam	SC or CL	A-4 or A-6	100	100	40–85	0.6–2.0	.17–.22	7.4–8.4 (calc.)	Mod. to low	Low
29C 29C2 29D 29D2	Dubuque silt loam (Also mapped in an undifferentiated unit with Dunbarton series as 973. See also Dunbarton.)	1½ to 3 feet to limestone or residuum	Greater than 5 feet	0–8	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–6.5	Low	...
				8–26	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.20–.22	5.6–6.0	Moderate	Moderate
				26–31	Silty clay to clay	CH	A-7	100	100	75–95	.06–0.6	.09–.13	6.6–7.3	High	Low
				31–60	Limestone bedrock	...	...	...	...	...	Variable	...	Calcareous	...	...
973D3 973E2 973E3 973F2	Dunbarton silt loam and silty clay loam (Mapped only as an undifferentiated unit with Dubuque series. See also Dubuque.)	Less than 1½ feet to limestone	Greater than 5 feet	0–6	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	...
				6–10	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.19–.21	6.6–7.3	Mod. to high	Low
				10–17	Clay	CH	A-7	100	100	75–95	.06–0.6	.11–.13	6.6–7.3	High	Low
				17–60	Limestone bedrock	...	...	...	...	...	Variable	...	Calcareous	...	...
416B 416C 416C2 416D2	Durand silt loam		Greater than 3 feet	0–10	Silt loam	ML or CL	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	7.4–7.8	Moderate	...
				10–60	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.14–.20	6.1–7.3	Moderate	Low to mod.
272	Edgington silt loam		Less than 1½ feet	0–25	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.1–7.3	Low to mod.	Moderate
				25–54	Silty clay loam to silty clay	CL or CH	A-7	100	100	90–100	0.2–0.6	.10–.16	5.6–7.3	Mod. to high	Moderate
				54–60	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.20–.22	6.6–7.3	Low to mod.	Low
198A 198B	Elburn silt loam		1½ to 2½ feet	0–13	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Moderate	...
				13–44	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.18–.20	6.1–7.3	Moderate	Low
				44–60	Silt loam, loam, and sandy loam	SM or CL	A-4 or A-6	100	100	30–90	0.6–6.0	.13–.22	7.4–8.4 (calc.)	Low to mod.	Low

TABLE 8 (cont.)

Symbol on map	Soil name	Depth to bedrock	Depth to seasonal high water table	Depth from surface (in.)	Classification: USDA Texture	Classification: Unified	Classification: AASHO	Percent passing sieve: No. 4	Percent passing sieve: No. 10	Percent passing sieve: No. 200	Perme-ability (in./hr.)	Available water capacity (in./in. of soil)	Reaction (pH)	Shrink-swell potential	Corrosion potential for concrete conduits
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
547B 547C 547C2 547D2	Eleroy silt loam	3 to 5 feet to shale	Greater than 2½ feet	0–8	Silt loam	ML or CL	A-4 or A-6	100	95–100	90–100	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				8–42	Silty clay loam	CL	A-6 or A-7	100	100	90–100	0.6–2.0	.18–.20	5.1–7.3	Mod. to high	Moderate
				42–60	Clay shale bedrock	CL	A-7	90–100	90–100	75–95	Less than .2	.08–.10	7.4–8.4 (calc.)	High	Low
280B 280C 280C2 280D 280D2 280D3 280E2	Fayette silt loam and Fayette soils		Greater than 5 feet	0–10	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.6–7.8	Low	. . .
				10–60	Silty clay loam	CL	A-7 or A-6	100	100	95–100	0.6–2.0	.18–.20	4.5–6.0	Moderate	Moderate
971C2 971D2	Fishhook silt loam (Mapped only in complex with Atlas series. See also Atlas.)		1½ to 2½ feet	0–10	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	4.5–6.0	Moderate	. . .
				10–33	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.18–.20	4.5–5.5	Mod. to high	Moderate
				33–60	Silty clay to silty clay loam	CH	A-7	100	100	85–95	.06–0.2	.10–.18	5.1–7.8	High	Low to mod.
419B 419C 419C2 419D2	Flagg silt loam		Greater than 5 feet	0–11	Silt loam	ML	A-6	100	100	95–100	0.6–2.0	.22–.24	5.6–6.0	Low to mod.	. . .
				11–39	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.1–6.0	Moderate	Moderate
				39–60	Clay loam	CL	A-6	100	95–100	70–80	0.6–2.0	.14–.16	5.6–6.0	Moderate	Moderate
972C2 972D2 972E2	Fox silt loam (Mapped only in complex with Casco series. See also Casco.)		Greater than 5 feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	70–90	0.6–2.0	.22–.24	5.1–6.5	Low to mod.	. . .
				11–35	Clay loam to gravelly clay loam	CL	A-6 or A-7	85–100	75–90	55–85	0.6–2.0	.15–.19	5.1–7.3	Moderate	Moderate
				35–60	Gravel and sand	GP or GW	A-1	40–80	30–70	0–10	6.0–20.0	.02–.04	7.4–8.4 (calc.)	Low	Low
363D2	Griswold loam		Greater than 5 feet	0–7	Loam	ML or CL	A-4	100	100	60–75	0.6–2.0	.20–.22	6.6–7.3	Low	. . .
				7–22	Clay loam to sandy clay loam	CL or SC	A-6	100	100	30–80	0.6–2.0	.15–.18	6.1–7.3	Moderate	Low
				22–60	Sandy loam	SM or SC	A-2 or A-4	100	100	30–40	2.0–6.0	.11–.13	7.4–8.4 (calc.)	Low	Low
67	Harpster silty clay loam		Less than 1½ feet	0–24	Silty clay loam	CH or CL	A-7	100	100	95–100	0.6–2.0	.21–.23	7.4–8.4 (calc.)	Moderate	. . .
				24–40	Silty clay loam	CL or CH	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	7.4–8.4 (calc.)	Mod. to high	Low
				40–60	Silt loam	ML or CL	A-4 or A-6	100	100	90–100	0.6–2.0	.20–.22	7.4–8.4 (calc.)	Low to mod.	Low
344A 344B 344C 344C2 344D2	Harvard silt loam		Greater than 2½ feet	0–16	Silt loam	ML or CL	A-4 or A-6	100	100	70–90	0.6–2.0	.22–.24	5.6–7.8	Moderate	. . .
				16–31	Silty clay loam	CL	A-7	100	100	70–95	0.6–2.0	.17–.19	5.1–6.0	Moderate	Moderate
				31–60	Loam and fine sandy loam	CL or SM	A-4 or A-6	100	100	40–75	0.6–2.0	.14–.18	5.1–6.0	Low to mod.	Moderate
506B 506C 506C2 506D2	Hitt silt loam	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–8	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	7.4–7.8	Low to mod.	. . .
				8–39	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.15–.20	5.1–6.0	Mod. to high	Moderate
				39–44	Clay	CH	A-7	100	100	90–95	.06–0.6	.08–.10	6.6–7.3	High	Low
				44–60	Limestone bedrock	. . .	. . .	. . .	. . .	. . .	Variable	. . .	Calcareous	. . .	. . .
103 W103	Houghton muck		Less than 1 foot	0–60	Muck	Pt	. . .	. . .	. . .	. . .	0.6–2.0	Greater than .25	6.6–7.3	Low to mod.[c]	Low
77	Huntsville silt loam		Greater than 2½ feet	0–60	Silt loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.20–.24	6.1–7.3	Low to mod.	Low
970C2 970D2	Keller silt loam (Mapped only in complex with Coatsburg series. See also Coatsburg.)		1½ to 2½ feet	0–13	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	5.6–7.8	Moderate	. . .
				13–30	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.18–.20	5.1–5.5	Mod. to high	Moderate
				30–60	Silty clay, silty clay loam, and clay loam	CH or CL	A-7	100	100	80–95	.06–0.2	.10–.18	5.1–6.0	High	Moderate

[c] Organic materials (muck) are subject to extremely high volume changes due to compressibility and subsidence when drained.

TABLE 8 (cont.)

Symbol on map	Soil name	Depth to bedrock	Depth to seasonal high water table	Depth from surface (in.)	Classification: USDA Texture	Classification: Unified	Classification: AASHO	Percent passing sieve: No. 4	Percent passing sieve: No. 10	Percent passing sieve: No. 200	Perme-ability (in./hr.)	Available water capacity (in./in. of soil)	Reaction (pH)	Shrink-swell potential	Corrosion potential for concrete conduits
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
546B 546C 546C2 546D2	Keltner silt loam	3 to 5 feet to shale	Greater than 2½ feet	0–13	Silt loam	CL	A-4 or A-6	100	95–100	90–100	0.6–2.0	.22–.24	5.1–7.3	Moderate	. . .
				13–38	Silty clay loam	CL	A-6 or A-7	100	100	90–100	0.6–2.0	.18–.20	5.1–6.0	Mod. to high	Moderate
				38–60	Clay shale bedrock	CL	A-7	90–100	90–100	75–95	Less than .2	.08–.10	6.6–8.4 (calc.)	High	Low
242A 242B	Kendall silt loam		1½ to 2½ feet	0–18	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.1–7.3	Low	. . .
				18–43	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.18–.20	4.5–5.5	Moderate	Moderate
				43–60	Silt loam, loam, and fine sandy loam	CL or SM	A-4 or A-6	100	100	30–90	0.6–2.0	.14–.22	4.5–5.5	Low to mod.	Moderate
361D2 361D3	Kidder loam and Kidder soils		Greater than 5 feet	0–10	Loam to silt loam	ML or CL	A-4	100	100	60–90	0.6–2.0	.17–.21	6.6–7.3	Low	. . .
				10–26	Sandy clay loam	SC or CL	A-6	100	100	35–55	0.6–2.0	.15–.17	6.1–7.3	Moderate	Low
				26–60	Sandy loam	SM or SC	A-2 or A-4	100	100	30–40	2.0–6.0	.11–.13	7.4–8.4 (calc.)	Low	Low
451	Lawson silt loam		1 to 2½ feet	0–60	Silt loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.20–.24	6.6–7.8	Moderate	Low
210	Lena muck		Less than 1 foot	0–52	Muck	Pt	. . .	. . .	. . .	. . .	0.6–2.0	Greater than .25	7.4–8.4 (calc.)	Low to mod.[c]	Low
				52–60	Loam	ML or CL	A-4 or A-6	100	100	60–75	0.6–2.0	.17–.19	7.4–8.4 (calc.)	Low to mod.	Low
572B 572C	Loran silt loam	3 to 5 feet to shale	1½ to 2½ feet	0–13	Silt loam	CL	A-4 or A-6	100	95–100	90–100	0.6–2.0	.22–.24	6.6–7.3	Moderate	. . .
				13–40	Silty clay loam	CL	A-6 or A-7	100	100	90–100	0.6–2.0	.18–.20	6.6–7.3	Mod. to high	Low
				40–60	Clay shale bedrock	CL	A-7	90–100	90–100	75–95	Less than .2	.08–.10	7.4–8.4 (calc.)	High	Low
753B 753C 753C2 753D2	Massbach silt loam	3 to 5 feet to shale	Greater than 2½ feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	95–100	90–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				11–39	Silty clay loam	CL	A-6 or A-7	100	100	90–100	0.6–2.0	.18–.20	5.6–6.0	Mod. to high	Moderate
				39–60	Silty clay to clay shale bedrock	CL	A-7	100	100	75–95	Less than .2	.08–.10	6.6–8.4 (calc.)	High	Low
27C2 27D2 27D3 27E2	Miami silt loam and Miami soils		Greater than 5 feet	0–10	Silt loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				10–30	Clay loam	CL	A-6 or A-7	100	100	70–80	0.6–2.0	.15–.19	5.6–7.3	Moderate	Moderate
				30–60	Loam	ML or CL	A-4 or A-6	90–100	85–95	60–75	0.6–2.0	.17–.19	7.4–8.4 (calc.)	Low to mod.	Low
219	Millbrook silt loam		1½ to 2½ feet	0–11	Silt loam	ML or CL	A-6 or A-7	100	100	95–100	0.6–2.0	.22–.24	6.1–6.5	Moderate	. . .
				11–36	Silty clay loam, clay loam, and sandy clay loam	SC or CL	A-6 or A-7	100	100	35–95	0.6–2.0	.16–.20	5.6–6.5	Moderate	Moderate
				36–60	Sandy loam	SM or SC	A-2 or A-4	100	100	30–40	2.0–6.0	.11–.13	5.6–6.5	Low	Moderate
82	Millington silt loam		Less than 1 foot	0–60	Silt loam to loam	CL or ML	A-6 or A-4	100	100	60–90	0.6–2.0	.17–.20	7.4–8.4 (calc.)	Mod. to low	Low
194C 194C2 194D2 194E2	Morley silt loam		Greater than 2½ feet	0–12	Silt loam to silty clay loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				12–60	Silty clay to silty clay loam	CL or CH	A-7	95–100	90–100	85–95	0.2–0.6	.13–.18	6.6–8.4 (calc.)	Mod. to high	Low
41A 41B	Muscatine silt loam		1½ to 2½ feet	0–16	Silt loam	CL or ML	A-6	100	100	95–100	0.6–2.0	.22–.24	5.6–7.3	Moderate	. . .
				16–54	Silty clay loam	CL or CH	A-7	100	100	95–100	0.6–2.0	.19–.21	5.1–7.3	Mod. to high	Moderate
				54–60	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.20–.22	7.4–7.8	Moderate	Low
414B 414C 414C2 414D2	Myrtle silt loam		Greater than 5 feet	0–14	Silt loam	ML	A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				14–42	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.6–6.0	Moderate	Moderate
				42–60	Clay loam	CL	A-6	100	95–100	70–80	0.6–2.0	.14–.16	5.6–6.0	Moderate	Moderate
731B 731C 731C2 731D2	Nasset silt loam	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–11	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Moderate	. . .
				11–41	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.17–.19	5.1–6.0	Moderate	Moderate
				41–53	Clay	CH	A-7	100	100	75–95	.06–0.6	.08–.10	6.1–6.5	High	Low
				53–60	Limestone bedrock	. . .	. . .	. . .	. . .	. . .	Variable	. . .	Calcareous	. . .	. . .
656C2 656D2	Octagon silt loam		Greater than 5 feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	85–95	0.6–2.0	.22–.24	5.6–6.0	Low to mod.	. . .
				11–32	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	60–80	0.6–2.0	.15–.19	6.6–7.8	Moderate	Low
				32–60	Loam	ML or CL	A-4 or A-6	90–100	85–95	60–75	0.6–2.0	.17–.19	7.4–8.4 (calc.)	Low to mod.	Low

[c] Organic materials (muck) are subject to extremely high volume changes due to compressibility and subsidence when drained.

TABLE 8 (cont.)

Symbol on map (1)	Soil name (2)	Depth to bedrock (3)	Depth to seasonal high water table (4)	Depth from surface (in.) (5)	Classification: USDA Texture (6)	Classification: Unified (7)	Classification: AASHO (8)	Percent passing sieve: No. 4 (9)	Percent passing sieve: No. 10 (10)	Percent passing sieve: No. 200 (11)	Permeability (in./hr.) (12)	Available water capacity (in./in. of soil) (13)	Reaction (pH) (14)	Shrink-swell potential (15)	Corrosion potential for concrete conduits (16)
412B 412C 412C2 412D2	Ogle silt loam		Greater than 5 feet	0–13	Silt loam to silty clay loam	CL	A-6	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				13–38	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.6–6.5	Moderate	Moderate
				38–60	Clay loam	CL	A-6	95–100	95–100	70–80	0.6–2.0	.14–.16	6.1–6.5	Moderate	Low
752C 752C2 752D2	Oneco silt loam	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–7	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Low to mod.	. . .
				7–37	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.15–.20	5.6–6.5	Mod. to high	Moderate
				37–41	Silty clay to clay	CH	A-7	100	100	90–95	.06–0.6	.08–.12	6.1–6.5	High	Low
				41–60	Limestone bedrock	. . .	. . .	. . .	. . .	. . .	Variable	. . .	Calcareous	. . .	. . .
415	Orion silt loam		1 to 2½ feet	0–34	Silt loam	ML or CL	A-4 or A-6	100	100	80–90	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	Low
				34–60	Silty clay loam to silt loam	CL or ML	A-6	100	100	80–90	0.6–2.0	.18–.22	6.6–7.3	Low to mod.	Low
76 W76	Otter silt loam		Less than 1 foot	0–60	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.20–.24	6.6–7.8	Low to mod.	Low
429B 429C 429C2 429D 429D2	Palsgrove silt loam	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Moderate	. . .
				11–37	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.1–6.0	Mod. to high	Moderate
				37–42	Clay	CH	A-7	90–95	90–95	70–95	.06–0.6	.08–.12	6.1–6.5	High	Low
				42–60	Limestone bedrock	. . .	. . .	. . .	. . .	. . .	Variable	. . .	Calcareous	. . .	. . .
221B 221C 221C2 221D2	Parr silt loam		Greater than 5 feet	0–14	Silt loam to loam	ML or CL	A-6 or A-4	100	100	85–95	0.6–2.0	.20–.23	5.6–6.5	Low	. . .
				14–36	Clay loam	CL	A-6 or A-7	100	100	70–80	0.6–2.0	.15–.19	5.6–7.3	Moderate	Moderate
				36–60	Silt loam to loam	ML or CL	A-4 or A-6	90–100	85–95	55–65	0.6–2.0	.17–.20	7.4–8.4 (calc.)	Low to mod.	Low
21B 21C 21C2 21D2	Pecatonica silt loam		Greater than 3 feet	0–10	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				10–60	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.14–.18	5.1–5.5	Moderate	Moderate
199A 199B 199C 199C2	Plano silt loam		Greater than 2½ feet	0–19	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	. . .
				19–60	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.14–.20	5.6–6.5	Moderate	Moderate
148A 148B 148C 148C2 148D2	Proctor silt loam		Greater than 2½ feet	0–14	Silt loam	ML or CL	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	5.6–6.0	Moderate	. . .
				14–42	Silty clay loam to clay loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.15–.18	5.6–6.5	Moderate	Moderate
				42–60	Silt loam, loam, and silty clay loam	CL or ML	A-6, A-4, or A-7	100	100	60–95	0.6–2.0	.14–.20	6.1–6.5	Moderate	Mod. to low
74 W74	Radford silt loam		1 to 2½ feet	0–29	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Low	Low
				29–60	Silty clay loam	CL	A-6 or A-7	100	100	90–100	0.6–2.0	.18–.20	7.4–7.8	Mod. to high	Low
743B 743C	Ridott silt loam	3 to 5 feet to shale	1½ to 2½ feet	0–11	Silt loam	CL	A-6	100	95–100	95–100	0.6–2.0	.22–.24	5.6–6.5	Moderate	. . .
				11–38	Silty clay loam	CL	A-6 or A-7	100	100	95–100	0.6–2.0	.18–.20	5.6–7.3	Mod. to high	Moderate
				38–60	Silty clay to clay shale bedrock	CL	A-6	95–100	95–100	75–95	Less than .2	.08–.12	7.4–8.4 (calc.)	High	Low
969D2 969E2	Rodman gravelly loam (Mapped only in complex with Casco series. See also Casco.)		Greater than 5 feet	0–7	Gravelly loam	ML	A-4	70–80	60–80	30–60	6.0–20.0	.10–.12	7.4–8.4 (calc.)	Low	. . .
				7–60	Gravel and sand	GP or SP	A-1	50–80	25–70	5–25	More than 20.0	.02–.04	7.4–8.4 (calc.)	Low	Low
279A 279B	Rozetta silt loam		Greater than 2½ feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.1–6.0	Low	. . .
				11–50	Silty clay loam	CL	A-7 or A-6	100	100	95–100	0.6–2.0	.19–.21	5.1–6.0	Moderate	Moderate
				50–60	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.21–.23	5.6–7.3	Low	Mod. to low
68	Sable silty clay loam		Less than 1 foot	0–15	Silty clay loam	CH, CL, or OH	A-7	100	100	95–100	0.6–2.0	.21–.23	6.6–7.8	High	. . .
				15–44	Silty clay loam	CL or CH	A-6 or A-7	100	100	95–100	0.6–2.0	.19–.21	7.4–7.8	Mod. to high	Low
				44–60	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.21–.23	7.4–8.4 (calc.)	Moderate	Low
107 W107	Sawmill silty clay loam		Less than 1 foot	0–26	Silty clay loam	CL, CH, or MH	A-7	100	100	90–100	0.6–2.0	.21–.23	6.1–7.3	High	Low
				26–60	Silty clay loam to silt loam	CL	A-6 or A-7	100	100	70–95	0.6–2.0	.19–.22	6.6–7.8	Mod. to high	Low

TABLE 8 (cont.)

Symbol on map (1)	Soil name (2)	Depth to bedrock (3)	Depth to seasonal high water table (4)	Depth from surface (in.) (5)	Classification: USDA Texture (6)	Classification: Unified (7)	Classification: AASHO (8)	Percent passing sieve: No. 4 (9)	Percent passing sieve: No. 10 (10)	Percent passing sieve: No. 200 (11)	Permeability (in./hr.) (12)	Available water capacity (in./in. of soil) (13)	Reaction (pH) (14)	Shrink-swell potential (15)	Corrosion potential for concrete conduits (16)
418C2 418D2	Schapville silt loam	1½ to 3 feet to shale	Greater than 2½ feet	0–8	Silt loam	ML or CL	A-6	100	100	70–90	0.6–2.0	.22–.24	6.6–7.3	Moderate	...
				8–22	Silty clay loam	CL	A-7	100	100	85–95	0.6–2.0	.18–.20	5.6–6.5	Mod. to high	Moderate
				22–60	Silty clay to clay shale bedrock	CL	A-6	95–100	95–100	75–95	Less than .2	.08–.11	7.0–8.4 (calc.)	High	Low
745B 745C 745C2 745D2	Shullsburg silt loam	1½ to 3 feet to shale	1½ to 2½ feet	0–11	Silt loam	ML or CL	A-6	100	100	95–100	0.6–2.0	.22–.24	6.6–7.3	Moderate	...
				11–28	Silty clay loam to silty clay	CL	A-7	100	100	85–95	0.2–0.6	.11–.16	6.6–7.8	Mod. to high	Low
				28–60	Silty clay to clay shale bedrock	CL	A-6	95–100	95–100	75–95	Less than .2	.08–.11	7.4–8.4 (calc.)	High	Low
504D2 504F2	Sogn silt loam	Less than 1 feet to limestone	Greater than 5 feet	0–7	Silt loam	ML or CL	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	7.4–8.4 (calc.)	Low to mod.	...
				7–60	Limestone bedrock	...	...	...	...	...	Variable	...	Calcareous	...	...
243A 243B 243C 243C2	St. Charles silt loam		Greater than 2½ feet	0–14	Silt loam	CL or ML	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	...
				14–41	Silty clay loam	CL	A-7 or A-6	100	100	95–100	0.6–2.0	.18–.24	4.5–5.0	Mod. to high	High
				41–60	Silt loam, clay loam, and sandy loam	SC, CL, or SM	A-6, A-4, or A-2	100	100	30–90	0.6–6.0	.12–.20	5.1–5.5	Mod. to low	Moderate
278	Stronghurst silt loam		1½ to 2½ feet	0–16	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.22–.24	6.1–7.3	Low to mod.	...
				16–60	Silty clay loam	CL	A-7 or A-6	100	100	90–100	0.6–2.0	.19–.21	5.6–7.8	Moderate	Moderate
36A 36B 36C 36C2 36D2	Tama silt loam		Greater than 2½ feet	0–19	Silt loam	CL or ML	A-6	100	100	95–100	0.6–2.0	.22–.24	5.6–7.3	Low to mod.	...
				19–55	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.19–.21	5.1–6.5	Moderate	Moderate
				55–60	Silt loam	CL	A-6	100	100	95–100	0.6–2.0	.20–.22	6.1–6.5	Mod. to low	Low
206	Thorp silt loam		Less than 1½ feet	0–20	Silt loam	CL or ML	A-6 or A-7	100	100	95–100	0.6–2.0	.22–.24	5.6–6.5	Moderate	...
				20–40	Silty clay loam to clay loam	CL or ML	A-6 or A-7	100	100	70–95	.06–0.2	.15–.20	5.6–6.0	Mod. to high	Moderate
				40–60	Loamy sand, sandy loam, and sandy clay loam	SM, SC, ML, or CL	A-2, A-4, or A-6	100	100	15–55	0.6–6.0	.09–.15	6.1–6.5	Low to mod.	Low
223C 223C2 223D2	Varna silt loam		Greater than 2½ feet	0–13	Silt loam	CL or ML	A-6	100	100	70–90	0.6–2.0	.22–.24	6.1–6.5	Moderate	...
				13–38	Silty clay loam to silty clay	CL or CH	A-7	100	100	85–95	0.2–0.6	.11–.18	6.1–7.8	Mod. to high	Low
				38–60	Silty clay loam	CL	A-7	100	100	85–95	0.2–0.6	.18–.20	7.4–8.4 (calc.)	Mod. to high	Low
104A 104B	Virgil silt loam		1½ to 2½ feet	0–13	Silt loam	CL or ML	A-4 or A-6	100	100	95–100	0.6–2.0	.22–.24	5.1–7.3	Low to mod.	...
				13–49	Silty clay loam	CL	A-7	100	100	95–100	0.6–2.0	.19–.21	5.1–6.0	Moderate	Moderate
				49–60	Loam, clay loam, and sandy loam	SC, CL, or SM	A-6, A-4, or A-2	100	100	30–80	0.6–6.0	.16–.19	6.6–7.8	Mod. to low	Low
290C2 290D2	Warsaw silt loam		Greater than 5 feet	0–10	Silt loam to silty clay loam	CL or ML	A-6 or A-4	100	100	70–90	0.6–2.0	.22–.24	6.6–7.3	Low	...
				10–32	Clay loam to gravelly clay loam	CL	A-6	85–100	75–90	55–85	0.6–2.0	.15–.19	6.1–7.3	Moderate	Low
				32–60	Gravel and sand	GP or GW	A-1	40–80	30–70	0–10	6.0–20.0	.02–.04	7.4–8.4 (calc.)	Low	Low
22C2 22D2 22D3 22E2	Westville silt loam and Westville soils		Greater than 5 feet	0–11	Silt loam	ML or CL	A-4 or A-6	100	100	90–100	0.6–2.0	.22–.24	5.6–6.5	Low to mod.	...
				11–39	Silty clay loam to clay loam	CL	A-6 or A-7	95–100	90–100	70–95	0.6–2.0	.15–.20	5.6–6.0	Moderate	Moderate
				39–60	Gravelly clay loam to gravelly sandy clay loam, and sandy loam	SC, CL, or SM	A-6, A-4, or A-2	75–100	75–85	30–75	0.6–6.0	.12–.17	5.6–6.5	Mod. to low	Moderate
410B 410C 410C2 410D 410D2 410D3 410E2	Woodbine silt loam and Woodbine soils	3 to 5 feet to limestone or residuum	Greater than 5 feet	0–12	Silt loam and silty clay loam	ML or CL	A-6 or A-4	100	100	95–100	0.6–2.0	.22–.24	5.6–6.5	Low to mod.	...
				12–37	Silty clay loam, clay loam, and sandy loam	SC, CL, or SM	A-6, A-4, or A-2	100	100	30–80	0.6–6.0	.14–.19	5.1–6.0	Mod. to low	Moderate
				37–40	Cherty clay	CH	A-7	80–100	75–90	70–90	.06–0.6	.08–.10	5.6–6.0	High	Moderate
				40–60	Limestone bedrock	...	...	...	...	...	Variable	...	Calcareous	...	...

way subgrade. The AASHO Classification System was used to make the general ratings: A-1, very good; A-2, good to fair depending on the characteristics of the soil binder; A-3, good if soil binder is added; A-4, fair; A-6, poor; A-7, very poor. The most desirable soil material is gravel or gravel mixed with a moderate amount of sand; it is affected the least by adverse weather conditions and can be worked during a greater number of months of the year. The least desirable materials are clays or organic materials. The major soil features considered in evaluating the soils for subgrade are shear strength, compressibility, workability, shrink-swell potential, bearing capacity, and compaction characteristics. Other factors considered are stability, erosiveness, depth to water table, moisture content, and presence of stones or boulders.

Column 5. The "Highway location" column lists those soil features and qualities of the soil in place that affect the overall performance of the soil for the geographic location of a highway route. The entire soil profile is evaluated, based on an undisturbed soil without artificial drainage. It is assumed that the surface soil, because of its higher organic matter content, is removed in construction and used for topsoil. The major soil factors considered in evaluating the soils for highway location in Stephenson County refer only to soil features that are applicable to the specific soil and are as follows: presence and thickness of organic material, depth to bedrock, high water table frequency, degree of susceptibility to frost heave, erodibility of unvegetated slopes, flooding or ponding hazard, topography, ease of excavation and vegetation, traction of road equipment, hazards of very steep slopes, likelihood of seepage in cuts, and plasticity of the material.

Column 6. The "Foundations for low buildings" column rates the soil zone that provides the base for supporting foundations of low buildings (less than three stories high). Normally, the zone to be rated lies below the frostline, or 2½ to 3 feet deep. Where the entire solum does not extend below 2½ to 3 feet, only the substratum was rated. Some sola extend below 4 to 5 feet; substrata lying at greater depths were not rated. In some soils, where foundations are placed in lower solum material and in substrata, ratings were made for both. General suitability ratings, based on the Unified Classification System, were evaluated as slight, moderate, or severe, depending on the soil bearing capacity, shrink-swell potential, and shear strength. Qualifying ratings for each feature are indicated. Frequency of high water table is stated for applicable soils. Depth to bedrock is given for soils where limestone or residuum lies at less than 5 feet.

Column 7. The "Sewage lagoon disposal systems" column rates the soil as having slight, moderate, or severe limitations for lagoons. The major characteristics used to determine the rating limitations are permeability and land slope. Depth range to bedrock, organic matter percentage, and flooding or ponding hazard are mentioned for applicable soils. Statements concerning contamination of nearby water supplies are made for appropriate soils.

Column 8. The "Septic tank sewage disposal systems" column rates the soil as having slight, moderate, or severe limitations for septic tank filter fields. The major characteristics used to determine the rating limitations are permeability and land slope. Depth range to bedrock, high water table frequency, and flooding or ponding hazard are mentioned for applicable soils, as are evaluations of potential for pollution and effluent seepage on slopes.

Column 9. The "Reservoir area" column indicates those features and qualities of undisturbed soils that affect their suitability for water impoundments or reservoirs for farm ponds. Important factors affecting the seepage rate are permeability, expressed in terms of seepage, and depth to bedrock or other unfavorable material. A soil having a permeability rate of 2.0 to 6.0 inches per hour is expected to have a moderately rapid seepage rate; a soil having 0.06 to 0.2 inches per hour permeability rate is expected to have a slow seepage rate. High water table frequency is mentioned for soils that have poor or somewhat poor internal drainage. Statements concerning seepage rates for dug ponds are given for the nearly level soils.

Column 10. The "Embankments" column evaluates those features and qualities of disturbed soils that affect their suitability for constructing farm pond embankments. Evaluations for sola below the surface layer and for substrata were made where soil characteristics are contrasting and have significant thickness for use as borrow. Substrata were not evaluated where the sola commonly extend below 5 feet. Sola below the surface layer and substrata that were not significantly contrasting were evaluated collectively. The Unified Classification System was used for evaluating the soils in terms of their compacted seepage rate, stability, compaction character, resistance to piping, and shrink-swell potential. Evaluations were not made for materials that have a high seepage rate even when compacted.

Column 11. The "Agricultural drainage" column states those features and qualities of the soil that affect the installation and performance of surface and subsurface drainage practices. The major soil features considered to affect drainage for poorly and somewhat poorly drained soils are high water table frequency and permeability. Depth to bedrock and flooding are mentioned for applicable soils. General feasibility for tiling or surface drainage, based on soil characteristics, is given in terms of the soil's response to those practices. Operational drainage systems are entirely dependent upon adequate outlets. Soils that normally occupy flood plains are considered to have adequate outlets. General feasibility for tiling or surface drainage for upland and terrace soils is qualified as to outlet availability. Soils moderately well and well internally drained are considered to have adequate natural drainage.

Column 12. The "Irrigation" column evaluates or indicates those features or qualities of the soil that affect its suitability for irrigation. The major soil features considered are water-intake rate (rapid, medium, or slow, depending on the soils' overall texture) and available water capacity (low, moderate, or high, depending on the soils' measured or estimated ability to retain water). Depth of soil, as affecting root penetration; susceptibility to water and wind erosion; frequency of high water table, as an indication of the need for drainage; susceptibility to stream overflow; and natural high lime content are mentioned for applicable soils. Topography is not listed as a factor in the "Irrigation" column, but Column 1, "Soil series and map symbol," gives an indication of topography by the slope letter following the soil name number. Topography is more important for a gravitational irrigation system than for sprinkler irrigation.

Column 13. The "Terraces and diversions" column states those features and qualities of the soils that affect their suitability for terraces and diversions. The main soil features considered are depth to bedrock or other unfavorable material, steepness and uniformity of slope, and texture and organic matter content (as related to the ease of working less favorable exposed material). Less prevalent features, such as potential of channel accumulation from wind erosion, susceptibility of wet channels, and presence of boulders, stones, and chert, are given consideration where appropriate. Soils having rapid infiltration and permeability are not considered as having a water erosion hazard, and interpretations for terraces and diversions are not given for them. In most places, terraces and diversions are not needed on nearly level soils, but diversion construction and layout interpretations are given for soils that must accommodate nearby hill water. Soil feature interpretations are not given for vegetative practices that reduce or curb wind erosion; however, the conservation engineer can refer to Column 12, "Irrigation," and Column 14, "Grassed waterways," to determine the soils' physical features when planning a wind-erosion control program.

Column 14. The "Grassed waterways" column includes those features and qualities of the soils that affect their suitability for grassed waterways. The major soil features considered when conditions were other than favorable are natural internal drainage, texture and depth of soil material, available water-holding capacity, and tilth (as affected by exposure of subsoil or substrata). Less prevalent features, such as susceptibility to wind erosion accumulation, susceptibility of waterways to remain wet for long periods following rains, and hazards of construction and establishing vegetation on very steep slopes, are given consideration where applicable. In most places waterways are not needed on nearly level soils, but the feasibility of surface ditches to accommodate the water from a nearby waterway is mentioned where appropriate.

SOIL TEST DATA

Soil test data are reported in Table 10 (page 118) for five Stephenson County soils. These soils were sampled at locations selected as representative of each soil series. The tests were made by the Illinois Division of Highways, Bureau of Materials. Not all horizons of each soil profile were sampled; therefore, the samples do not represent the complete range of soil characteristics for the five soil series. However, these test results, along with test data from soils in other counties, were useful as a general guide for estimating the engineering properties of other soil series in Stephenson County.

FORMATION AND CLASSIFICATION OF STEPHENSON COUNTY SOILS

Factors of Soil Formation

Those who have tilled the soil of Stephenson County and most individuals who have observed its differing landscapes appreciate the fact that soil properties in the county differ from place to place. We continually strive to learn how soils differ, why they differ, and the importance of these differences in regard to the behavior and management requirements of soils for the variety of uses we make of them.

Soils are the result of the action of numerous chemical, physical, and biological processes. These processes are controlled or conditioned by a group of soil-forming factors: the nature of the soil parent materials; climatic characteristics, especially rainfall and temperature; the kind of plant and animal life associated with the soil, especially the native vegetation; the topography or slope of the land surface, particularly as it influences the moisture condition of the soil and its natural drainage; and the amount of time soil-development processes have been active and the rate or intensity of these processes. These major factors of soil formation, acting in various combinations, account for the differences among soils. These factors and their influence on soils of Stephenson County are discussed in the following sections.

PARENT MATERIAL

The major parent materials of Stephenson County are loess and glacial drift deposited as the result of glacial activity in the area.

Loess, the dominant parent material, is a wind-blown deposit, high in silt content, which was blown from the flood plains of the major streams. This silty material was deposited on flood plains by melt-water of the glaciers and was blown onto the uplands during and after the retreat of the glaciers. The loess deposits of

(Text resumes on page 120.)

TABLE 9. — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Argyle silt loam (227B, 227C, 227C2, 227D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable in most places; mixed sand and gravel occur below 5 feet in some areas.	Subsoil is poor to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate limitations in substratum — fair bearing capacity; low to moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Ashdale silt loam (411B, 411C, 411C2, 411D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is very poor; substratum is limestone bedrock, very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; gently to strongly sloping topography; some cuts will expose limestone bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; subsoil is plastic.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability, but bedrock occurs at 3 to 5 feet; some slopes exceed 7 percent; contamination through limestone crevices is a hazard.
Atlas silt loam (part of Fishhook-Atlas complex, 971C2, 971D2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is very poor to poor.	Occasional high water table; high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; seepage likely in cuts; subsoil is highly plastic.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate to severe limitations — very slow to slow permeability, but slopes range from 4 to 12 percent. Most of material is high in clay and plastic.
Atterberry silt loam (61A, 61B)	Surface is good to fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is fair to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to gently sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate limitations in substratum — fair to poor bearing capacity; moderate to low shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate limitations — moderate to moderately slow permeability; slopes range from 0 to 4 percent.
Batavia silt loam (105A, 105B, 105C)	Surface is good. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; topography is nearly level to moderately sloping; unvegetated slopes are erosive; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; low to moderate shrink-swell potential; fair shear strength. Slight to moderate limitations in substratum — good to poor bearing capacity.; low shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability.
Birkbeck silt loam (233B, 233C2, 233D2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is poor to fair.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently sloping to strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil and substratum — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderate permeability, but bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in silty material; limestone bedrock occurs at 3 to 5 feet; water is lost as it seeps along bedrock fractures.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 3 to 5 feet above the limestone bedrock. Overlying silty material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — very slow to slow permeability; effluent seepage on slopes likely.	Slow to very slow seepage rate; occasional high water table.	Clayey subsoil material commonly extends below 5 feet — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Occasional high water table; slow to very slow permeability; slopes from 4 to 12 percent — specially designed drainage systems needed in most places.	Slow water-intake rate; clayey subsoil; moderate available water capacity; occasional high water table; slopes highly susceptible to severe water erosion.	Less than 2 feet to silty clay subsoil; construction exposes clayey subsoil difficult to work and low in organic matter content; most channels remain wet long after rains.	Somewhat poorly drained clayey subsoil material; moderate available water capacity; in most places construction exposes clayey subsoil difficult to work and vegetate; most waterways remain wet long after rains.
Moderate limitations — moderate to moderately slow permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam substratum — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate to low shrink-swell potential.	Occasional high water table; moderate permeability; tile functions satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high available water capacity; occasional high water table.	Erosion not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to gently sloping topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 7-percent slopes.	Moderate seepage rate.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; low to moderate shrink-swell potential. Loamy substratum — moderate to low seepage rate when compacted; fair to poor stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to water erosion.	Soil features favorable for construction. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silty clay loam substratum — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate shrink-swell potential.	Soil is well and moderately well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Calamine silt loam (746B)	Surface is fair. Subsoil is poor — clayey; frequent high water table.	Not suitable; clay shale below 2 to 4 feet.	Subsoil and substratum are very poor.	2 to 4 feet to shale material; frequent high water table; high susceptibility to frost heave; nearly level to gently sloping topography; highly plastic subsoil and substratum.	Severe limitations in subsoil and substratum — fair bearing capacity; moderate to high shrink-swell potential; poor shear strength. Frequent high water table.	Slight to moderate limitations — moderate to very slow permeability, but slopes range up to 5 percent in some places; embankment material is mostly high in clay and plastic.
Camden silt loam and Camden soils (134B, 134C, 134C2, 134D2, 134D3, 134E2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is fair to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to very strongly sloping topography; mostly plastic subsoil material.	Moderate to slight limitations in subsoil — fair to good bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate limitations in the substratum — fair to poor bearing capacity; low shrink-swell potential; fair to poor shear strength.	Moderate limitations — moderate permeability: Severe limitations on slopes over 7 percent.
Casco-Fox complex (972C2, 972D2, 972E2)	Interpretations for Casco and Fox soils are given separately.					
Casco silt loam (part of Rodman-Casco complex, 969D2, 969E2; and part of Casco-Fox complex, 972C2, 972D2, 972E2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work; gravel and stones likely.	Good for gravel; about 2 feet or less of overburden in most places.	Subsoil is poor to very poor; substratum is very good.	Large stones and boulders in some places; moderate to high susceptibility to frost action in upper 1 to 2 feet; unvegetated slopes are erosive; topography is moderately to very strongly sloping; cuts expose gravel difficult to vegetate; large boulders and stones hinder excavation.	Slight limitations in gravelly substratum — good bearing capacity; low shrink-swell potential; good shear strength; excavation will be difficult in some places.	Severe limitations — moderate permeability; most slopes exceed 7 percent; danger of contamination through underlying gravel.
Catlin silt loam (171B, 171C, 171C2, 171D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil and substratum are poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil and substratum — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Coatsburg silt loam (part of Keller-Coatsburg complex, 970C2, 970D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor to poor.	Occasional high water table; high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; seepage likely in cuts; highly plastic subsoil material.	Severe limitations — fair bearing capacity; high to moderate shrink-swell potential; poor to fair shear strength. Occasional high water table.	Moderate to severe limitations — very slow to slow permeability, but slopes range from 4 to 12 percent. Most material is high in clay and plastic.
Derinda silt loam and Derinda soils (417C2, 417D2, 417D3, 417E2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil is clayey and difficult to work.	Not suitable; clay shale occurs at about 1½ to 3 feet.	Subsoil and substratum are very poor.	1½ to 3 feet to shale material; high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to very strongly sloping topography; seepy areas likely in cuts; most cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations in subsoil and substratum — fair bearing capacity; high shrink-swell potential; poor to fair shear strength.	Severe limitations — slow permeability, but most slopes exceed 7 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Severe limitations — moderate to very slow permeability; soil material is mostly high in clay and plastic; frequent high water table.	Moderately slow seepage rate in upper clayey material; very slowly permeable clay shale lies at 2 to 4 feet; frequent high water table.	Silty clay loam to silty clay subsoil and silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Frequent high water table; moderate to very slow permeability; slopes range from 1 to 5 percent — specially designed drainage systems needed in most places.	Most favorable rooting area limited to the 2 to 4 feet above shale bedrock. Overlying clayey material has slow water-intake rate; high available water capacity; frequent high water table.	Predominantly nearly level topography — terraces not needed in most places. Construction of diversions to accommodate nearby hill water exposes clayey material difficult to work and vegetate.	Predominantly nearly level topography — waterways not needed. Excavation for surface ditches to accommodate water from nearby grassed waterways exposes clayey material.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes. Severe limitations on 12- to 18-percent slopes.	Moderate seepage rate.	Silty clay loam to clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam and loam substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Moderate limitations on 4- to 12-percent slopes — moderate permeability. Severe limitations on slopes over 12 percent. Pollution is a hazard through underlying gravel.	Moderately rapid seepage rate in about upper 1 to 2 feet; underlying gravel permits rapid seepage.	Subsoil layer too thin in most places to use as borrow. Substratum is loose sand and gravel — rapid seepage rate even when compacted.	Soil is well to somewhat excessively drained; natural drainage is adequate.	Most favorable rooting area limited to about the upper 1 to 2 feet above calcareous sand and gravel. Overlying material has medium water-intake rate and low available water capacity; slopes susceptible to water erosion.	1 to 2 feet to calcareous sand and gravel; gravel and stones likely; some slopes exceed 12 percent; in most places construction exposes gravel difficult to work and vegetate.	Shallow, well-drained to somewhat excessively drained silty or loamy material over calcareous sand and gravel; low available water capacity; gravel and stones likely; in most places construction exposes gravel difficult to work and vegetate.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam subsoil and substratum — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — very slow to slow permeability; effluent seepage likely on slopes.	Slow to very slow seepage rate. Occasional high water table.	Clayey subsoil material commonly extends below 5 feet — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; high to moderate shrink-swell potential.	Occasional high water table; slow to very slow permeability; slopes range from 4 to 12 percent — specially designed drainage systems needed in most places.	Slow water-intake rate; clayey subsoil; moderate available water capacity; occasional high water table; slopes highly susceptible to severe water erosion.	Less than 2 feet to silty clay subsoil; construction exposes clayey subsoil difficult to work and low in organic matter content; most channels remain wet long after rains.	Poorly drained clayey subsoil material; moderate available water capacity; in most places construction exposes clayey subsoil difficult to work and vegetate; most waterways remain wet long after rains.
Severe limitations — slow permeability; soil material is mostly fine textured and plastic; effluent seepage on slopes likely.	Slow seepage rate in about upper 1 to 2 feet; very slowly permeable clay shale lies at 1½ to 3 feet.	Silty clay loam to silty clay subsoil, silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate in most places.	Most favorable rooting area limited to the 1½ to 3 feet above shale bedrock. Overlying material has slow water-intake rate and low to moderate available water capacity; slopes susceptible to severe water erosion.	1½ to 3 feet to clay shale; some slopes exceed 12 percent; construction exposes clay shale difficult to work and vegetate.	Shallow, moderately well- and well-drained clayey material over shale bedrock; low to moderate available water capacity; construction exposes clay shale difficult to work and vegetate.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dickinson sandy loam (87B, 87C2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter and somewhat drouthy.	Good for sand; material too small for gravel; less than 3½ feet to loose sand.	Subsoil and substratum are good to fair.	Low to moderate susceptibility to frost heave; unvegetated areas subject to water and wind erosion; gently to moderately sloping topography; cuts expose drouthy sand difficult to vegetate.	Slight limitations in subsoil and substratum — good bearing capacity; low shrink-swell potential; good to fair shear strength.	Severe limitations — moderately rapid to rapid permeability and and danger of contamination.
Dodgeville silt loam (40C, 40C2, 40D2, 40E2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 1½ to 3 feet.	Subsoil is very poor to poor; substratum is limestone bedrock, very good when crushed.	1½ to 3 feet to limestone bedrock; moderate to high susceptibility to frost heave above bedrock; unvegetated slopes highly erosive; moderately to very strongly sloping topography; cuts will expose limestone bedrock difficult to vegetate; excavation will be difficult; highly plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; poor to fair shear strength. Limestone bedrock occurs at 1½ to 3 feet.	Severe limitations — moderate to moderately slow permeability in subsoil; limestone bedrock occurs at 1½ to 3 feet; slopes range from 4 to 18 percent. Contamination through limestone crevices is a hazard.
Dorchester silt loam (239)	Good to below 5 feet but material has high lime content.	Not suitable.	Fair to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level topography; subject to occasional flooding or ponding.	Moderate limitations — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability; subject to occasional flooding and ponding.
Dorchester silt loam, cobbly subsoil variant (578)	Good to about 2 feet but material has high lime content; underlying coarse material is unsuitable.	Possible source of mixed gravel, chert, and limestone fragments; about 2 to 3 feet of overburden in most places.	Fair to poor to about 2 feet; substratum is good to very good.	Occasional high water table; moderate to high susceptibility to frost heave in upper 2 feet; nearly level topography; limestone fragments and stones hinder excavation below about 2 feet; subject to occasional flooding.	Moderate limitations — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength. Slight limitations in cobbly substratum except excavation will be difficult below about 2 feet. Occasional high water table.	Severe limitations — moderate permeability in upper 2 to 3 feet, but coarse material below is rapidly permeable; subject to occasional flooding.
Downs silt loam (386A, 386B, 386C, 386C2, 386D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; nearly level to strongly sloping topography; unvegetated slopes highly erosive; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate limitations in substratum — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Drummer silty clay loam (152)	Surface is fair. Subsoil is poor — clayey; frequent high water table.	Not suitable.	Subsoil is very poor to poor; substratum is fair to poor.	Water table frequently high; high susceptibility to frost heave; nearly level topography; plastic surface and subsoil.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Moderate limitations in substratum — good to fair bearing capacity; low to moderate shrink-swell potential; fair to poor shear strength. Frequent high water table.	Moderate limitations — moderate permeability.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Slight limitations where there is no pollution hazard — moderately rapid to rapid permeability. Moderate limitations on 4- to 7-percent slopes.	Moderately rapid seepage rate.	Sandy loam subsoil — moderate to low seepage rate when compacted; fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential. Substratum is fine sand — rapid seepage rate even when compacted.	Soil is well to somewhat excessively drained; natural drainage is adequate.	Most favorable rooting area limited to the 2 to 3 feet above loose sand. Overlying sandy loam material has rapid water-intake rate and low available water capacity; susceptible to wind and water erosion.	Water erosion is not a severe hazard — moderately rapid to rapid permeability. 2 to 3 feet to loose sand; deep cuts expose loose sand difficult to vegetate; channels subject to accumulation from wind erosion.	Moderately deep, well- to somewhat excessively drained sandy loam material over loose sand; low available water capacity; in some places construction exposes loose sand difficult to vegetate; subject to accumulation from wind erosion.
Severe limitations — moderate to moderately slow permeability in subsoil but limestone bedrock occurs at 1½ to 3 feet and some slopes exceed 12 percent. Pollution through limestone crevices is a hazard.	Moderate seepage rate in silty material; limestone bedrock occurs at 1½ to 3 feet — water is lost as it seeps along bedrock fractures.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 1½ to 3 feet above the limestone bedrock. Overlying silty material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	1½ to 3 feet to limestone bedrock; some slopes exceed 12 percent; construction in most places exposes bedrock and residuum — exposed bedrock difficult to work and vegetate.	Moderately deep, well-drained silty material over limestone bedrock; moderate available water capacity; construction in some places exposes bedrock and residuum difficult to work and vegetate.
Moderate limitations — moderate permeability; occasional high water table. Severe limitations where occasional flooding and ponding are a hazard.	Moderate seepage rate; occasional high water table; dug ponds have moderate seepage even after compaction.	Silty material — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	High lime content; medium water-intake rate; very high available water capacity; occasional high water table; susceptible to stream overflow.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Moderate limitations — occasional high water table; moderate permeability above 2 to 3 feet; rapid permeability in coarse material below; pollution is a hazard in some places. Severe limitations where occasional ponding and flooding are a hazard.	Moderate seepage rate in upper 2 to 3 feet; underlying cobbly material permits rapid seepage; occasional high water table.	Silty material — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential. Substratum is mostly cobbly material — rapid seepage rate even when compacted.	Occasional high water table; moderately permeable silty material; rapidly permeable cobbly substratum; cobbly material hinders tile installation in most places; subject to stream overflow.	High lime content; most favorable rooting area limited to the 2 to 3 feet above cobbly substratum. Overlying silty material has medium water-intake rate and moderate to high available water capacity. Occasional high water table; susceptible to stream overflow.	Nearly level topography — terraces not needed. Construction of diversions to accommodate nearby hill water exposes cobbly material in some places.	Nearly level topography — waterways not needed. Excavation for surfaces ditches to accommodate nearby grassed waterways exposes cobbly material in some places.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderate permeability, but frequent high water table.	Moderate seepage rate; frequent high water table; compacted dug ponds have low seepage rate if silty clay loam material is used to cover bottom of reservoir.	Silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Loamy substratum — moderate to low seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; low to moderate shrink-swell potential.	Frequent high water table; moderate permeability — tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high available water capacity; frequent high water table.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dubuque silt loam (29C, 29C2, 29D, 29D2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 1½ to 3 feet.	Subsoil is very poor to poor; substratum is limestone bedrock, very good when crushed.	1½ to 3 feet to limestone bedrock; moderate to high susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; moderately to strongly sloping topography; cuts will expose limestone bedrock difficult to vegetate; excavation will be difficult; highly plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Limestone bedrock occurs at 1½ to 3 feet.	Severe limitations — moderate to moderately slow permeability in subsoil; limestone bedrock occurs at 1½ to 3 feet; slopes range from 4 to 12 percent. Contamination through limestone crevices is a hazard.
Dubuque and Dunbarton silt loams and silty clay loams (973D3, 973E2, 973E3, 973F2)	Interpretations for Dubuque and Dunbarton soils are given separately. Dunbarton soils are not mapped individually and therefore are not assigned a specific number; they appear on the maps only in a combination with Dubuque soils that is assigned the 973 number.					
Dunbarton silt loam and silty clay loam (part of Dubuque and Dunbarton, 973D3, 973E2, 973E3, 973F2)	Subsoil and eroded slopes are poor — low in organic matter; clayey; subsoil material difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing at less than 2 feet.	Subsoil is very poor to poor; substratum is limestone bedrock, very good when crushed.	1 to 2 feet to limestone bedrock; moderate to high susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; strongly sloping to steep topography; cuts will expose limestone bedrock difficult to vegetate; use of power machinery hazardous on steep slopes; excavation will be difficult; highly plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; high shrink-swell potential; poor to fair shear strength. Limestone bedrock occurs at 1 to 2 feet.	Severe limitations — moderate to slow permeability in subsoil; limestone bedrock occurs at 1 to 2 feet; all slopes exceed 7 percent. Contamination through limestone crevices is a hazard.
Durand silt loam (416B, 416C, 416C2, 416D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable above 5 feet in most places. Gravelly material below 5 feet in some places.	Subsoil is poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Edgington silt loam (272)	Surface is fair. Subsoil is poor — low in organic matter; clayey; difficult to work; frequent high water table.	Not suitable.	Subsoil is very poor; substratum is fair to poor.	Water table frequently high; moderate to high susceptibility to frost heave; nearly level to depressional topography; plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; poor to fair shear strength. Moderate limitations in substratum — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength. Frequent high water table.	Slight limitations — moderately slow to slow permeability; no limiting factors.
Elburn silt loam (198A, 198B)	Surface is good. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is good to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to gently sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Slight limitations in substratum — good to fair bearing capacity; low to moderate shrink-swell potential; fair to good shear strength. Occasional high water table.	Moderate limitations — moderate permeability; slopes range from 0 to 4 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Severe limitations — moderate to moderately slow permeability in subsoil, but limestone bedrock occurs at 1½ to 3 feet. Pollution through limestone crevices is a hazard.	Moderate seepage rate in silty material; limestone bedrock occurs at 1½ to 3 feet; water is lost as it seeps along bedrock fractures.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 1½ to 3 feet above limestone bedrock. Overlying silty material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	1½ to 3 feet to limestone bedrock; in most places construction exposes bedrock and residuum difficult to work and vegetate.	Moderately deep, well-drained silty material over limestone bedrock; moderate available water capacity; in some places construction exposes bedrock and residuum difficult to work and vegetate.
Severe limitations — moderate to slow permeability in the subsoil; limestone bedrock occurs at 1 to 2 feet; most slopes exceed 12 percent. Pollution through limestone crevices is a hazard.	Moderately slow seepage rate in clayey material; limestone bedrock occurs at 1 to 2 feet; water is lost as it seeps along bedrock fractures.	Predominantly silty clay to clay subsoil — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 1 to 2 feet above limestone bedrock. Overlying clayey material has slow water-intake rate and low available water capacity; slopes susceptible to severe water erosion; some steep slopes.	1 to 2 feet to limestone bedrock; most slopes exceed 12 percent; construction exposes bedrock and residuum difficult to work and vegetate.	Shallow, well-drained clayey material over limestone bedrock; low available water capacity; construction exposes bedrock and residuum difficult to work and vegetate; some steep slopes.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil commonly extends below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderately slow to slow permeability; frequent high water table.	Moderately slow to slow seepage rate; frequent high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam to silty clay subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Silt loam substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Frequent high water table; moderately slow to slow permeability; tile function slowly. Surface inlets to tile will be beneficial if surface drainage is not practical.	Medium water-intake rate; high available water capacity; frequent high water table.	Nearly level topography — terraces not needed. Construction of diversions to accommodate nearby hill water in some places exposes clayey material difficult to work and vegetate.	Nearly level topography — waterways not needed. Excavation for surface ditches to accommodate water from nearby grassed waterways may expose silty clay material in some places.
Moderate limitations — moderate permeability but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Loamy substratum — low to moderate seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; low to moderate shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; high to very high available water capacity; occasional high water table.	Erosion is not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to gently sloping topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol (1)	Suitability as a source of: Topsoil (2)	Sand or gravel (3)	Highway subgrade material (4)	Soil features affecting suitability for engineering practices: Highway location (5)	Foundations for low buildings (6)	Sewage lagoon disposal systems (7)
Eleroy silt loam (547B, 547C, 547C2, 547D2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable; clay shale below 3 or 4 feet.	Subsoil is poor to very poor; substratum is very poor.	3 to 5 feet to shale material; moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; seepy areas likely in cuts; some cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Moderate limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Severe limitations in substratum — fair bearing capacity; high shrink-swell potential; poor shear strength.	Moderate to severe limitations — moderate permeability above shale; slopes range from 2 to 12 percent. Most of the material is high in clay and plastic.
Fayette silt loam and Fayette soils (280B, 280C, 280C2, 280D, 280D2, 280D3, 280E2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently sloping to steep topography; use of power equipment hazardous on steep slopes; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate limitations in substratum — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Fishhook-Atlas complex (971C2, 971D2)	Interpretations for Fishhook and Atlas soils are given separately.					
Fishhook silt loam (part of Fishhook-Atlas complex, 971C2, 971D2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is very poor to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; seepage likely in cuts; subsoil is highly plastic.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; poor to fair shear strength.	Moderate to severe limitations — slow permeability, but slopes range from 4 to 12 percent. Most of the material is high in clay and plastic.
Flagg silt loam (419B, 419C, 419C2, 419D2)	Surface is fair. Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Fox silt loam (part of Casco-Fox complex, 972C2, 972D2, 972E2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Good for gravel; about 2 to 3 feet of overburden in most places.	Subsoil is poor; Substratum is very good.	Moderate to high susceptibility to frost action in upper 2 to 3 feet; unvegetated slopes are erosive; moderately to very strongly sloping topography; cuts expose gravel difficult to vegetate; large boulders and stones hinder excavation; plastic subsoil material.	Slight to moderate limitations in subsoil — good to fair bearing capacity; moderate shrink-swell potential; fair shear strength. Slight limitations in gravelly substratum except excavation will be difficult in some places.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent; danger of contamination through underlying gravel.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems (8)	Farm ponds: Reservoir area (9)	Farm ponds: Embankments (10)	Agricultural drainage (11)	Irrigation (12)	Terraces and diversions (13)	Grassed waterways (14)
Severe limitations — silty material above shale is moderately permeable, but shale is slowly permeable; effluent seepage likely on slopes.	Moderate seepage rate in silty material; slowly permeable clay shale occurs at 3 to 5 feet.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate in most places.	Most favorable rooting area limited to the 3 to 4 feet above shale bedrock. Overlying silty material has medium water-intake rate and moderate to high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose shale bedrock in some places; exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes. Severe limitations on slopes over 12 percent.	Moderate seepage rate.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes exceed 12 percent. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — slow permeability; effluent seepage on slopes likely.	Moderate seepage rate in silty upper subsoil; slow seepage rate in lower, clayey subsoil.	Silty clay loam upper subsoil, and silty clay lower subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Soil is somewhat poorly drained. Moderately permeable in upper subsoil but slowly permeable in lower subsoil; slopes range from 4 to 12 percent — where natural drainage is inadequate, specially designed drainage systems are needed.	Most favorable rooting area limited to the 2 to 3 feet above clayey lower subsoil. Overlying silty material has medium water-intake rate and moderate to high available water capacity; slopes susceptible to severe water erosion.	About 2 to 3 feet to silty clay subsoil; in some places construction exposes clayey subsoil difficult to work and low in organic matter content; some channels remain wet long after rains.	Somewhat poorly drained subsoil material; moderate to high available water capacity; in some places construction exposes clayey subsoil difficult to work and vegetate; some waterways remain wet long after rains.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil commonly extends below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Moderate limitations on 4- to 12-percent slopes — moderate permeability. Severe limitations on slopes over 12 percent. Pollution is a hazard through underlying gravel.	Moderate seepage rate in upper 2 to 3 feet; underlying gravel permits rapid seepage.	Clay loam and gravelly clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate shrink-swell potential. Substratum is loose sand and gravel — rapid seepage rate even when compacted.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 2 to 3 feet above calcareous gravel. Overlying material has medium water-intake rate and moderate available water capacity; slopes susceptible to water erosion.	2 to 3 feet to calcareous sand and gravel; some slopes exceed 12 percent. Construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose gravel difficult to work and vegetate.	Moderately deep, well-drained silty or loamy material over calcareous sand and gravel; moderate available water capacity; deep cuts expose gravel difficult to work and vegetate.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Griswold loam (363D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable in most places.	Subsoil is poor; substratum is good to fair.	Moderate susceptibility to frost heave in upper 2 feet; unvegetated slopes erosive; strongly sloping topography; cuts expose calcareous sandy loam till difficult to vegetate.	Moderate limitations in subsoil — fair to good bearing capacity; moderate shrink-swell potential; fair to good shear strength. Slight limitations in substratum — good bearing capacity; low shrink-swell potential; good shear strength.	Severe limitations — all slopes exceed 7 percent.
Harpster silty clay loam (67)	Surface is fair. Subsoil is poor — clayey; frequent high water table; high lime content.	Not suitable.	Subsoil is poor to very poor; substratum is poor.	Water table frequently high; high susceptibility to frost heave; nearly level topography; material is plastic.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Frequent high water table.	Moderate limitations — moderate permeability.
Harvard silt loam (344A, 344B, 344C, 344C2, 344D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; nearly level to strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate to slight limitations in substratum — fair to good bearing capacity; moderate to low shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Hitt silt loam (506B, 506C, 506C2, 506D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is poor to very poor; substratum is limestone bedrock, very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above bedrock; unvegetated slopes highly erosive; gently to strongly sloping topography; some cuts expose limestone bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; poor to fair shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability, but bedrock occurs at 3 to 5 feet; some slopes exceed 7 percent; contamination through limestone crevices is a hazard.
Houghton muck (103, W103)	Poor when used alone — oxidizes readily and is erosive. Fair to good if mixed with mineral soil. Frequent high water table.	Not suitable.	Not suitable — organic material.	Muck greater than 4 feet thick; frequent high water table; high susceptibility to frost heave; subject to wind erosion if drained; subject to frequent ponding; nearly level to depressional topography; very unstable.	Severe limitations in muck — poor bearing capacity; high volume change because of compressibility and subsidence; poor shear strength. Frequent high water table.	Severe limitations — over 15 percent organic matter content; contamination is a hazard in some places. Subject to frequent ponding.
Huntsville silt loam (77)	Good to below 5 feet.	Not suitable.	Poor to fair.	Moderate to high susceptibility to frost heave; nearly level topography; subject to infrequent flooding.	Moderate limitations — fair to poor bearing capacity; moderate to low shrink-swell potential; fair to poor shear strength.	Moderate limitations — moderate permeability. Subject to infrequent flooding.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Moderate limitations — 7- to 12-percent slopes; material mostly sandy loam.	Moderate seepage rate in subsoil. Calcareous sandy loam till occurs at less than 4 feet and permits moderately rapid seepage.	Clay loam to sandy clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate shrink-swell potential. Sandy loam till substratum — moderate to low seepage rate when compacted; fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous sandy loam till. Overlying material has medium water-intake rate and moderate available water capacity; slopes susceptible to water erosion.	Less than 4 feet to calcareous sandy loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous sandy loam till difficult to vegetate.	Moderately deep, well-drained loamy material over calcareous sandy loam till; moderate available water capacity; deep cuts expose calcareous sandy loam till difficult to vegetate.
Severe limitations — moderate permeability, but frequent high water table.	Moderate seepage rate; frequent high water table; compacted dug ponds have low seepage rate if silty clay loam material is used to cover bottom of reservoir.	Silty clay loam subsoil and silt loam substratum — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Frequent high water table; moderate permeability — tile function satisfactorily in most places if outlets are obtained.	High lime content; medium water-intake rate; very high available water capacity; frequent high water table.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Predominantly silty clay loam subsoil and loam and fine sandy loam substratum — low to moderate seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderate permeability, but bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in silty and loamy material; limestone bedrock occurs at 3 to 5 feet; water is lost as it seeps along bedrock fractures.	Predominantly clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 3 to 5 feet above limestone bedrock. Overlying loamy material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — frequent high water table and frequent ponding. Pollution is a hazard in some places.	Muck — moderate seepage rate where water table is lowered; frequent high water table; turbid water likely in dug ponds.	Muck — not suitable for embankments.	Frequent high water table; muck to below 4 feet; moderate permeability; tile susceptible to settling out of alignment; if outlets are obtained, surface ditches work satisfactorily and can be blocked to control water level; subject to stream overflow and ponding.	Rapid water-intake rate; very high available water capacity; frequent high water table; susceptible to ponding and overflow; subject to wind erosion where water table is lowered.	Nearly level to depressional topography — terraces not needed. Topography in most places not suitable for constructing diversions to accommodate nearby hill water.	Nearly level to depressional topography — waterways not needed. Surface ditches work satisfactorily to accommodate nearby grassed waterways.
Slight to moderate limitations — moderate permeability. Subject to infrequent flooding.	Moderate seepage rate; dug ponds have low to moderate seepage rate after compaction.	Silty material — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate to low shrink-swell potential.	Soil is well and moderately well drained; natural drainage is adequate in most places; subject to infrequent flooding.	Medium water-intake rate; very high available water capacity; susceptible to infrequent flooding.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol (1)	Suitability as a source of: Topsoil (2)	Sand or gravel (3)	Highway subgrade material (4)	Soil features affecting suitability for engineering practices: Highway location (5)	Foundations for low buildings (6)	Sewage lagoon disposal systems (7)
Keller-Coatsburg complex (970C2, 970D2)	Interpretations for Keller and Coatsburg soils are given separately.					
Keller silt loam (part of Keller-Coatsburg complex, 970C2, 970D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; seepage likely in cuts; subsoil is highly plastic.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength.	Moderate to severe limitations — slow permeability but slopes range from 4 to 12 percent. Most of the material is high in clay and plastic.
Keltner silt loam (546B, 546C, 546C2, 546D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable; clay shale below 3 or 4 feet.	Subsoil is poor to very poor; substratum is very poor.	3 to 5 feet to shale material; moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; seepy areas likely in cuts; some cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Moderate limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Severe limitations in substratum — fair bearing capacity; high shrink-swell potential; poor shear strength.	Moderate to severe limitations — moderate permeability above shale; slopes range from 2 to 12 percent. Material is high in clay and plastic.
Kendall silt loam (242A, 242B)	Surface is fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is fair to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to gently sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Moderate to slight limitations in substratum — fair to good bearing capacity; moderate to low shrink-swell potential; fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability; slopes range from 0 to 4 percent.
Kidder loam and Kidder soils (361D2, 361D3)	Eroded slopes and subsoil are poor — subsoil material is low in organic matter; difficult to work.	Not suitable in most places.	Subsoil is poor; substratum is good to fair.	Moderate susceptibility to frost heave in upper 2 feet; unvegetated slopes highly erosive; strongly to very strongly sloping topography; cuts expose calcareous sandy loam till difficult to vegetate.	Moderate limitations in subsoil — good to fair bearing capacity; moderate shrink-swell potential; good to fair shear strength. Slight limitations in substratum — good bearing capacity; low shrink-swell potential; good to fair shear strength.	Severe limitations — all slopes exceed 7 percent.
Lawson silt loam (451)	Good to below 5 feet.	Not suitable.	Fair to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level topography; subject to occasional flooding or ponding.	Moderate limitations — poor to fair bearing capacity; moderate shrink-swell potential; poor to fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability; subject to occasional flooding and ponding.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Severe limitations — slow permeability; effluent seepage on slopes likely.	Moderate seepage rate in silty upper subsoil; slow seepage rate in lower, clayey subsoil.	Silty clay loam upper subsoil, and predominantly silty clay and silty clay loam lower subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Soil is somewhat poorly drained. Moderately permeable in upper subsoil but slowly permeable in lower subsoil; slopes range from 4 to 12 percent. Where natural drainage is inadequate, specially designed drainage systems are needed.	Most favorable rooting area limited to the 2 to 3 feet above clayey lower subsoil. Overlying silty material has medium water-intake rate and moderate to high available water capacity; slopes susceptible to severe water erosion.	About 2 to 3 feet to silty clay subsoil; in some places construction exposes clayey subsoil material difficult to work and low in organic matter content; some channels remain wet long after rains.	Somewhat poorly drained subsoil material; moderate to high available water capacity; in some places construction exposes clayey subsoil difficult to work and vegetate; some waterways remain wet long after rains.
Severe limitations — silty material above shale is moderately permeable, but shale is slowly permeable; effluent seepage likely on slopes.	Moderate seepage rate in silty material; slowly permeable clay shale occurs at 3 to 5 feet.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate in most places.	Most favorable rooting area limited to the 3 to 4 feet above shale bedrock. Overlying silty material has medium water-intake rate and moderate to high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose shale bedrock in some places; exposed silty clay loam subsoil and clay shale have less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Moderate limitations — moderate permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; moderate shrink-swell potential. Mostly silt loam and loam substratum — low to moderate seepage rate when compacted; fair to good stability and compaction character; good to poor resistance to piping; moderate to low shrink-swell potential.	Occasional high water table; moderate permeability — tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high to high available water capacity; occasional high water table.	Erosion not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to gently sloping topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Moderate limitations — 7- to 12-percent slopes; material mostly sandy loam.	Moderate seepage rate in subsoil. Calcareous sandy loam till occurs at less than 4 feet and permits moderately rapid seepage.	Sandy clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Sandy loam till substratum — moderate to low seepage rate when compacted; fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous sandy loam till. Overlying material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Less than 4 feet to calcareous sandy loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous sandy loam till difficult to vegetate.	Moderately deep, well-drained loamy material over calcareous sandy loam till; moderate available water capacity; deep cuts expose calcareous sandy loam till difficult to vegetate.
Moderate limitations — moderate permeability; occasional high water table. Severe limitations where occasional flooding and ponding are a hazard.	Moderate seepage rate; occasional high water table; dug ponds have low to moderate seepage after compaction.	Silty material — low to moderate seepage when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	Medium water-intake rate; very high available water capacity; occasional high water table; susceptible to stream overflow.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lena muck (210)	Poor when used alone — oxidizes readily and is erosive. Fair to good if mixed with mineral soil. Frequent high water table; high lime content.	Not suitable.	Not suitable — organic material.	Muck, greater than 4 feet thick; frequent high water table; high susceptibility to frost heave; subject to wind erosion if drained; subject to frequent ponding; nearly level to depressional topography; very unstable.	Severe limitations in muck — poor bearing capacity; high volume change because of compressibility and subsidence; poor shear strength. Moderate limitations in underlying loamy material — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength. Frequent high water table.	Severe limitations — over 15 percent organic matter content; contamination is a hazard in some places. Frequent high water table.
Loran silt loam (572B, 572C)	Surface is good. Subsoil is poor — low in organic matter; difficult to work.	Not suitable; clay shale below 3 or 4 feet.	Subsoil is poor to very poor; substratum is very poor.	3 to 5 feet to shale material; occasional high water table; moderate to high susceptibility to frost heave; gently to moderately sloping topography; seepy areas likely in cuts; some cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations in subsoil and substratum — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate limitations on 2- to 7-percent slopes; moderate permeability above shale, but shale is slowly permeable.
Massbach silt loam (753B, 753C, 753C2, 753D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable; clay shale below 3 or 4 feet.	Subsoil is poor to very poor; substratum is very poor.	3 to 5 feet to shale material; moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; seepy areas likely in cuts; some cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Moderate limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Severe limitations in substratum — fair bearing capacity; high shrink-swell potential; poor shear strength.	Moderate to severe limitations — moderate permeability above shale; slopes range from 2 to 12 percent. Most of the material is high in clay and plastic.
Miami silt loam and Miami soils (27C2, 27D2, 27D3, 27E2)	Subsoil and eroded slopes are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave in about upper 2 feet; unvegetated slopes highly erosive; moderately to very strongly sloping topography; cuts expose calcareous loam till difficult to vegetate.	Moderate limitations in subsoil and substratum — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Millbrook silt loam (219)	Surface is good to fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable in most places.	Subsoil poor to very poor; substratum good to fair.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level topography.	Moderate limitations in subsoil — fair to good bearing capacity; moderate shrink-swell potential; fair to good shear strength. Slight limitations in substratum — good bearing capacity; low shrink-swell potential; fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems (8)	Farm ponds: Reservoir area (9)	Farm ponds: Embankments (10)	Agricultural drainage (11)	Irrigation (12)	Terraces and diversions (13)	Grassed waterways (14)
Severe limitations — frequent high water table. Pollution is a hazard in some places.	Muck — moderate seepage rate where water table is lowered; frequent high water table; turbid water likely in dug ponds.	Muck — not suitable for embankments.	Frequent high water table; muck to below 4 feet; moderate permeability; tile susceptible to settling out of alignment; if outlets are obtained, surface ditches work satisfactorily and can be blocked to control water level; subject to stream overflow.	High lime content; rapid water-intake rate; very high available water capacity; frequent high water table; susceptible to overflow; subject to wind erosion where water table is lowered.	Nearly level to depressional topography — terraces not needed. In most places topography not suitable for construction of diversions to accommodate nearby hill water.	Nearly level to depressional topography — waterways not needed. Surface ditches work satisfactorily to accommodate nearby grassed waterways.
Severe limitations — moderate permeability above shale, but shale is slowly permeable; occasional high water table; slopes range from 2 to 7 percent; effluent seepage likely on slopes.	Moderate seepage rate in silty material; slowly permeable clay shale occurs at 3 to 5 feet; occasional high water table.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Occasional high water table; moderate to slow permeability; slopes range from 2 to 7 percent — specially designed drainage systems needed in most places.	Most favorable rooting area limited to the 3 to 4 feet above shale bedrock. Overlying silty material has medium water-intake rate; moderate to high available water capacity; occasional high water table; slopes susceptible to water erosion.	Soil features favorable for construction of conventional terraces. Cuts for parallel terraces expose shale bedrock in some places; exposed silty clay loam subsoil has less favorable tilth and low organic matter. Most channels remain wet long after rains.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation. Somewhat poorly drained subsoil; some waterways remain wet long after rains.
Severe limitations — silty material above shale is moderately permeable, but shale is slowly permeable; effluent seepage likely on slopes.	Moderate seepage rate in silty material; slowly permeable clay shale occurs at 3 to 5 feet.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate in most places.	Most favorable rooting area limited to the 3 to 4 feet above shale bedrock. Overlying silty material has medium water-intake rate and moderate to high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular; cuts for parallel terraces expose shale bedrock in some places; exposed silty clay loam subsoil and clay shale have less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Moderate permeability. Moderate limitations on 4- to 12-percent slopes. Severe limitations on slopes over 12 percent.	Moderate seepage rate.	Clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Calcareous loam till substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous loam till. Overlying material has medium water-intake rate and high available water capacity; slopes susceptible to severe water erosion.	2 to 3 feet to calcareous loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous loam till difficult to vegetate.	Moderately deep, well-drained loamy material over calcareous loam till; high available water capacity; deep cuts expose calcareous loam till difficult to vegetate.
Moderate limitations — moderate permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam to clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate shrink-swell potential. Mostly sandy loam substratum — moderate to low seepage rate when compacted; fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Occasional high water table; moderate permeability — tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; high available water capacity; occasional high water table.	Erosion not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Millington silt loam (82)	Good to below 5 feet; high lime content; frequent high water table.	Not suitable.	Poor to fair.	Frequent high water table; moderate to high susceptibility to frost heave; subject to frequent flooding; nearly level topography.	Moderate limitations — fair to poor bearing capacity; moderate to low shrink-swell potential; fair to poor shear strength. Frequent high water table.	Moderate limitations — moderate permeability. subject to frequent flooding.
Morley silt loam (194C, 194C2, 194D2, 194E2)	Surface is fair. Eroded slopes and subsoil are poor — low in organic matter; subsoil material difficult to work.	Not suitable.	Subsoil and substratum are very poor.	High susceptibility to frost heave; unvegetated slopes highly erosive; moderately to very strongly sloping topography; cuts expose calcareous silty clay loam material difficult to vegetate; highly plastic subsoil material.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; poor to fair shear strength.	Moderately slow to slow permeability. Moderate limitations on 4- to 7-percent slopes. Severe limitations on slopes over 7 percent.
Muscatine silt loam (41A, 41B)	Surface is good. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor; substratum is poor to fair.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to gently sloping topography; highly plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Moderate limitations in substratum — fair to poor bearing capacity; moderate shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate limitations — moderate permeability; slopes range from 0 to 4 percent.
Myrtle silt loam (414B, 414C, 414C2, 414D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Nasset silt loam (731B, 731C, 731C2, 731D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is poor to very poor; substratum is limestone bedrock, very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above bedrock; unvegetated slopes highly erosive, gently to strongly sloping topography; some cuts will expose limestone bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; subsoil is plastic.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability, but limestone bedrock occurs at 3 to 5 feet and some slopes exceed 7 percent; contamination through limestone crevices is a hazard.
Octagon silt loam (656C2, 656D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave in about upper 3 feet; unvegetated slopes highly erosive; moderately to strongly sloping topography; cuts expose calcareous loam till difficult to vegetate.	Moderate limitations in subsoil and substratum — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems (8)	Farm ponds: Reservoir area (9)	Farm ponds: Embankments (10)	Agricultural drainage (11)	Irrigation (12)	Terraces and diversions (13)	Grassed waterways (14)
Severe limitations — moderate permeability, but frequent high water table and frequent flooding.	Moderate seepage rate; frequent high water table; dug ponds have low to moderate seepage after compaction.	Silty and loamy material — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate to low shrink-swell potential.	Frequent high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	High lime content; medium water-intake rate; high available water capacity; frequent high water table; susceptible to stream overflow.	Nearly level topography — terraces not needed. In most places topography not suited for construction of diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Surface ditches work satisfactorily to accommodate nearby grassed waterways.
Severe limitations — moderately slow to slow permeability. Material is high in clay and plastic. Seepage on slopes is a hazard; some slopes exceed 12 percent.	Moderately slow seepage rate.	Silty clay loam subsoil and substratum — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous silty clay loam material. Overlying material has slow water-intake rate and high available water capacity; slopes susceptible to severe water erosion.	2 to 3 feet to calcareous silty clay loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous silty clay loam till difficult to work and vegetate.	Moderately deep, moderately well- and well-drained silty material over calcareous silty clay loam material; high available water capacity; deep cuts expose calcareous silty clay loam till difficult to work and vegetate.
Moderate limitations — moderate permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Silt loam substratum — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high available water capacity; occasional high water table.	Erosion not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to gently sloping topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil commonly extends below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderate permeability but bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in silty material; limestone bedrock occurs at 3 to 5 feet; water is lost as it seeps along bedrock fractures.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 3 to 5 feet above limestone bedrock. Overlying silty material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Calcareous loam till substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous loam till. Overlying material has medium water-intake rate and high available water capacity; slopes susceptible to severe water erosion.	2 to 3 feet to calcareous loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous loam till difficult to vegetate.	Moderately deep, well-drained loamy material over calcareous loam till; high available water capacity; deep cuts expose calcareous loam till difficult to vegetate.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ogle silt loam (412B, 412C, 412C2, 412D2)	Surface is good. Eroded slopes are fair to poor. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Oneco silt loam (752C, 752C2, 752D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is poor to very poor; substratum is limestone bedrock, very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above bedrock; unvegetated slopes highly erosive; moderately to strongly sloping topography; some cuts expose limestone bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; plastic subsoil material.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability, but bedrock occurs at 3 to 5 feet; some slopes exceed 7 percent; contamination through limestone crevices is a hazard.
Orion silt loam (415)	Good to fair to below 5 feet.	Not suitable.	Fair to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level topography; subject to occasional flooding.	Moderate limitations — fair to poor bearing capacity; moderate to low shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate limitations — moderate permeability. Subject to occasional flooding.
Otter silt loam (76, W76)	Good to below 5 feet; frequent high water table.	Not suitable.	Fair to poor.	Frequent high water table; moderate to high susceptibility to frost heave; subject to frequent flooding and ponding; nearly level to depressional topography.	Moderate limitations — poor to fair bearing capacity; low to moderate shrink-swell potential; poor to fair shear strength. Frequent high water table.	Moderate limitations — moderate permeability. Subject to frequent flooding and ponding.
Palsgrove silt loam (429B, 429C, 429C2, 429D, 429D2)	Surface is fair. Eroded slopes and subsoil are poor — low in organic matter; subsoil material difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is poor to very poor; substratum is limestone bedrock, very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; gently to very strongly sloping topography. Some cuts will expose limestone bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; subsoil is plastic.	Severe limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability but bedrock occurs at 3 to 5 feet; some slopes exceed 7 percent; contamination through limestone crevices is a hazard.
Parr silt loam (221B, 221C, 221C2, 221D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave in upper 3 feet; unvegetated slopes highly erosive; gently to strongly sloping topography; cuts expose calcareous loam till difficult to vegetate.	Moderate limitations in subsoil and substratum — fair bearing capacity; moderate to low shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Pecatonica silt loam (21B, 21C, 21C2, 21D2)	Surface is fair. Eroded slopes and subsoil are poor — low in organic matter; subsoil material difficult to work.	Not suitable in most places; mixed sand and gravel below 5 feet in some areas.	Poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; gently to strongly sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil commonly extends below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Most cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — moderate permeability but bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in silty and loamy material; limestone bedrock occurs at 3 to 5 feet; water is lost as it seeps along bedrock fractures.	Predominantly clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area is limited to the 3 to 5 feet above limestone bedrock. Overlying loamy material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose clay loam subsoil, causing difficult seedbed preparation.
Moderate limitations — moderate permeability; occasional high water table. Severe limitations where occasional flooding is a hazard.	Moderate seepage rate; occasional high water table; dug ponds have moderate to low seepage after compaction.	Silty material — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; moderate to low shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	Medium water-intake rate; very high available water capacity; occasional high water table; susceptible to stream overflow.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Severe limitations — moderate permeability but subject to frequent flooding and ponding.	Moderate seepage rate; frequent high water table; dug ponds have moderate to low seepage after compaction.	Silty material — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Frequent high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	Medium water-intake rate; very high available water capacity; frequent high water table; susceptible to stream overflow.	Nearly level to depressional topography — terraces not needed. In most places topography not suited for construction of diversions to accommodate nearby hill water.	Nearly level to depressional topography — waterways not needed. Surface ditches work satisfactorily to accommodate nearby grassed waterways.
Severe limitations — moderate permeability but limestone bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in silty material; limestone bedrock occurs at 3 to 5 feet. Water is lost as it seeps along bedrock fractures.	Mostly silty clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; gool resistance to piping; moderate to high shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 3 to 5 feet above limestone bedrock. Overlying silty material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Calcareous loam till substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous loam till. Overlying material has medium water-intake rate and high available water capacity; slopes susceptible to severe water erosion.	2 to 3 feet to calcareous loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous loam till difficult to vegetate.	Moderately deep, well-drained loamy material over calcareous loam till; high available water capacity; deep cuts expose calcareous loam till difficult to vegetate.
Slight to moderate limitations on 2- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil to below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol (1)	Suitability as a source of: Topsoil (2)	Sand or gravel (3)	Highway subgrade material (4)	Soil features affecting suitability for engineering practices: Highway location (5)	Foundations for low buildings (6)	Sewage lagoon disposal systems (7)
Plano silt loam (199A, 199B, 199C, 199C2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is fair.	Moderate to high susceptibility to frost heave; nearly level to moderately sloping topography; unvegetated slopes erosive; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability.
Proctor silt loam (148A, 148B, 148C, 148C2, 148D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is poor to fair.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; nearly level to strongly sloping topograpy; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Radford silt loam (74, W74)	Good to about 2 to 3 feet; fair to poor below about 3 feet.	Not suitable.	Poor to very poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to depressional topography; subject to occasional flooding and ponding.	Moderate limitations — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability. Subject to occasional flooding and ponding.
Ridott silt loam (743B, 743C)	Surface is good to fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable; clay shale below 3 or 4 feet.	Subsoil is poor to very poor; substratum is very poor.	3 to 5 feet to shale material; occasional high water table; moderate to high susceptibility to frost heave; gently to moderately sloping topography; seepy areas likely in cuts; some cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations in subsoil and substratum — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Occasional high water table.	Moderate permeability above shale, but shale is slowly permeable — moderate limitations on 2- to 7-percent slopes.
Rodman-Casco complex (969D2, 969E2)	Interpretations for Rodman and Casco soils are given separately.					
Rodman gravelly loam (part of Rodman-Casco complex, 969D2, 969E2)	Eroded slopes are poor — high lime content; low in organic matter; gravel and stones likely. Underlying gravel material is very poor.	Good for gravel.	Very good — all features favorable.	Large stones and boulders in most places; low susceptibility to frost action; slopes difficult to vegetate and subject to erosion; strongly sloping to steep topography; cuts expose gravel difficult to vegetate; large boulders and stones hinder excavation.	Slight limitations — good bearing capacity if confined; low shrink-swell potential; good shear strength; excavation will be difficult in most places.	Severe limitations — very rapid permeability; danger of contamination; slopes range from 7 to 30 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 7-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil to below 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; very high to high available water capacity; slopes susceptible to water erosion.	Soil features favorable for construction. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam and clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam, loam, and silty clay loam substratum — low to moderate seepage rate when compacted; fair to poor stability and compaction character; good to poor resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction. Exposed silty clay loam or clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam or clay loam subsoil, causing difficult seedbed preparation.
Moderate permeability; moderate limitations; occasional high water table. Severe limitations where occasional flooding and ponding are a hazard.	Moderate seepage rate; occasional high water table; dug ponds have low seepage after compaction.	Silt loam material to about 3 feet — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential. Silty clay loam below about 3 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily; subject to stream overflow.	Medium water-intake rate; very high available water capacity; occasional high water table; susceptible to stream overflow.	Nearly level to depressional topography — terraces not needed. In most places soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to depressional topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Severe limitations — moderate permeability above shale, but shale is slowly permeable; occasional high water table; slopes range from 2- to 7-percent; effluent seepage likely on slopes.	Moderate seepage rate in silty material; slowly permeable clay shale occurs at 3 to 5 feet; occasional high water table.	Predominantly silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Occasional high water table; moderate to slow permeability; slopes range from 2 to 7 percent — specially designed drainage systems needed in most places.	Most favorable rooting area limited to the 3 to 4 feet above shale bedrock. Overlying silty material has medium water-intake rate; moderate to high available water capacity; occasional high water table; slopes susceptible to water erosion.	Soil features favorable for construction of conventional terraces. Cuts for parallel terraces expose shale bedrock in some places; exposed silty clay loam subsoil has less favorable tilth and low organic matter content. Most channels remain wet long after rains.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation; somewhat poorly drained subsoil; some waterways remain wet long after rains.
Severe limitations on slopes over 12 percent — very rapid permeability. Pollution is a hazard in some places.	Less than 1 foot to calcareous gravel and sand; very rapid seepage rate.	Gravel material — very rapid seepage rate even when compacted.	Soil is excessively drained; natural drainage is adequate.	High lime content; very rapid water-intake rate; very low available water capacity; subject to water erosion.	Less than 1 foot to calcareous gravel and sand; gravel and stones in most places; some slopes exceed 12 percent; construction exposes calcareous gravel difficult to work and vegetate.	Very shallow, excessively drained gravelly loam material over calcareous gravel and sand; very low available water capacity; gravel and stones in most places; construction exposes calcareous gravel difficult to work and vegetate.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rozetta silt loam (279A, 279B)	Surface is fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is fair to poor.	Moderate to high susceptibility to frost heave; nearly level to gently sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability; slopes range from 0 to 4 percent.
Sable silty clay loam (68)	Surface is fair. Subsoil is poor — clayey; frequent high water table.	Not suitable.	Subsoil is poor to very poor; substratum is poor.	Water table frequently high; high susceptibility to frost heave; nearly level topography; clayey surface and subsoil are plastic.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength. Frequent high water table.	Moderate limitations — moderate permeability.
Sawmill silty clay loam (107, W107)	Surface is fair. Subsoil is poor — clayey; frequent high water table.	Not suitable.	Poor to very poor.	Frequent high water table; high susceptibility to frost heave; subject to frequent flooding and ponding; nearly level to depressional topography; clayey surface and subsoil are plastic.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Frequent high water table.	Moderate limitations — moderate to moderately slow permeability. Subject to frequent flooding and ponding.
Schapville silt loam (418C2, 418D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; clayey; difficult to work.	Not suitable; clay shale occurs at about 1½ to 3 feet.	Subsoil and substratum are very poor.	1½ to 3 feet to shale material; high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; seepy areas likely in cuts; most cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations in subsoil and substratum — fair bearing capacity; high shrink-swell potential; poor to fair shear strength.	Slow permeability — moderate limitations on 4- to 7-percent slopes; severe limitations on 7- to 12-percent slopes.
Shullsburg silt loam (745B, 745C, 745C2, 745D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; clayey; difficult to work.	Not suitable; clay shale below 1½ to 3 feet.	Subsoil and substratum are very poor.	1½ to 3 feet to shale material; occasional high water table; moderate to high susceptibility to frost heave; gently to strongly sloping topography; seepy areas likely in cuts; most cuts expose shale material difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations — fair bearing capacity; high shrink-swell potential; poor shear strength. Occasional high water table.	Moderate limitations on 2- to 7-percent slopes — slow permeability. Severe limitations on slopes over 7 percent.
Sogn silt loam (504D2, 504F2)	Surface is fair to poor — contains some stony material and is about 1 foot to limestone bedrock.	Not suitable for sand or gravel; good source of limestone for crushing.	Limestone bedrock, very good when crushed.	About 1 foot to limestone bedrock; moderate susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; strongly sloping to very steep topography; cuts very difficult to vegetate; use of power machinery is hazardous on steep and very steep slopes; excavation difficult.	Limestone bedrock at about 1 foot.	Severe limitations — moderate permeability in silty material, but limestone bedrock occurs at about 1 foot; all slopes exceed 7 percent. Contamination through limestone crevices is a hazard.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems (8)	Farm ponds: Reservoir area (9)	Farm ponds: Embankments (10)	Agricultural drainage (11)	Irrigation (12)	Terraces and diversions (13)	Grassed waterways (14)
Slight to moderate limitations — moderate permeability.	Moderate seepage rate.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Silt loam substratum — moderate to low seepage rate when compacted; poor to fair stability and compaction character; poor to good resistance to piping; low shrink-swell potential.	Soil is moderately well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity.	Some slopes are gently sloping; soil features favorable for construction and vegetation.	Soil features favorable for construction and vegetation.
Severe limitations — moderate permeability, but frequent high water table.	Moderate seepage rate; frequent high water table; compacted dug ponds have low seepage rate after compaction.	Silty clay loam subsoil and silt loam substratum — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Frequent high water table; moderate permeability; tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high available water capacity; frequent high water table.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Severe limitations — moderate to moderately slow permeability, but frequent high water table and frequent flooding and ponding.	Moderate seepage rate; frequent high water table; dug ponds have low seepage after compaction.	Silty clay loam to about 4 feet, silt loam below 4 feet — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Frequent high water table; moderate to moderately slow permeability; tile function satisfactorily; subject to stream overflow.	Medium water-intake rate; very high available water capacity; frequent high water table; susceptible to stream overflow.	Nearly level to depressional topography — terraces not needed. In most places soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to depressional topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Severe limitations — slow permeability; soil material is mostly high in clay and plastic; effluent seepage likely on slopes.	Slow seepage rate in upper 1 to 2 feet; slowly permeable clay shale occurs at 1½ to 3 feet.	Silty clay loam to silty clay subsoil, silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate in most places.	Most favorable rooting area limited to the 1½ to 3 feet above shale bedrock. Overlying material has slow water-intake rate and low to moderate available water capacity; slopes susceptible to severe water erosion.	1½ to 3 feet to silty clay shale; construction exposes silty clay to clay shale difficult to work and vegetate.	Shallow, moderately well- and well-drained clayey material over shale bedrock; low to moderate available water capacity; construction exposes silty clay shale difficult to work and vegetate.
Severe limitations — slow permeability; occasional high water table; slopes range from 2 to 12 percent; effluent seepage likely on slopes.	Slow seepage rate in upper 1 to 2 feet; slowly permeable clay shale lies at 1½ to 3 feet; occasional high water table.	Silty clay loam to silty clay subsoil and silty clay to clay shale substratum — low seepage rate when compacted; fair to poor stability and compaction character; good resistance to piping; high shrink-swell potential.	Occasional high water table; slow permeability; slopes range from 2 to 12 percent; specially designed drainage systems needed in most places.	Most favorable rooting area limited to the 1½ to 3 feet above shale bedrock. Overlying material has slow water-intake rate and low to moderate available water capacity; slopes susceptible to severe water erosion.	1½ to 3 feet to silty clay to clay shale; construction exposes clay shale difficult to work and vegetate; channels remain wet long after rains.	Shallow, somewhat poorly drained clayey material over shale bedrock; low to moderate available water capacity; construction exposes silty clay to clay shale difficult to work and vegetate; waterways remain wet long after rains.
Severe limitations — moderate permeability in silty material, but limestone bedrock occurs at about 1 foot. Most slopes exceed 12 percent. Pollution through limestone crevices is a hazard.	Moderate seepage rate in silty material; limestone bedrock lies at about 1 foot; water is lost as it seeps along bedrock fractures.	Silty material too thin in most places to use as borrow. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well and somewhat excessively drained; natural drainage is adequate.	Most favorable rooting area limited to very shallow zone above limestone bedrock. Thin overlying layer has medium water-intake rate and very low available water capacity; slopes susceptible to severe water erosion; some very steep slopes.	Limestone bedrock lies at about 1 foot; construction exposes or excavates bedrock difficult to work and vegetate; most slopes exceed 12 percent.	Very shallow, well-drained silty material over limestone bedrock; very low available water capacity; construction exposes bedrock difficult to work and vegetate; some very steep slopes.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol	Suitability as a source of			Soil features affecting suitability for engineering practices		
	Topsoil	Sand or gravel	Highway subgrade material	Highway location	Foundations for low buildings	Sewage lagoon disposal systems
(1)	(2)	(3)	(4)	(5)	(6)	(7)
St. Charles silt loam (243A, 243B, 243C, 243C2)	Surface is fair. Eroded slopes and subsoil are poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is very poor to poor; substratum is good to poor.	Moderate to high susceptibility to frost heave; nearly level to moderately sloping topography; unvegetated slopes erosive; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Slight to moderate limitations in the substratum — good to fair bearing capacity; low to moderate shrink-swell potential; good to fair shear strength.	Moderate limitations — moderate permeability.
Stronghurst silt loam (278)	Surface is fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Very poor to poor.	Moderate to high susceptibility to frost heave; nearly level topography; subsoil is plastic.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Occasional high water table.	Moderate limitations — moderate to moderately slow permeability.
Tama silt loam (36A, 36B, 36C, 36C2, 36D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Poor to very poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; nearly level to strongly sloping topography; plastic subsoil material.	Moderate limitations — fair bearing capacity; moderate shrink-swell potential; fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Thorp silt loam (206)	Surface is fair. Subsoil is poor — low in organic matter; clayey; difficult to work; frequent high water table.	Not suitable.	Subsoil is poor to very poor; substratum is good to poor.	Frequent high water table; moderate to high susceptibility to frost heave; nearly level topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate to high shrink-swell potential; fair shear strength. Slight to moderate limitations in substratum — good to fair bearing capacity; low to moderate shrink-swell potential; good to fair shear strength. Frequent high water table.	Slight limitations — slow to moderately slow permeability; no limiting factors.
Varna silt loam (223C, 223C2, 223D2)	Surface is good. Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil and substratum are poor to very poor.	High susceptibility to frost heave; unvegetated slopes highly erosive; moderately to strongly sloping topography; cuts expose calcareous silty clay loam till difficult to vegetate; highly plastic subsoil and substratum.	Severe limitations — fair bearing capacity; moderate to high shrink-swell potential; fair to poor shear strength.	Moderately slow to slow permeability. Moderate limitations on 4- to 7-percent slopes. Severe limitations on slopes over 7 percent.
Virgil silt loam (104A, 104B)	Surface is good to fair. Subsoil is poor — low in organic matter; difficult to work.	Not suitable.	Subsoil is poor to very poor; substratum is good to poor.	Occasional high water table; moderate to high susceptibility to frost heave; nearly level to gently sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Slight to moderate limitations in substratum — good to fair bearing capacity; low to moderate shrink-swell potential; good to fair shear strength. Occasional high water table.	Moderate limitations — moderate permeability; slopes range from 0 to 4 percent.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices

Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 7-percent slopes.	Moderate seepage rate.	Silty clay loam subsoil — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Loamy substratum — low to moderate seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; low to moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; high to very high available water capacity; slopes susceptible to water erosion.	Soil features favorable for construction. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Moderate limitations — moderate to moderately slow permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate.	Silty clay loam subsoil to about 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Occasional high water table; moderate to moderately slow permeability; tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; very high available water capacity; occasional high water table.	Nearly level topography — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level topography — waterways not needed. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.
Slight to moderate limitations on 0- to 4-percent slopes — moderate permeability. Moderate limitations on 4- to 12-percent slopes.	Moderate seepage rate.	Silty clay loam subsoil to about 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Medium water-intake rate; very high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes are irregular. Exposed silty clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose silty clay loam subsoil, causing difficult seedbed preparation.
Severe limitations — slow to moderately slow permeability; frequent high water table.	Moderately slow to slow seepage rate; frequent high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Silty clay loam and clay loam subsoil — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential. Loamy substratum — moderate to low seepage rate when compacted; fair to poor stability and compaction character; poor to good resistance to piping; low to moderate shrink-swell potential.	Frequent high water table; moderately slow to slow permeability; not responsive to tiling in most places; surface drainage works satisfactorily if outlets are obtained.	Slow water-intake rate; high available water capacity; frequent high water table.	Nearly level topography — terraces not needed. In some places construction of diversions to accommodate nearby hill water exposes clayey material difficult to work and vegetate.	Nearly level topography — waterways not needed. Excavation for surface ditches to accommodate water from nearby grassed waterways exposes clayey material.
Severe limitations — moderately slow to slow permeability. Material is high in clay and plastic. Seepage on slopes is a hazard.	Moderately slow seepage rate.	Predominantly silty clay loam subsoil and substratum — low seepage rate when compacted; fair stability and compaction character; good resistance to piping; moderate to high shrink-swell potential.	Soil is moderately well and well drained; natural drainage is adequate.	Most favorable rooting area limited to subsoil above calcareous silty clay loam till. Overlying material has slow water-intake rate and high available water capacity; slopes susceptible to severe water erosion.	2 to 3 feet to calcareous silty clay loam till; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose calcareous silty clay loam till difficult to work and vegetate.	Moderately deep, moderately well- and well-drained silty material over calcareous silty clay loam till; high available water capacity; deep cuts expose calcareous silty clay loam till difficult to work and vegetate.
Moderate limitations — moderate permeability, but occasional high water table.	Moderate seepage rate; occasional high water table; compacted dug ponds have low seepage rate if subsoil material is used to cover bottom of reservoir.	Predominantly silty clay subsoil — low seepage rate if compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Loamy substratum — low to moderate seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; low to moderate shrink-swell potential.	Occasional high water table; moderate permeability; tile function satisfactorily in most places if outlets are obtained.	Medium water-intake rate; high to very high available water capacity; occasional high water table.	Erosion not a hazard in most places — terraces not needed. Soil features favorable for constructing diversions to accommodate nearby hill water.	Nearly level to gently sloping topography — waterways not needed in most places. Soil features favorable for constructing surface ditches to accommodate water from nearby grassed waterways.

TABLE 9 (cont.). — INTERPRETATIONS OF ENGINEERING

Soil series and map symbol (1)	Suitability as a source of: Topsoil (2)	Sand or gravel (3)	Highway subgrade material (4)	Soil features affecting suitability for engineering practices: Highway location (5)	Foundations for low buildings (6)	Sewage lagoon disposal systems (7)
Warsaw silt loam (290C2, 290D2)	Eroded slopes are fair. Subsoil is poor — low in organic matter; difficult to work.	Good for gravel; about 2 to 3 feet of overburden in most places.	Subsoil is fair; substratum is very good.	Moderate to high susceptibility to frost action in upper 2 to 3 feet; unvegetated slopes erosive; moderately to strongly sloping topography; cuts expose gravel difficult to vegetate; large boulders and stones hinder excavation; plastic subsoil material.	Slight to moderate limitations in subsoil — good to fair bearing capacity; moderate shrink-swell potential; good to fair shear strength. Slight limitations in substratum — good bearing capacity if confined; low shrink-swell potential; good shear strength. Excavation will be difficult in some places.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent; danger of contamination through underlying gravel.
Westville silt loam and Westville soils (22C2, 22D2, 22D3, 22E2)	Eroded slopes and subsoil are poor — low in organic matter; subsoil material difficult to work.	Not suitable in most places; sand and gravel below 5 feet in some areas.	Subsoil is poor; substratum is good to poor.	Moderate to high susceptibility to frost heave; unvegetated slopes highly erosive; moderately to very strongly sloping topography; plastic subsoil material.	Moderate limitations in subsoil — fair bearing capacity; moderate shrink-swell potential; fair shear strength. Slight to moderate limitations in substratum — good to fair bearing capacity; low to moderate shrink-swell potential; good to fair shear strength.	Moderate limitations — moderate permeability. Severe limitations on slopes over 7 percent.
Woodbine silt loam and Woodbine soils (410B, 410C, 410C2, 410D, 410D2, 410D3, 410E2)	Surface is fair. Eroded slopes and subsoil are poor — low in organic matter; subsoil material difficult to work.	Not suitable for sand or gravel; possible source of limestone for crushing below 3 to 5 feet.	Subsoil is good to poor; substratum is limestone bedrock and is very good when crushed.	3 to 5 feet to limestone bedrock; moderate to high susceptibility to frost heave above the bedrock; unvegetated slopes highly erosive; gently to very strongly sloping topography; some cuts will expose bedrock difficult to vegetate; excavation below 3 to 5 feet will be difficult; subsoil plastic.	Moderate to severe limitations in subsoil — good to fair bearing capacity; low to moderate shrink-swell potential; good to fair shear strength. Limestone bedrock occurs at 3 to 5 feet.	Severe limitations — moderate permeability but bedrock occurs at 3 to 5 feet; some slopes exceed 7 percent; contamination through limestone crevices is a hazard.

TABLE 10. — ENGINEERING TEST DATA FOR SOIL SAMPLES TAKEN FROM FIVE SOIL PROFILES[a]

Soil name and location	Parent material	Report no.	Depth (in.)	Horizon	Moisture-density[b]: Max. dry density (pct.)	Optimum moist. (pct.)	Liquid limit	Plasticity index	Classification: AASHO[c]	Unified[d]
Derinda silt loam	Loess and	89-4-1	3–7	A2	109	15	23	4	A-4 (8)	CL-ML
T26N, R6E, Sec. 14	Maquoketa shale	89-4-2	13–20	IIB22t	105	20	46	22	A-7-6 (13)	CL
NW160, NE40, NW10, NE2½	bedrock	89-4-3	20–30	IIC	111	18	38	20	A-6 (12)	CL
Ogle silt loam	Loess and sandy	89-3-1	0–8	A1	102	19	35	14	A-6 (10)	CL
T26N, R9E, Sec. 26	loam glacial	89-3-2	19–28	B22t	102	21	41	21	A-7-6 (13)	CL
NE160, NE40, NW10, NW2½	till	89-3-3	38–72	IIB24t	106	17	29	13	A-6 (9)	CL
Radford silt loam	Silty alluvium	89-1-1	14–29	A13	98	22	38	14	A-6 (10)	CL
T26N, R7E, Sec. 31		89-1-2	43–60	B1b	103	21	45	24	A-7-6 (15)	CL
SW160, SW40, NE10, NE2½										
Ridott silt loam	Loess and	89-5-1	0–5	A11	100	21	35	11	A-6 (8)	ML-CL
T27N, R6E, Sec. 22	Maquoketa shale	89-5-2	24–33	B22tg	124	23	42	19	A-7-6 (12)	CL
SW160, NE40, NE10, NE2½	bedrock	89-5-3	50–72	IIC	114	17	34	16	A-6 (10)	CL
Stronghurst silt loam	Loess	89-2-1	10–16	A22	111	17	34	15	A-6 (10)	CL
T28N, R9E, Sec. 22		89-2-2	28–40	B21t	100	24	48	24	A-7-6 (15)	CL
SE160, SE40, SW10, SE2½		89-2-3	65–101	C1	112	17	31	11	A-6 (8)	CL

[a] Tests performed by Illinois Division of Highways, Bureau of Materials, Springfield, Illinois.
[b] Based on the Moisture-Density Relations of Soils Using 5.5-lb. Rammer and 12-in. Drop, AASHO Designation T 99, Method A.
[c] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation M 145-49.
[d] Based on the Unified Soil Classification System, Technical Memorandum No. 3-357, Volume 1, Waterways Experiment Station, Corps of Engineers, March, 1953.

PROPERTIES OF SOILS IN STEPHENSON COUNTY, ILLINOIS

Soil features affecting suitability for engineering practices						
Septic tank sewage disposal systems	Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Grassed waterways
	Reservoir area	Embankments				
(8)	(9)	(10)	(11)	(12)	(13)	(14)
Moderate permeability; moderate limitations on 4- to 12-percent slopes; danger of pollution through underlying gravel.	Moderate seepage rate in upper 2 to 3 feet; underlying gravel permits rapid seepage.	Subsoil is clay loam to gravelly clay loam — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential. Substratum is loose sand and gravel — rapid seepage rate even when compacted.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 2 to 3 feet above calcareous gravel. Overlying material has medium water-intake rate and moderate available water capacity; slopes susceptible to water erosion.	2 to 3 feet to calcareous sand and gravel; construction exposes subsoil material with less favorable tilth and low organic matter content; deep cuts expose gravel difficult to work and vegetate.	Moderately deep, well-drained loamy material over calcareous sand and gravel; moderate available water capacity; deep cuts expose gravel difficult to work and vegetate.
Moderate limitations on 4- to 12-percent slopes — moderate permeability. Severe limitations on slopes over 12 percent.	Moderate seepage rate.	Clay loam to gravelly sandy clay loam subsoil to about 5 feet — low seepage rate when compacted; fair to good stability and compaction character; good resistance to piping; moderate shrink-swell potential.	Soil is well and moderately well drained; natural drainage is adequate.	Medium water-intake rate; high available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction except some slopes exceed 12 percent or are irregular. Exposed clay loam subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose clay loam subsoil, causing difficult seedbed preparation.
Severe limitations —moderate permeability but limestone bedrock occurs at 3 to 5 feet; danger of pollution through limestone crevices.	Moderate seepage rate in loamy material; limestone bedrock occurs at 3 to 5 feet; water is lost as it seeps along bedrock fractures.	Predominantly silty clay loam, clay loam, and sandy clay loam subsoil — low to moderate seepage rate when compacted; fair stability and compaction character; good to poor resistance to piping; low to moderate shrink-swell potential. Substratum is dense limestone bedrock — impractical to excavate for fill material in most places.	Soil is well drained; natural drainage is adequate.	Most favorable rooting area limited to the 3 to 5 feet above limestone bedrock. Overlying loamy material has medium water-intake rate and moderate available water capacity; slopes susceptible to severe water erosion.	Soil features favorable for construction of conventional terraces except some slopes exceed 12 percent or are irregular. Cuts for parallel terraces expose limestone bedrock in some places. Exposed subsoil has less favorable tilth and low organic matter content.	Soil features favorable for construction. Some cuts expose subsoil, causing difficult seedbed preparation.

TABLE 10 (cont.).

Soil name	Horizon	Mechanical analysis[e]												
		Percentage passing sieve									Percentage smaller than			
		1½-in.	1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.
Derinda silt loam (continued)	A2						100	99	98	98	91	60	24	19
	IIB22t	100	95	92	87	84	74	73	73	72	70	58	43	36
	IIC	100	94	93	92	92	91	90	88	83	81	77	61	56
Ogle silt loam (continued)	A1						100	99	99	98	91	60	35	29
	B22t						100	100	99	99	91	71	42	33
	IIB24t		100	99	98	98	96	92	87	73	71	58	34	29
Radford silt loam (continued)	A13						100	99	98	98	94	68	36	30
	B1b						100	99	96	90	81	62	40	31
Ridott silt loam (continued)	A11					100	99	97	96	95	90	69	33	25
	B22tg							100	99	99	94	67	42	34
	IIC	100	99	98	97	96	96	89	87	79	75	65	43	39
Stronghurst silt loam (continued)	A22						100	97	96	94	90	64	30	24
	B21t							100	99	99	95	76	49	43
	C1				100	99	99	98	97	96	81	63	29	19

[e] Mechanical analyses according to the AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

Stephenson County, which had their source mainly in the Mississippi River flood plain, cover the bedrock and glacial drift in varying thicknesses and are thickest in the level to gently sloping upland areas. Where loess deposits are about 5 feet or more thick, the soils are developed entirely in loess. Peoria Loess is the dominant deposit, but in places Roxana silts occur below thin Peoria Loess and serve as part of the parent material for some of the loess-derived soils.

On level to gently sloping stable landscape positions, loess deposits range from about 7 to 13 feet thick in the western and southern portions of the county to 3 or 4 feet thick in the northeastern part of the county, exhibiting a definite thinning pattern in a northeasterly direction (*28*). Loess is an excellent parent material because of its silty texture, moderate bulk density and permeability, and well-balanced mineral content (*5*). It is the single parent material of most of the soils in soil associations A and B on the general soil map (page 135) and is the surface material of many of the other soils developed in more than one parent material. Nine soil series in the county have developed entirely in loess, including Tama, Fayette, and Downs, the three most extensive soils in Stephenson County.

Loess deposits are frequently thin on the moderately and strongly sloping areas and may be nonexistent in the very strongly sloping to steep areas in the upland. On these slopes, soils are often developed partly in loess and partly in underlying glacial drift (till, outwash, or both). At present, most of the glacial deposits in Stephenson County are considered Illinoian in age (*30*). The drift deposits vary from a few kame and esker-like landforms containing sand and gravel to till deposits of sandy loam, loam, and silty clay loam or finer textures. Included with drift in the mapping of Stephenson County soils are variable erosional sediments emanating from the eroded till areas. These erosional sediments in many places were subsequently covered by varying thicknesses of loess; where loess deposits are less than about 5 feet thick, the soils developed in both the loess and underlying sediments.

In those areas of glacial sediments where the loess cover is thin, soil variation is great because of the variable nature of the drift and because of the intense episodes of both water and wind erosion of the drift prior to loess deposition (*8*).

Stratified drift and lake sediments are important parent materials in major valleys such as the Pecatonica River Valley and Richland and Yellow Creek Valleys. They usually occur as benches or terrace-like formations at higher levels than the recent alluvium. Some of these deposits represent some of the younger glacial sediments in Stephenson County and were the result of the blocking of the Pecatonica River by ice of the Altonian Substage of the Wisconsinian Stage (*30*).

In many areas of Stephenson County and most commonly on the steeper slopes, the bedrock, which is primarily dolomite but also includes calcareous shale, occurs at depths of less than 5 feet. The bedrock represents an important part of the soil profiles and has a great effect on their properties and potential uses. Where bedrock occurs at depths of less than 5 feet, the surficial material may be mostly loess or, more commonly, a combination of loess and drift.

The flood plains of the major streams contain mainly recently deposited silty material washed in from the upland slopes. These are the most youthful parent materials and the soils developed in them do not have well-developed profiles. A very few areas of organic parent materials (muck) occur in poorly drained positions, primarily associated with flood plains, or occasionally in narrow upland drainageways.

CLIMATE

Climate is an important soil-forming factor because the kind and degree of weathering, which greatly affect soil profiles and their properties, are largely controlled by rainfall and temperature. Climate is also largely responsible for the type of native vegetation that grew on the soils. The humid-temperate climate of Stephenson County favors the weathering and reduction in size of soil minerals and the formation and movement of clay downward in the soil profile, especially where parent materials have been in place for a long period of time. The prevailing rainfall has also influenced the removal, through leaching, of some of the basic elements, replacing them with hydrogen and thus imparting varying degrees of acidity to horizons of the soil profiles.

PLANTS AND ANIMALS

The vegetation that grew in Stephenson County prior to the time of settlement is responsible for some differences in soils, especially through the accumulation of organic matter and its influence on surface soil color. The dark-colored soils developed under native prairie grasses; the light-colored soils developed where forests, dominated by oak and hickory trees, grew for long periods of time. Some soils developed under mixed grass and forest or were forested for a relatively short time before being cleared; these soils have moderately dark-colored surfaces with intermediate organic matter contents. The type of vegetation under which each soil series developed is discussed in each soil series description.

Animals that live on and in the soil have also influenced soil development but generally to a lesser extent than plants. The activities of man — clearing forests, cultivating, fertilizing, draining, irrigating, and excavating and filling — have changed the course of soil formation. These activities have been recent enough, however, that their effects on soil development are not yet very apparent. Over time this influence will become more significant.

TOPOGRAPHY AND DRAINAGE

Topography influences water infiltration and percolation, runoff, and erosion in a given area. The moisture status of most soils in a given climate is largely controlled by topography and drainage. Where soils are developed in uniform, permeable, medium-textured materials such as loess, natural drainage is closely related to slope. Well- and moderately well-drained soils occur on sloping areas, and somewhat poorly or poorly drained soils tend to occur on level areas or in depressions. In areas of very permeable sandy parent materials, well-drained soils may occur on all slopes, including level areas, unless there is a permanently high water table. Conversely, poorly and somewhat poorly drained soils may occur on slopes in areas with slowly permeable parent materials such as shale bedrock, which has a high clay content.

Sloping land surfaces and permeable parent materials, which dominate most of the upland areas of Stephenson County, are conducive to the development of well-drained soils with deep water tables. Somewhat poorly and poorly drained soils occur in the uplands on level areas or in depressions and on slopes where soils are derived from shale, but many also occur in level stream terrace areas or in the stream flood plains.

On steep slopes, rainfall tends to run off rather than pass through the soil profile. This fact, coupled with the removal of materials under natural conditions on steep slopes, results in the development of soils with thin sola and weak profile development or horizonation.

TIME

The evaluation of the time factor in soil development and formation is difficult because of the combined influence of the other previously discussed factors of soil formation. The influence of time cannot be evaluated simply in years. A relatively "youthful" or slightly weathered soil and a relatively "old" or strongly weathered soil may develop in the same period of time if other factors of formation are quite different. If other formation factors are similar, however, soils are usually more strongly developed or weathered and have greater horizon differentiation if they have been exposed to soil formation processes over a longer time.

Many soils of Stephenson County are relatively young. The most youthful and least differentiated (lacking distinct horizons) are those that occur on stream flood plains or, occasionally, at the base of very steep slopes and some of those that have developed on very steep slopes from a variety of parent materials. The soils derived primarily from loess in the upland or from materials on some stream terraces are related in age to relatively recent glacial events, and many are probably less than about 12,000 years old (*28*). Profiles that are partially or entirely developed in the glacial drift, bedrock, or both, however, may represent weathering of much longer duration and under climatic conditions much different than at present and are considered to be paleosols.

The age or time of effective weathering of soils derived partly or entirely from glacial drift and partly from bedrock on slopes is difficult to determine. In some areas, Illinoian-age glacial drift or geologically older bedrock may have been weathering for many thousands of years before loess deposition; strongly developed soils with thick sola may have developed in them. If these soils are covered by thin loess deposits, such as 1 to 4 feet thick, modern soils develop in the loess and the upper part of the older buried soil (paleosols). On other slopes, where glacial drift is also the parent material, erosion may have completely removed the old soils, and new soils may have developed that are the same age as those developed in thick loess parent material on more gentle slopes. Therefore, soils derived from glacial drift or bedrock on slopes may be old and highly weathered or relatively young, depending upon the erosional history of the respective slopes, both prior to and following loess deposition.

Soils are weathered and develop more rapidly in materials containing low rather than high amounts of carbonate, in permeable rather than slowly permeable materials, and under forest rather than grass vegetation. Such differences are not readily recognized by persons not trained in the science of soils, however.

Classification of the Soils

Soils are classified so that we can see their relationship to one another, more easily remember their significant characteristics, assemble knowledge about them, and understand their behavior and their response to the whole environment. Through classification and the preparation and use of soil maps, we can apply our knowledge of soils to individual tracts of land.

The current system used to classify soils was adopted for general use by the National Cooperative Soil Survey in 1965. After further study, evaluation, and some revisions, the classification system was published as *Soil Taxonomy* (preliminary text) in 1973 (*26*). Those readers interested in the development and details of this classification system should consult this publication.

Table 11 gives the classification of each soil series in Stephenson County. The classification system defines classes in terms of observable or measurable properties of soils. The properties used are mainly those that permit the grouping of soils with a similar genesis. This system, designed to accommodate all known soils, has six categories; beginning with the most inclusive, these are the order, suborder, great group, subgroup, family, and series.

ORDER

The properties used to differentiate the soil orders are those that have resulted from similar processes acting to about the same degree, as indicated by the presence or absence of major diagnostic horizons. Ten classes of orders are recognized: Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols. The orders tend to give

TABLE 11. — CLASSIFICATION OF SOIL SERIES[a]

Soil series	Family	Subgroup	Order
Argyle	Fine loamy, mixed, mesic	Mollic Hapludalf	Alfisol
Ashdale	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Atlas	Fine, montmorillonitic, mesic, sloping	Aeric Ochraqualf	Alfisol
Atterberry	Fine silty, mixed, mesic	Udollic Ochraqualf	Alfisol
Batavia	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Birkbeck	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Calamine[b]	Fine, illitic, mesic	Typic Argiaquoll	Mollisol
Camden	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Casco	Fine loamy over sandy or sandy skeletal, mixed, mesic	Typic Hapludalf	Alfisol
Catlin	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Coatsburg	Fine, montmorillonitic, mesic, sloping	Typic Argiaquoll	Mollisol
Derinda	Fine, mixed, mesic	Typic Hapludalf	Alfisol
Dickinson	Coarse loamy, mixed, mesic	Typic Hapludoll	Mollisol
Dodgeville	Fine silty over clayey, mixed, mesic	Typic Argiudoll	Mollisol
Dorchester	Fine silty, mixed, calcareous, mesic	Typic Udifluvent	Entisol
Downs	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Drummer	Fine silty, mixed, mesic	Typic Haplaquoll	Mollisol
Dubuque	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Dunbarton	Clayey, montmorillonitic, mesic	Lithic Hapludalf	Alfisol
Durand	Fine loamy, mixed, mesic	Typic Argiudoll	Mollisol
Edgington	Fine silty, mixed, mesic	Argiaquic Argialboll	Mollisol
Elburn	Fine silty, mixed, mesic	Aquic Argiudoll	Mollisol
Eleroy	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Fayette	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Fishhook	Fine, montmorillonitic, mesic	Aquic Hapludalf	Alfisol
Flagg	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Fox	Fine loamy over sandy or sandy skeletal, mixed, mesic	Typic Hapludalf	Alfisol
Griswold	Fine loamy, mixed, mesic	Typic Argiudoll	Mollisol
Harpster	Fine silty, mesic	Typic Calciaquoll	Mollisol
Harvard	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Hitt	Fine loamy, mixed, mesic	Typic Argiudoll	Mollisol
Houghton	Euic, mesic	Typic Medisaprist	Histosol
Huntsville	Fine silty, mixed, mesic	Cumulic Hapludoll	Mollisol
Keller	Fine, montmorillonitic, mesic	Aquic Argiudoll	Mollisol
Keltner	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Kendall	Fine silty, mixed, mesic	Aeric Ochraqualf	Alfisol
Kidder	Fine loamy, mixed, mesic	Typic Hapludalf	Alfisol
Lawson	Fine silty, mixed, mesic	Cumulic Hapludoll	Mollisol
Lena	Euic, mesic	Typic Medisaprist	Histosol
Loran	Fine silty, mixed, mesic	Aquic Argiudoll	Mollisol
Massbach	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Miami	Fine loamy, mixed, mesic	Typic Hapludalf	Alfisol
Millbrook	Fine silty, mixed, mesic	Udollic Ochraqualf	Alfisol
Millington	Fine loamy, mixed, calcareous, mesic	Cumulic Haplaquoll	Mollisol
Morley	Fine, illitic, mesic	Typic Hapludalf	Alfisol
Muscatine[c]	Fine silty, mixed, mesic	Aquic Argiudoll	Mollisol
Myrtle	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Nasset	Fine silty, mixed, mesic	Mollic Hapludalf	Alfisol
Octagon	Fine loamy, mixed, mesic	Mollic Hapludalf	Alfisol
Ogle	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Oneco	Fine loamy, mixed, mesic	Mollic Hapludalf	Alfisol
Orion	Coarse silty, mixed, nonacid, mesic	Aquic Udifluvent	Entisol
Otter	Fine silty, mixed, mesic	Cumulic Haplaquoll	Mollisol
Palsgrove	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Parr	Fine loamy, mixed, mesic	Typic Argiudoll	Mollisol
Pecatonica	Fine loamy, mixed, mesic	Typic Hapludalf	Alfisol
Plano	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Proctor	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Radford	Fine silty, mixed, mesic	Fluventic Hapludoll	Mollisol
Ridott	Fine silty, mixed, mesic	Mollic Ochraqualf	Alfisol

[a] Dorchester, cobbly subsoil variant (578) is not included in this table.
[b] The small areas of the Calamine series in Stephenson County may classify as mixed rather than illitic mineralogy in the family category.
[c] The Muscatine series has recently been reclassified as an Aquic Hapludoll, but most areas mapped as Muscatine in Stephenson County are believed to be Aquic Argiudolls.

TABLE 11 (cont.)

Soil series	Family	Subgroup	Order
Rodman	Sandy skeletal, mixed, mesic	Typic Hapludoll	Mollisol
Rozetta	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Sable	Fine silty, mixed, mesic	Typic Haplaquoll	Mollisol
Sawmill	Fine silty, mixed, mesic	Cumulic Haplaquoll	Mollisol
Schapville	Fine, mixed, mesic	Typic Argiudoll	Mollisol
Shullsburg	Fine, mixed, mesic	Aquic Argiudoll	Mollisol
Sogn	Loamy, mixed, mesic	Lithic Haplustoll	Mollisol
St. Charles	Fine silty, mixed, mesic	Typic Hapludalf	Alfisol
Stronghurst	Fine silty, mixed, mesic	Aeric Ochraqualf	Alfisol
Tama	Fine silty, mixed, mesic	Typic Argiudoll	Mollisol
Thorp	Fine silty, mixed, mesic	Argiaquic Argialboll	Mollisol
Varna	Fine, illitic, mesic	Typic Argiudoll	Mollisol
Virgil	Fine silty, mixed, mesic	Udollic Ochraqualf	Alfisol
Warsaw	Fine loamy over sandy or sandy skeletal, mixed, mesic	Typic Argiudoll	Mollisol
Westville	Fine loamy, mixed, mesic	Typic Hapludalf	Alfisol
Woodbine	Fine loamy, mixed, mesic	Typic Hapludalf	Alfisol

broad climatic groupings of soils, but Entisols and Histosols occur in many different climates.

The four orders represented in Stephenson County are Alfisols, Entisols, Histosols, and Mollisols. Alfisols are soils with clay-enriched B horizons, relatively high base saturation, and light-colored or thin surface horizons (ochric epipedons). Entisols are very young soils that have no genetic horizons or only the beginnings of horizons. Histosols, developed in materials very high in organic matter, have horizons or layers quite different from the mineral soils. Mollisols have thick, dark-colored surface layers (mollic epipedons) and usually have developed under grass vegetation; their surfaces have moderate to strong structure, and the base saturation in surface and subsurface horizons is high. Mollisols and Alfisols comprise the majority of soils in Stephenson County.

SUBORDER

Each order is subdivided into suborders, primarily on the basis of characteristics that seem to produce classes having genetic similarity. The soil properties used to separate suborders are mainly those that reflect the presence or absence of wetness and that reflect soil differences resulting from the climate or vegetation. The climatic range is more narrow than that of the orders.

GREAT GROUP

Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major horizons and soil features. The horizons used for distinguishing between great groups are those in which clay, iron, or humus have accumulated and those with pans that interfere with growth of roots or movement of water. Some of the features used are the self-mulching properties of clays, soil temperature, and chemical composition (mainly calcium, magnesium, sodium, and potassium content).

SUBGROUP

Great groups are divided into subgroups. One subgroup represents the central (typic) segment of this category. Other subgroups, called intergrades, have properties of one great group but also one or more properties of another great group, suborder, or order. Subgroups may also be established in instances where soil properties intergrade outside the range of any other group, suborder, or order.

FAMILY

Families are established within a subgroup primarily on the basis of properties that affect the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

SERIES

The series category has the narrowest range of characteristics of the six categories of the classification system. The series is a group of soils that have developed from a particular kind of parent material and have genetic horizons similar in differentiating characteristics and arrangement in the profile. These differentiating characteristics include morphological features such as color, structure, reaction, consistence, chemical and mineralogical composition, and kind, thickness, and arrangement of horizons. Texture is included in all horizons except the surface.

A particular series is quite uniform in its characteristics, and the differentiae used are differences that have been demonstrated through experience or research to be important in influencing the kinds of statements we can make about the behavior of the soil.

If genetic horizons are thin or absent, as in very youthful soils, series are uniform in their properties within a defined depth limit, usually the upper 40 inches.

LABORATORY DATA REFERENCES

Data on certain physical, chemical, and mineralogical, properties of soils sampled in Stephenson County, and data from soils sampled in other counties but applicable to soils in Stephenson County, are available in various publications.

Data for Tama, Muscatine, Sable, Fayette, Rozetta, and Stronghurst soils are given in Loess Soils of Northwest Illinois (*28*).

Data on Derinda, Eleroy, Schapville, and Keltner soils are given in two papers, "Rooting Volume of Corn and Alfalfa in Shale-Influenced Soils in Northwestern Illinois" (*6*) and "Mineralogical and Chemical Characteristics of Soils in Loess Overlying Shale in Northwestern Illinois" (*16*).

Data for representative profiles of Argyle, Ashdale, Atlas, Dodgeville, Fishhook, Keller, Millbrook, Ogle, Pecatonica, and Tama soils from Stephenson or nearby counties are on file in graduate student theses or data books in the Department of Agronomy, University of Illinois at Urbana-Champaign.

LITERATURE CITED

1. Barrett, Mrs. J. W. (Ed.). History of Stephenson County, Illinois. Kable Printing Company, Mt. Morris, Illinois. 1970.
2. Broadfoot, W. M. Field Guide for Evaluating Cottonwood Sites. USDA Forest Ser., Southern Forest Exp. Sta. Occas. Paper 178. 1960.
3. Busch, W. L. Mineral Production in Illinois in 1971 and Summary of Illinois Mineral Production by Commodities, 1941-1970. Ill. State Geol. Survey Circ. 477. 1973.
4. Doyle, F. L. Geology of the Freeport Quadrangle, Illinois. Ill. State Geol. Survey Circ. 395. 1965.
5. Fehrenbacher, J. B., Ray, B. W., and Alexander, J. D. Illinois Soils and Factors in Their Development. The Quarternary of Illinois. Univ. of Ill. Coll. of Agr., Spec. Pub. 14. 1968.
6. Fehrenbacher, J. B., Ray, B. W., and Edwards, W. M. Rooting Volume of Corn and Alfalfa in Shale-Influenced Soils in Northwestern Illinois. *Soil Sci. Soc. Am. Proc.* 29:591-594. 1965.
7. Follmer, L. R. The Genesis of Paleo-Humic Gley Soils of Stephenson County, Illinois. M.S. thesis, Univ. of Ill. Dept. of Agron. 1967.
8. Frye, J. C., Glass, H. D., Kempton, J. P., and Willman, H. B. Glacial Tills of Northwestern Illinois. Ill. State Geol. Survey Circ. 437. 1969.
9. Fulwider, A. L. Stephenson County, Illinois, Biography. S. J. Clarke Publishing Company, Chicago, Illinois. 1910.
10. Hackett, J. E., and Bergstrom, R. E. Groundwater in Northwestern Illinois. Ill. State Geol. Survey Circ. 207. 1956.
11. Hershey, O. H. The Silveria Formation. *Am. Jour. Sci.* (4th series) 2:324-330. 1896.
12. Hershey, O. H. The Gold-Bearing Formation of Stephenson County, Illinois. *Am. Geol.* 24:240-244. 1899.
13. Horberg, Leland. Bedrock Topography of Illinois. Ill. State Geol. Survey Bull. 73. 1950.
14. Huff, F. A., and Changnon, S. A., Jr. Hail Climatology of Illinois. Ill. State Water Survey. Report of Investigations No. 38. 1959.
15. Illinois Cooperative Crop Reporting Service. Illinois Agricultural Statistics, Annual Summary. Ill. Dept. of Agric. and USDA Bull. 73-1. 1973.
16. Jones, R. L., Ray, B. W., Fehrenbacher, J. B., and Beavers, A. H. Mineralogical and Chemical Characteristics of Soils in Loess Overlying Shale in Northwestern Illinois. *Soil Sci. Soc. Am. Proc.* 31:800-804. 1967.
17. Joos, L. A. Freeze Probabilities in Illinois. Ill. Agr. Exp. Sta. in cooperation with U.S. Weather Bureau. Bull. 650. 1960.
18. Leighton, M. M., Ekblaw, G. E., and Horberg, L. Physiographic Divisions of Illinois. Ill. State Geol. Survey. Report of Investigations No. 129. 1948.
19. Lemmon, P. E. Grouping Soils on the Basis of Woodland Suitability. Tree Growth and Forest Soils, Proceedings of the Third North American Forest Soils Conference. Oregon State University Press, Corvallis, Oregon. 1968.
20. Odell, R. T., and Oschwald, W. R. Productivity of Illinois Soils. Univ. of Ill. Coop. Ext. Circ. 1016. 1970.
21. Piskin, K., and Bergstrom, R. E. Glacial Drift in Illinois: Thickness and Character. Ill. State Geol. Survey Circ. 416. 1967.
22. Putnam, J. A., Furnival, G. M., and McKnight, J. S. Management and Inventory of Southern Hardwoods. USDA Handbook No. 181. 1960.
23. Schnur, G. L. Yield, Stand, and Volume Tables for Even-Aged Upland Oak Forests. USDA Tech. Bull. 560. 1937.
24. Shaw, J. Geology of Stephenson County, Illinois, *in* Worthen *et al.,* Geology and Paleontology. Ill. State Geol. Survey. 1873.

25. USDA. Soil Survey Manual. Agric. Handbook No. 18. U.S. Govt. Printing Office, Washington, D.C. 1951.

26. USDA. Soil Taxonomy — A Basic System of Soil Classification for Making and Interpreting Soil Surveys (preliminary abridged text). U.S. Govt. Printing Office, Washington, D.C. 1973.

27. Walton, W. C., and Csallany, S. Yields of Deep Sandstone Wells in Northern Illinois. Ill. State Water Survey. Report of Investigations No. 43. 1962.

28. Wascher, H. L., Ray, B. W., Alexander, J. D., Fehrenbacher, J. B., Beavers, A. H., and Jones, R. L. Loess Soils of Northwest Illinois. Ill. Agr. Exp. Sta. Bull. 739 in cooperation with USDA Soil Cons. Serv. 1971.

29. Willman, H. B. Rock Stratigraphy of the Silurian System in Northeastern and Northwestern Illinois. Ill. State Geol. Survey Circ. 479. 1973.

30. Willman, H. B., and Frye, J. C. Pleistocene Stratigraphy of Illinois. Ill. State Geol. Survey Bull. 94. 1970.

GLOSSARY

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

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity. The capacity of the soil to hold water that can be used by plants. Water held between the wilting point (15 atmospheres of tension) and the field capacity (1/3 atmosphere). In this publication the classes of available moisture capacity to a depth of 60 inches are defined as follows:

Very high......12 inches or more
High...............9 to 12 inches
Moderate...........6 to 9 inches
Low................3 to 6 inches
Very low........less than 3 inches

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen; expressed as a percentage of the cation-exchange capacity.

Bottomland. Nearly level land on the bottom of a valley that has a stream flowing through it. Subject to flooding and often referred to as a flood plain.

Calcareous soil. A soil that contains enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) when treated with cold, dilute hydrochloric acid.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

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

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors, consisting of concentrations of compounds or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. The following terms are commonly used to describe consistence:

Loose — Noncoherent when dry or moist; does not hold together in a mass.

Friable — When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm — When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic — When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky — When wet, adheres to other material and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard — When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft — When dry, breaks into powder or individual grains under very slight pressure.

Cemented — Hard and brittle; little affected by moistening.

Contour farming. Conducting field operations such as plowing, planting, cultivating, and harvesting in rows that are at right angles to the natural direction of the slope and as nearly level as practical.

Contour stripcropping. Growing crops in strips that follow the contour of the land or that are parallel to terraces or diversions; strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Cover crops. Close-growing crops; grown primarily to improve the soil and protect it between periods of regular crop production or grown between trees in orchards.

Crop residue. The part of a plant, or crop, left in the field after harvest.

Depth of soil. Thickness of soil over a specified layer, generally a layer that does not permit the growth of roots. Classes used in this survey are as follows:

Deep..........36 inches or more
Moderately deep...20 to 36 inches
Shallow..........10 to 20 inches
Very shallow...less than 10 inches

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, protects areas downslope from the effects of such runoff.

Drainage, natural soil. Conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil; as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well-drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time; in the forested, light-colored soils, they commonly have mottlings below a depth of 6 to 16 inches (in the lower A horizon) and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents. For a detailed description of erosion terms see page 1.

Glacial outwash. Cross-bedded gravel, sand, and silt deposited by melt water as it flowed from glacial ice.

Glacial till. Unstratified glacial drift consisting of clay, silt, sand, gravel, and boulders transported and deposited by glacial ice.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. "Gleyed" soil horizons have yellow and gray mottling caused by intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, covered by grass for protection against erosion; used to conduct surface water away from cropland.

Green-manure crop. A crop of grasses or legumes worked into the soil while green or soon after maturity to improve soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon — The layer of organic matter (decaying plant residues) on the surface of a mineral soil.

A horizon — The mineral horizon at the surface or just below an O horizon. This horizon, the one in which living organisms are most active, is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon — The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizons; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon — The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer — Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Intake rate. The rate of entry of water into the soil, usually expressed in inches per hour. In this survey the intake rate classes are *rapid,* more than 1.5 inches per hour; *medium,* 1.0 to 1.5 inches per hour; and *slow,* less than 1.0 inch per hour. These rates apply to the upper 18 inches of soil where the soil is unsaturated and where its surface is covered by vegetation.

Lacustrine deposits. Materials deposited in the waters of lakes and exposed by the lowering of the water level or by the elevation of the land.

Leached soil. A soil from which most of the soluble constituents have been removed throughout the entire profile or removed from one part of the profile and accumulated in another part.

Loess. A uniform, silty material transported by wind and deposited on the land.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance — *few, common,* and *many;* size — *fine, medium,* and *coarse;* and contrast — *faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimensions; *medium,* ranging from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A system for designating soil color by degrees of the three simple variables — hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Organic-matter content. Ratings used in this report have the following general limits: very low — less than 1 percent of volume; low — 1 to 2 percent of volume; moderately low — 2 to 3 percent; moderate — 3 to 4 percent; and high — more than 4 percent. The two Histosols (organic soils) are rated very high.

Paleosols. Soils that are older than many of the associated soils in the same general area or present landscape and that were originally on the surface of preexisting landscapes. A common example as used in this report is the soil or weathered zone developed in Illinoian-age drift that in many places was buried beneath much younger Peoria (Woodfordian-age) Loess. In some places, the Illinoian drift paleosol is buried deeply beneath several feet of loess in which a much younger, modern soil has developed. In other places, where loess is less than about 4 or 5 feet thick, the modern soil is developed in both the younger loess and in the upper part of the buried soil or paleosol. Some paleosols that were buried for a time may have been completely exhumed by erosion and now occupy the landscape surface again.

Permeability, soil. The quality of a soil that enables it to transmit air and water. The following relative classes of soil permeability used in this soil survey refer to estimated rates of movement of water in inches per hour:

Very slow	less than 0.06
Slow	0.06- 0.20
Moderately slow	0.20- 0.60
Moderate	0.60- 2.00
Moderately rapid	2.00- 6.0
Rapid	6.0 -20.0

Phase, soil. A subdivision of a soil series or other unit in the soil classification system made because of differences in the soil that affect its management but not its classification in the natural landscape. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects its management but not its behavior in the natural landscape.

Profile, soil. A vertical section of the soil that passes through all its horizons and extends into the substratum.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil with a pH of 7.0 is precisely neutral in reaction, neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed as follows:

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Sand. Individual rock or mineral fragments having diameters ranging from 0.05 to 2.0 millimeters; most sand grains consist of quartz, but they may be any mineral composition. Also, the textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils that developed from a particular type of parent material and that have genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil, which range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plants and animal life characteristic of the soil are largely confined to the solum. The plural of solum is sola.

Stratified. Composed of or arranged in strata, or layers, such as stratified alluvium. The term is confined to geological materials. Layers in soils that result from the processes of soil formation are called horizons; layers inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are *platy* (laminated), *prismatic* (vertical axis of aggregates is longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. Structureless soils are *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhere together without any regular cleavage, as in many claypans and hardpans).

Subgrade material. The prepared and compacted soil material below the road pavement system; called the "basement soil."

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. The horizon between the surface layer and the subsoil; generally, the A2 horizon.

Surface layer. A nontechnical term used for one or more layers above the subsoil; includes the A horizon and, in places, part of the B horizon; has no depth limit.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the seas and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil, especially soil structure, in relation to the growth of plants. Good tilth refers to the friable state and is associated with high, noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland. Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace; land above the lowland along rivers.

Variant. A soil with many characteristics of the series in which it is placed but differing in at least one important characteristic, as indicated by its name. The acreage of a variant is of too small extent to justify establishing a new series. A new series may be designated to replace the variant, however, if sufficient acreage is later found.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Weathering. The physical and chemical disintegration and decomposition of rocks and minerals. Soil is the result of weathering and other chemical, physical, and biological alterations that have changed the upper part of the earth's crust through various periods of time.

GUIDE TO MAPPING UNITS

This guide, in which the mapping units are listed numerically, indicates the capability unit (management group) for each mapping unit, the group symbols or numbers for individual mapping units in various interpretive tables, and the page numbers for the series descriptions. Mapping unit information can be found in tables as indicated.

Predicted yields and acreage, Table 4 (pages 72-75).
Woodland groups, Table 5 (pages 78-79).
Wildlife groups, Table 6 (page 80).
Recreation groups, Table 7 (page 81).
Engineering uses of the soils, Table 8 (pages 84-89), Table 9 (pages 92-119), and Table 10 (pages 118-119).

Map symbol	Mapping unit	Description	Capability unit		Woodland group	Wildlife group	Recreation group
		Page	Symbol	Page			
21B	Pecatonica silt loam, 2- to 4-percent slopes	50	IIe-1	64	2o1	1	1
21C	Pecatonica silt loam, 4- to 7-percent slopes	50	IIe-1	64	2o1	1	1
21C2	Pecatonica silt loam, 4- to 7-percent slopes, moderately eroded	50	IIe-1	64	2o1	1	1
21D2	Pecatonica silt loam, 7- to 12-percent slopes, moderately eroded	50	IIIe-1	66	2o1	1	2
22C2	Westville silt loam, 4- to 7-percent slopes, moderately eroded	59	IIe-1	64	2o1	1	1
22D2	Westville silt loam, 7- to 12-percent slopes, moderately eroded	59	IIIe-1	66	2o1	1	2
22D3	Westville soils, 7- to 12-percent slopes, severely eroded	59	IVe-1	68	2o1	1	2
22E2	Westville silt loam, 12- to 18-percent slopes, moderately eroded	59	IVe-1	68	2r2	2	3
27C2	Miami silt loam, 4- to 7-percent slopes, moderately eroded	43	IIe-1	64	2o1	1	1
27D2	Miami silt loam, 7- to 12-percent slopes, moderately eroded	43	IIIe-1	66	2o1	1	2
27D3	Miami soils, 7- to 12-percent slopes, severely eroded	43	IVe-1	68	2o1	1	2
27E2	Miami silt loam, 12- to 18-percent slopes, moderately eroded	43	IVe-1	68	2r2	2	3
29C	Dubuque silt loam, 4- to 7-percent slopes	30	IIIe-2	67	3o1	6	1
29C2	Dubuque silt loam, 4- to 7-percent slopes, moderately eroded	30	IIIe-2	67	3o1	6	1
29D	Dubuque silt loam, 7- to 12-percent slopes	30	IVe-2	69	3o1	6	2
29D2	Dubuque silt loam, 7- to 12-percent slopes, moderately eroded	30	IVe-2	69	3o1	6	2
36A	Tama silt loam, 0- to 2-percent slopes	57	I-1	64	1o1	1	1
36B	Tama silt loam, 2- to 4-percent slopes	57	IIe-1	64	1o1	1	1
36C	Tama silt loam, 4- to 7-percent slopes	57	IIe-1	64	1o1	1	1
36C2	Tama silt loam, 4- to 7-percent slopes, moderately eroded	57	IIe-1	64	1o1	1	1
36D2	Tama silt loam, 7- to 12-percent slopes, moderately eroded	57	IIIe-1	66	1o1	1	2
40C	Dodgeville silt loam, 4- to 7-percent slopes	28	IIIe-2	67	3o1	6	1
40C2	Dodgeville silt loam, 4- to 7-percent slopes, moderately eroded	28	IIIe-2	67	3o1	6	1
40D2	Dodgeville silt loam, 7- to 12-percent slopes, moderately eroded	28	IVe-2	69	3o1	6	2
40E2	Dodgeville silt loam, 12- to 18-percent slopes, moderately eroded	28	VIe-1	70	3r2	6	3
41A	Muscatine silt loam, 0- to 2-percent slopes	45	I-2	64	2o1	3	4
41B	Muscatine silt loam, 2- to 4-percent slopes	45	IIe-2	65	2o1	3	4
61A	Atterberry silt loam, 0- to 2-percent slopes	23	I-2	64	3o1	3	4
61B	Atterberry silt loam, 2- to 4-percent slopes	23	IIe-2	65	3o1	3	4
67	Harpster silty clay loam	36	IIw-1	65	2w3	5	6
68	Sable silty clay loam	53	IIw-1	65	2w3	5	6
74	Radford silt loam	51	I-2	64	2o4	4	5
W74	Radford silt loam, wet	51	Vw-1	70	2w5	5	7
76	Otter silt loam	48	IIw-1	65	2w5	5	7
W76	Otter silt loam, wet	48	Vw-1	70	2w5	5	7
77	Huntsville silt loam	38	I-1	64	1o4	4	5
82	Millington silt loam	44	IIw-1	65	2w5	5	7
87B	Dickinson sandy loam, 2- to 4-percent slopes	27	IIIe-3	67	3s2	1	1
87C2	Dickinson sandy loam, 4- to 7-percent slopes, moderately eroded	27	IIIe-3	67	3s2	1	1
103	Houghton muck	37	IIIw-1	68	2w5	5	7
W103	Houghton muck, wet	37	Vw-1	70	2w5	5	7
104A	Virgil silt loam, 0- to 2-percent slopes	58	I-2	64	2o1	3	4
104B	Virgil silt loam, 2- to 4-percent slopes	58	IIe-2	65	2o1	3	4
105A	Batavia silt loam, 0- to 2-percent slopes	23	I-1	64	2o1	1	1
105B	Batavia silt loam, 2- to 4-percent slopes	23	IIe-1	64	2o1	1	1
105C	Batavia silt loam, 4- to 7-percent slopes	23	IIe-1	64	2o1	1	1
107	Sawmill silty clay loam	54	IIw-1	65	2w5	5	7
W107	Sawmill silty clay loam, wet	54	Vw-1	70	2w5	5	7
134B	Camden silt loam, 2- to 4-percent slopes	25	IIe-1	64	1o1	1	1
134C	Camden silt loam, 4- to 7-percent slopes	25	IIe-1	64	1o1	1	1
134C2	Camden silt loam, 4- to 7-percent slopes, moderately eroded	25	IIe-1	64	1o1	1	1
134D2	Camden silt loam, 7- to 12-percent slopes, moderately eroded	25	IIIe-1	66	1o1	1	2
134D3	Camden soils, 7- to 12-percent slopes, severely eroded	25	IVe-1	68	1o1	1	2
134E2	Camden silt loam, 12- to 18-percent slopes, moderately eroded	25	IVe-1	68	2r2	2	3
148A	Proctor silt loam, 0- to 2-percent slopes	51	I-1	64	1o1	1	1
148B	Proctor silt loam, 2- to 4-percent slopes	51	IIe-1	64	1o1	1	1

GUIDE TO MAPPING UNITS (cont.)

Map symbol	Mapping unit	Description Page	Capability unit Symbol	Capability unit Page	Woodland group	Wildlife group	Recreation group
148C	Proctor silt loam, 4- to 7-percent slopes	51	IIe-1	64	1o1	1	1
148C2	Proctor silt loam, 4- to 7-percent slopes, moderately eroded	51	IIe-1	64	1o1	1	1
148D2	Proctor silt loam, 7- to 12-percent slopes, moderately eroded	51	IIIe-1	66	1o1	1	2
152	Drummer silty clay loam	30	IIw-1	65	2w3	5	6
171B	Catlin silt loam, 2- to 4-percent slopes	26	IIe-1	64	1o1	1	1
171C	Catlin silt loam, 4- to 7-percent slopes	26	IIe-1	64	1o1	1	1
171C2	Catlin silt loam, 4- to 7-percent slopes, moderately eroded	26	IIe-1	64	1o1	1	1
171D2	Catlin silt loam, 7- to 12-percent slopes, moderately eroded	26	IIIe-1	66	1o1	1	2
194C	Morley silt loam, 4- to 7-percent slopes	44	IIIe-2	67	2o1	1	1
194C2	Morley silt loam, 4- to 7-percent slopes, moderately eroded	44	IIIe-2	67	2o1	1	1
194D2	Morley silt loam, 7- to 12-percent slopes, moderately eroded	44	IIIe-2	67	2o1	1	2
194E2	Morley silt loam, 12- to 18-percent slopes, moderately eroded	44	IVe-2	69	2r2	2	3
198A	Elburn silt loam, 0- to 2-percent slopes	32	I-2	64	2o1	3	4
198B	Elburn silt loam, 2- to 4-percent slopes	32	IIe-2	65	2o1	3	4
199A	Plano silt loam, 0- to 2-percent slopes	50	I-1	64	1o1	1	1
199B	Plano silt loam, 2- to 4-percent slopes	50	IIe-1	64	1o1	1	1
199C	Plano silt loam, 4- to 7-percent slopes	50	IIe-1	64	1o1	1	1
199C2	Plano silt loam, 4- to 7-percent slopes, moderately eroded	50	IIe-1	64	1o1	1	1
206	Thorp silt loam	57	IIw-3	66	3w2	5	6
210	Lena muck	41	IIIw-1	68	2w5	5	7
219	Millbrook silt loam	43	I-2	64	2o1	3	4
221B	Parr silt loam, 2- to 4-percent slopes	49	IIe-1	64	2o1	1	1
221C	Parr silt loam, 4- to 7-percent slopes	49	IIe-1	64	2o1	1	1
221C2	Parr silt loam, 4- to 7-percent slopes, moderately eroded	49	IIe-1	64	2o1	1	1
221D2	Parr silt loam, 7- to 12-percent slopes, moderately eroded	49	IIIe-1	66	2o1	1	2
223C	Varna silt loam, 4- to 7-percent slopes	58	IIe-1	64	2o1	1	1
223C2	Varna silt loam, 4- to 7-percent slopes, moderately eroded	58	IIe-1	64	2o1	1	1
223D2	Varna silt loam, 7- to 12-percent slopes, moderately eroded	58	IIIe-2	67	2o1	1	2
227B	Argyle silt loam, 2- to 4-percent slopes	20	IIe-1	64	2o1	1	1
227C	Argyle silt loam, 4- to 7-percent slopes	20	IIe-1	64	2o1	1	1
227C2	Argyle silt loam, 4- to 7-percent slopes, moderately eroded	20	IIe-1	64	2o1	1	1
227D2	Argyle silt loam, 7- to 12-percent slopes, moderately eroded	20	IIIe-1	66	2o1	1	2
233B	Birkbeck silt loam, 2- to 4-percent slopes	24	IIe-1	64	1o1	1	1
233C2	Birkbeck silt loam, 4- to 7-percent slopes, moderately eroded	24	IIe-1	64	1o1	1	1
233D2	Birkbeck silt loam, 7- to 12-percent slopes, moderately eroded	24	IIIe-1	66	1o1	1	2
239	Dorchester silt loam	28	IIw-1	65	1o4	4	5
242A	Kendall silt loam, 0- to 2-percent slopes	40	IIw-2	66	2o1	3	4
242B	Kendall silt loam, 2- to 4-percent slopes	40	IIe-2	65	2o1	3	4
243A	St. Charles silt loam, 0- to 2-percent slopes	55	I-1	64	1o1	1	1
243B	St. Charles silt loam, 2- to 4-percent slopes	55	IIe-1	64	1o1	1	1
243C	St. Charles silt loam, 4- to 7-percent slopes	55	IIe-1	64	1o1	1	1
243C2	St. Charles silt loam, 4- to 7-percent slopes, moderately eroded	55	IIe-1	64	1o1	1	1
272	Edgington silt loam	32	IIw-3	66	3w2	5	6
278	Stronghurst silt loam	56	IIw-2	66	3o1	3	4
279A	Rozetta silt loam, 0- to 2-percent slopes	53	I-1	64	2o1	1	1
279B	Rozetta silt loam, 2- to 4-percent slopes	53	IIe-1	64	2o1	1	1
280B	Fayette silt loam, 2- to 4-percent slopes	33	IIe-1	64	2o1	1	1
280C	Fayette silt loam, 4- to 7-percent slopes	33	IIe-1	64	2o1	1	1
280C2	Fayette silt loam, 4- to 7-percent slopes, moderately eroded	33	IIe-1	64	2o1	1	1
280D	Fayette silt loam, 7- to 12-percent slopes	33	IIIe-1	66	2o1	1	2
280D2	Fayette silt loam, 7- to 12-percent slopes, moderately eroded	33	IIIe-1	66	2o1	1	2
280D3	Fayette soils, 7- to 12-percent slopes, severely eroded	33	IVe-1	68	2o1	1	2
280E2	Fayette silt loam, 12- to 30-percent slopes, moderately eroded	33	IVe-1	68	2r2	2	3
290C2	Warsaw silt loam, 4- to 7-percent slopes, moderately eroded	59	IIIe-3	67	2o1	6	1
290D2	Warsaw silt loam, 7- to 12-percent slopes, moderately eroded	59	IIIe-3	67	2o1	6	2
344A	Harvard silt loam, 0- to 2-percent slopes	36	I-1	64	1o1	1	1
344B	Harvard silt loam, 2- to 4-percent slopes	36	IIe-1	64	1o1	1	1
344C	Harvard silt loam, 4- to 7-percent slopes	36	IIe-1	64	1o1	1	1
344C2	Harvard silt loam, 4- to 7-percent slopes, moderately eroded	36	IIe-1	64	1o1	1	1
344D2	Harvard silt loam, 7- to 12-percent slopes, moderately eroded	36	IIIe-1	66	1o1	1	2
361D2	Kidder loam, 7- to 18-percent slopes, moderately eroded	41	IIIe-3	67	3o1	1	2
361D3	Kidder soils, 7- to 12-percent slopes, severely eroded	41	IVe-3	69	3o1	1	2
363D2	Griswold loam, 7- to 12-percent slopes, moderately eroded	36	IIIe-3	67	3o1	1	2
386A	Downs silt loam, 0- to 2-percent slopes	29	I-1	64	2o1	1	1
386B	Downs silt loam, 2- to 4-percent slopes	29	IIe-1	64	2o1	1	1

GUIDE TO MAPPING UNITS (cont.)

Map symbol	Mapping unit	Description	Capability unit		Woodland group	Wildlife group	Recreation group
		Page	Symbol	Page			
386C	Downs silt loam, 4- to 7-percent slopes	29	IIe-1	64	2o1	1	1
386C2	Downs silt loam, 4- to 7-percent slopes, moderately eroded	29	IIe-1	64	2o1	1	1
386D2	Downs silt loam, 7- to 12-percent slopes, moderately eroded	29	IIIe-1	66	2o1	1	2
410B	Woodbine silt loam, 2- to 4-percent slopes	59	IIe-1	64	2o1	1	1
410C	Woodbine silt loam, 4- to 7-percent slopes	59	IIe-1	64	2o1	1	1
410C2	Woodbine silt loam, 4- to 7-percent slopes, moderately eroded	59	IIe-1	64	2o1	1	1
410D	Woodbine silt loam, 7- to 12-percent slopes	59	IIIe-1	66	2o1	1	2
410D2	Woodbine silt loam, 7- to 12-percent slopes, moderately eroded	59	IIIe-1	66	2o1	1	2
410D3	Woodbine soils, 7- to 12-percent slopes, severely eroded	59	IVe-1	68	2o1	1	2
410E2	Woodbine silt loam, 12- to 18-percent slopes, moderately eroded	59	IVe-1	68	2r2	2	3
411B	Ashdale silt loam, 2- to 4-percent slopes	22	IIe-1	64	3o1	1	1
411C	Ashdale silt loam, 4- to 7-percent slopes	22	IIe-1	64	3o1	1	1
411C2	Ashdale silt loam, 4- to 7-percent slopes, moderately eroded	22	IIe-1	64	3o1	1	1
411D2	Ashdale silt loam, 7- to 12-percent slopes, moderately eroded	22	IIIe-1	66	3o1	1	2
412B	Ogle silt loam, 2- to 4-percent slopes	47	IIe-1	64	2o1	1	1
412C	Ogle silt loam, 4- to 7-percent slopes	47	IIe-1	64	2o1	1	1
412C2	Ogle silt loam, 4- to 7-percent slopes, moderately eroded	47	IIe-1	64	2o1	1	1
412D2	Ogle silt loam, 7- to 12-percent slopes, moderately eroded	47	IIIe-1	66	2o1	1	2
414B	Myrtle silt loam, 2- to 4-percent slopes	45	IIe-1	64	2o1	1	1
414C	Myrtle silt loam, 4- to 7-percent slopes	45	IIe-1	64	2o1	1	1
414C2	Myrtle silt loam, 4- to 7-percent slopes, moderately eroded	45	IIe-1	64	2o1	1	1
414D2	Myrtle silt loam, 7- to 12-percent slopes, moderately eroded	45	IIIe-1	66	2o1	1	2
415	Orion silt loam	48	I-2	64	2o4	4	5
416B	Durand silt loam, 2- to 4-percent slopes	31	IIe-1	64	2o1	1	1
416C	Durand silt loam, 4- to 7-percent slopes	31	IIe-1	64	2o1	1	1
416C2	Durand silt loam, 4- to 7-percent slopes, moderately eroded	31	IIe-1	64	2o1	1	1
416D2	Durand silt loam, 7- to 12-percent slopes, moderately eroded	31	IIIe-1	66	2o1	1	2
417C2	Derinda silt loam, 4- to 7-percent slopes, moderately eroded	27	IIIe-2	67	3o1	1	1
417D2	Derinda silt loam, 7- to 12-percent slopes, moderately eroded	27	IVe-2	69	3o1	1	2
417D3	Derinda soils, 7- to 12-percent slopes, severely eroded	27	VIe-1	70	3o1	1	2
417E2	Derinda silt loam, 12- to 18-percent slopes, moderately eroded	27	VIe-1	70	3r2	6	3
418C2	Schapville silt loam, 4- to 7-percent slopes, moderately eroded	54	IIIe-2	67	3o1	1	1
418D2	Schapville silt loam, 7- to 12-percent slopes, moderately eroded	54	IVe-2	69	3o1	1	2
419B	Flagg silt loam, 2- to 4-percent slopes	35	IIe-1	64	2o1	1	1
419C	Flagg silt loam, 4- to 7-percent slopes	35	IIe-1	64	2o1	1	1
419C2	Flagg silt loam, 4- to 7-percent slopes, moderately eroded	35	IIe-1	64	2o1	1	1
419D2	Flagg silt loam, 7- to 12-percent slopes, moderately eroded	35	IIIe-1	66	2o1	1	2
429B	Palsgrove silt loam, 2- to 4-percent slopes	49	IIe-1	64	3o1	1	1
429C	Palsgrove silt loam, 4- to 7-percent slopes	49	IIe-1	64	3o1	1	1
429C2	Palsgrove silt loam, 4- to 7-percent slopes, moderately eroded	49	IIe-1	64	3o1	1	1
429D	Palsgrove silt loam, 7- to 12-percent slopes	49	IIIe-1	66	3o1	1	2
429D2	Palsgrove silt loam, 7- to 18-percent slopes, moderately eroded	49	IIIe-1	66	3o1	1	2
451	Lawson silt loam	41	I-2	64	2o4	4	5
504D2	Sogn silt loam, 7- to 18-percent slopes, moderately eroded	55	VIIs-1	71	3s3	6	2
504F2	Sogn silt loam, 18- to 50-percent slopes, moderately eroded	55	VIIs-1	71	3s3	6	3
506B	Hitt silt loam, 2- to 4-percent slopes	37	IIe-1	64	3o1	1	1
506C	Hitt silt loam, 4- to 7-percent slopes	37	IIe-1	64	3o1	1	1
506C2	Hitt silt loam, 4- to 7-percent slopes, moderately eroded	37	IIe-1	64	3o1	1	1
506D2	Hitt silt loam, 7- to 12-percent slopes, moderately eroded	37	IIIe-1	66	3o1	1	2
546B	Keltner silt loam, 2- to 4-percent slopes	39	IIe-1	64	3o1	1	1
546C	Keltner silt loam, 4- to 7-percent slopes	39	IIe-1	64	3o1	1	1
546C2	Keltner silt loam, 4- to 7-percent slopes, moderately eroded	39	IIe-1	64	3o1	1	1
546D2	Keltner silt loam, 7- to 12-percent slopes, moderately eroded	39	IIIe-1	66	3o1	1	2
547B	Eleroy silt loam, 2- to 4-percent slopes	33	IIe-1	64	3o1	1	1
547C	Eleroy silt loam, 4- to 7-percent slopes	33	IIe-1	64	3o1	1	1
547C2	Eleroy silt loam, 4- to 7-percent slopes, moderately eroded	33	IIe-1	64	3o1	1	1
547D2	Eleroy silt loam, 7- to 12-percent slopes, moderately eroded	33	IIIe-1	66	3o1	1	2
572B	Loran silt loam, 2- to 4-percent slopes	42	IIe-2	65	3o1	3	4
572C	Loran silt loam, 4- to 7-percent slopes	42	IIe-2	65	3o1	3	4
578	Dorchester silt loam, cobbly subsoil variant	29	IIw-1	65	1o4	4	5
656C2	Octagon silt loam, 4- to 7-percent slopes, moderately eroded	46	IIe-1	64	2o1	1	1
656D2	Octagon silt loam, 7- to 12-percent slopes, moderately eroded	46	IIIe-1	66	2o1	1	2
731B	Nasset silt loam, 2- to 4-percent slopes	46	IIe-1	64	3o1	1	1
731C	Nasset silt loam, 4- to 7-percent slopes	46	IIe-1	64	3o1	1	1
731C2	Nasset silt loam, 4- to 7-percent slopes, moderately eroded	46	IIe-1	64	3o1	1	1

GUIDE TO MAPPING UNITS (concluded)

Map symbol	Mapping unit	Description	Capability unit		Woodland group	Wildlife group	Recreation group
		Page	Symbol	Page			
731D2	Nasset silt loam, 7- to 12-percent slopes, moderately eroded....	46	IIIe-1	66	3o1	1	2
743B	Ridott silt loam, 2- to 4-percent slopes......................	51	IIe-2	65	3o1	3	4
743C	Ridott silt loam, 4- to 7-percent slopes......................	51	IIe-2	65	3o1	3	4
745B	Shullsburg silt loam, 2- to 4-percent slopes....................	55	IIIe-4	68	3o1	3	4
745C	Shullsburg silt loam, 4- to 7-percent slopes....................	55	IIIe-4	68	3o1	3	4
745C2	Shullsburg silt loam, 4- to 7-percent slopes, moderately eroded..	55	IIIe-4	68	3o1	3	4
745D2	Shullsburg silt loam, 7- to 12-percent slopes, moderately eroded..	55	IVe-4	70	3o1	3	4
746B	Calamine silt loam, 1- to 3-percent slopes.....................	25	IIw-1	65	3w2	5	6
752C	Oneco silt loam, 4- to 7-percent slopes.......................	47	IIe-1	64	3o1	1	1
752C2	Oneco silt loam, 4- to 7-percent slopes, moderately eroded......	47	IIe-1	64	3o1	1	1
752D2	Oneco silt loam, 7- to 12-percent slopes, moderately eroded....	47	IIIe-1	66	3o1	1	2
753B	Massbach silt loam, 2- to 4-percent slopes.....................	42	IIe-1	64	3o1	1	1
753C	Massbach silt loam, 4- to 7-percent slopes.....................	42	IIe-1	64	3o1	1	1
753C2	Massbach silt loam, 4- to 7-percent slopes, moderately eroded..	42	IIe-1	64	3o1	1	1
753D2	Massbach silt loam, 7- to 12-percent slopes, moderately eroded..	42	IIIe-1	66	3o1	1	2
969D2	Rodman-Casco complex, 7- to 12-percent slopes, moderately eroded...	52	VIs-1	70	3s3	6	2
969E2	Rodman-Casco complex, 12- to 30-percent slopes, moderately eroded...	52	VIs-1	70	3s3	6	3
970C2	Keller-Coatsburg complex, 4- to 7-percent slopes, moderately eroded...	38	IIIe-4	68	3o1	3	4
970D2	Keller-Coatsburg complex, 7- to 12-percent slopes, moderately eroded...	38	IVe-4	70	3o1	3	4
971C2	Fishhook-Atlas complex, 4- to 7-percent slopes, moderately eroded...	34	IIIe-4	68	3o1	3	4
971D2	Fishhook-Atlas complex, 7- to 12-percent slopes, moderately eroded...	34	IVe-4	70	3o1	3	4
972C2	Casco-Fox complex, 4- to 7-percent slopes, moderately eroded..	26	IIIe-3	67	3s3	6	2
972D2	Casco-Fox complex, 7- to 12-percent slopes, moderately eroded..	26	IVe-3	69	3s3	6	2
972E2	Casco-Fox complex, 12- to 18-percent slopes, moderately eroded	26	VIs-1	70	3s3	6	3
973D3	Dubuque and Dunbarton silty clay loams, 7- to 12-percent slopes, severely eroded.......................................	31	VIe-1	70	3o1	6	2
973E2	Dubuque and Dunbarton silt loams, 12- to 18-percent slopes, moderately eroded....................................	31	VIe-1	70	3r2	6	3
973E3	Dubuque and Dunbarton silty clay loams, 12- to 18-percent slopes, severely eroded.................................	31	VIIs-1	71	3r2	6	3
973F2	Dubuque and Dunbarton silt loams, 18- to 30-percent slopes, moderately eroded....................................	31	VIIs-1	71	3r2	6	3

SOIL REPORTS PUBLISHED

Adams, 24
Alexander (see Pulaski)
Bond, 8
Boone, 65
Bureau, 20*
Calhoun, 53
Carroll, 98
Cass, 71
Champaign, 18
Champaign-Urbana area of Champaign County, 100
Christian, 73
Clay, 1
Clinton, 57
Coles, 44
Cumberland, 69
DeKalb, 23*
DeWitt, 67
Douglas, 89**
Du Page, 16
Edgar, 15
Edwards-Richland, 90**
Effingham, 48
Fayette, 52
Ford, 54
Fulton, 51
Gallatin, 87
Greene, 93
Grundy, 26
Hancock, 27
Hardin (see Pope)
Henderson, 77
Henry, 41
Iroquois, 74**
Jackson, 55*
Jasper, 68
Jersey, 84
Johnson, 82**
Kane, 17
Kankakee, 13
Kendall, 75
Knox, 6
Lake, 88**
La Salle, 91**
Lawrence, 78
Lee, 37
Livingston, 72**
Logan, 92**
Macon, 45
Macoupin, 50
Marion, 34
Marshall, 59
Mason, 28
Massac (see Pope)
McDonough, 7
McHenry, 81**
McLean, 10
Menard, 76
Mercer, 29
Montgomery, 86
Morgan, 42
Moultrie, 2
Ogle, 38
Peoria, 19
Piatt, 47
Pike, 11
Pope-Hardin-Massac, 94**
Pulaski-Alexander, 85
Putnam, 60
Randolph, 32
Richland (see Edwards)
Rock Island, 31
Saline, 33
Sangamon, 4
Schuyler, 56
Shelby, 66*
St. Clair, 63
Stark, 64
Stephenson, 99
Tazewell, 14
Vermilion, 62*
Wabash, 83**
Warren, 70*
Washington, 58
Wayne, 49
Whiteside, 40
Will, 80**
Williamson, 79
Winnebago, 12*
Woodford, 36

* No longer available for distribution.
** Soil Report No. 72 for Livingston County replaces No. 25, No. 74 for Iroquois County replaces No. 22, No. 80 for Will County replaces No. 35, No. 81 for McHenry County replaces No. 21, No. 82 for Johnson County replaces No. 30, No. 83 for Wabash County replaces No. 61, No. 88 for Lake County replaces No. 9, No. 89 for Douglas County replaces No. 43, No. 90 for Edwards County replaces No. 46, No. 91 for La Salle County replaces No. 5, No. 92 for Logan County replaces No. 39, and No. 94 for Hardin County replaces No. 3.

Much new information about soils has been obtained since the printing of the older soil maps and reports in the above list, especially numbers 1 to 53, which were issued before 1933. For many areas this newer information is needed if the maps and other soil information in the reports are to be correctly interpreted. Help in making these interpretations can be obtained by writing to the Department of Agronomy, University of Illinois, Urbana 61801.

4M—4-76—31712

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.