

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (5). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (*Ust*, meaning intermittently dry, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustolls (*Hapl*, meaning minimal horizonation, plus *ustoll*, the suborder of the Mollisols that has an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplustolls.

FAMILY. Families are established within a subgroup

on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplustolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (7). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (5). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Albaton Series

The Albaton series consists of very deep, poorly drained and very poorly drained, very slowly permeable soils on bottom land. These soils formed in stratified,

calcareous, clayey alluvium. Slopes range from 0 to 2 percent.

Albaton soils are commonly adjacent to Fluvaquents and to Gibbon, Inavale, Kezan, and Onawa soils. Fluvaquents are covered by shallow water. They are lower on the landscape than the Albaton soils. Gibbon and Onawa soils are somewhat poorly drained. Inavale soils are sandy and excessively drained. Gibbon, Onawa, and Inavale soils are higher on the landscape than the Albaton soils. Gibbon and Kezan soils contain more silt and less clay throughout than the Albaton soils. Onawa soils have less clay in the lower part of the profile than the Albaton soils. Kezan soils are poorly drained. They are slightly higher on the landscape than the Albaton soils.

Typical pedon of Albaton silty clay, 0 to 2 percent slopes, 85 feet west and 2,430 feet south of the northeast corner of sec. 34, T. 33 N., R. 7 W.

Ap—0 to 6 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; weak fine subangular blocky structure parting to very fine granular; very hard, very firm; strong effervescence; mildly alkaline; abrupt smooth boundary.

Cg1—16 to 12 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong fine angular blocky structure; very hard, very firm; thin strata of very fine sandy loam; dark organic coatings on vertical faces of peds; strong effervescence; mildly alkaline; clear smooth boundary.

Cg2—12 to 25 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; few fine prominent dark brown (7.5YR 4/4 moist) mottles; moderate medium angular blocky structure; very hard, very firm; dark organic coatings on vertical faces of peds; strong effervescence; mildly alkaline; gradual wavy boundary.

Cg3—25 to 48 inches; gray (5Y 6/1) clay, dark gray (5Y 4/1) moist; many medium prominent strong brown (7.5YR 5/6 moist) mottles; weak coarse subangular blocky and moderate thin platy structure; very hard, very firm; dark organic coatings on faces of peds; strong effervescence; mildly alkaline; gradual wavy boundary.

Cg4—48 to 60 inches; stratified light gray (5Y 6/1) and light olive gray (5Y 6/2) silty clay, gray (5Y 5/1) and olive gray (5Y 4/2) moist; common fine prominent strong brown (7.5YR 5/6 moist) mottles; weak thin platy structure; very hard, very firm; strong effervescence; moderately alkaline.

The control section is calcareous. In most pedons the

soil at or near the surface also is calcareous.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5 (3 moist), and chroma of 1 or 2. It is dominantly silty clay, but the range includes silty clay loam and clay. The Cg horizon has hue of 5Y or 2.5Y or is neutral in hue. It has value of 5 or 6 (4 or 5 moist) and chroma of 0 to 2.

Alcester Series

The Alcester series consists of very deep, well drained, moderately permeable soils on foot slopes. These soils formed in silty colluvial and alluvial sediments. Slopes range from 2 to 11 percent.

Alcester soils are commonly adjacent to Betts, Crofton, and Nora soils. Betts and Crofton soils do not have a mollic epipedon. They are calcareous throughout. Betts soils formed in glacial till. Crofton soils formed in loess on the higher upland side slopes. Nora soils have a mollic epipedon less than 20 inches thick. They are on uplands above the Alcester soils.

Typical pedon of Alcester silt loam, 2 to 6 percent slopes, 820 feet south and 270 feet west of the northeast corner of sec. 21, T. 32 N., R. 3 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary.

A1—7 to 10 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to weak thin platy; slightly hard, friable; neutral; clear smooth boundary.

A2—10 to 23 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable; neutral; gradual wavy boundary.

Bw1—23 to 36 inches; brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; neutral; gradual wavy boundary.

Bw2—36 to 43 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; neutral; gradual wavy boundary.

Bw3—43 to 50 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; neutral; gradual wavy boundary.

Bk—50 to 60 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak medium

prismatic structure; hard, firm; few fine accumulations of lime; strong effervescence; moderately alkaline.

The mollic epipedon is 24 to 50 inches thick. It extends into the B horizon.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is dominantly silt loam, but the range includes silty clay loam. The Bw horizon has value of 4 or 5 (2 to 4 moist) and chroma of 2 or 3. It is silt loam or silty clay loam. The Bk horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is silt loam or silty clay loam.

Aowa Series

The Aowa series consists of very deep, well drained, moderately permeable soils on bottom land. These soils formed in stratified, calcareous, silty alluvium. Slopes range from 0 to 2 percent.

Aowa soils are commonly adjacent to Alcester, Kezan, Hord, and Shell soils. Alcester, Hord, and Shell soils are higher on the landscape than the Aowa soils. Alcester and Hord soils are not stratified. They have carbonates below a depth of 24 inches. Shell soils are stratified at a lower depth than the Aowa soils. They have a thick mollic epipedon and are noncalcareous. Kezan soils are poorly drained. They are lower on the landscape than the Aowa soils.

Typical pedon of Aowa silt loam, 0 to 2 percent slopes, 1,000 feet south and 75 feet east of the northwest corner of sec. 17, T. 29 N., R. 4 W.

- Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; dominantly weak very fine granular structure but some moderate thin platy structure in places because of stratification; slightly hard, friable; common fine roots; slight effervescence; mildly alkaline; abrupt smooth boundary.
- C—7 to 30 inches; stratified grayish brown (10YR 5/2) and pale brown (10YR 6/3) silt loam, very dark grayish brown (10YR 3/2) and brown (10YR 4/3) moist; weak thick platy structure; slightly hard, friable; slight effervescence; mildly alkaline; clear smooth boundary.
- Ab—30 to 54 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine and very fine granular structure; slightly hard, friable; few very fine roots; mildly alkaline; gradual smooth boundary.
- C'—54 to 60 inches; stratified grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) silt loam, dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) moist; dominantly massive but

platy structure in places because of stratification; slightly hard, friable; few very fine roots; mildly alkaline.

Carbonates are typically in the upper part of the profile. Some pedons are calcareous to a depth of 60 inches.

After mixing, the Ap horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 to 3. It is dominantly silt loam, but the range includes silty clay loam. The C horizon has light and dark strata. It has value of 3 to 6 (3 to 5 moist) and chroma of 1 to 3. It is dominantly silt loam, but the range includes loam and silty clay loam. Some pedons have strata of fine sandy loam and silty clay. The Ab horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is typically below a depth of 24 inches and is silt loam or silty clay loam.

Barney Series

The Barney series consists of very deep, poorly drained soils on flood plains along streams and rivers. These soils formed in loamy alluvium over sand (fig. 16). Permeability is moderate in the surface soil and rapid in the underlying material. Slopes range from 0 to 2 percent.

Barney soils are commonly adjacent to Boel, Inavale, and Orwet soils and to small areas of Fluvaquents. Boel and Orwet soils are higher on the landscape than the Barney soils. Boel soils are somewhat poorly drained. Orwet soils are poorly drained and have a mollic epipedon. Inavale soils are excessively drained. They are in the highest areas of bottom land. Fluvaquents are covered by shallow water for most of the year.

Typical pedon of Barney loam, 0 to 2 percent slopes, 500 feet south and 100 feet west of the northeast corner of sec. 24, T. 30 N., R. 7 W.

- A—0 to 7 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; common fine distinct strong brown (7.5YR 5/6 moist) mottles; weak thin platy structure; slightly hard, friable; few thin strata of finer or coarser textures; strong effervescence; moderately alkaline; clear smooth boundary.
- AC—7 to 10 inches; gray (10YR 6/1) loam, dark gray (10YR 4/1) moist; common fine prominent strong brown (7.5YR 5/6 moist) mottles; weak thin platy structure; slightly hard, friable; few thin strata of finer or coarser textures; strong effervescence; moderately alkaline; clear smooth boundary.
- C1—10 to 30 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; single grain; loose; few thin strata of silt loam; mildly alkaline; clear smooth boundary.

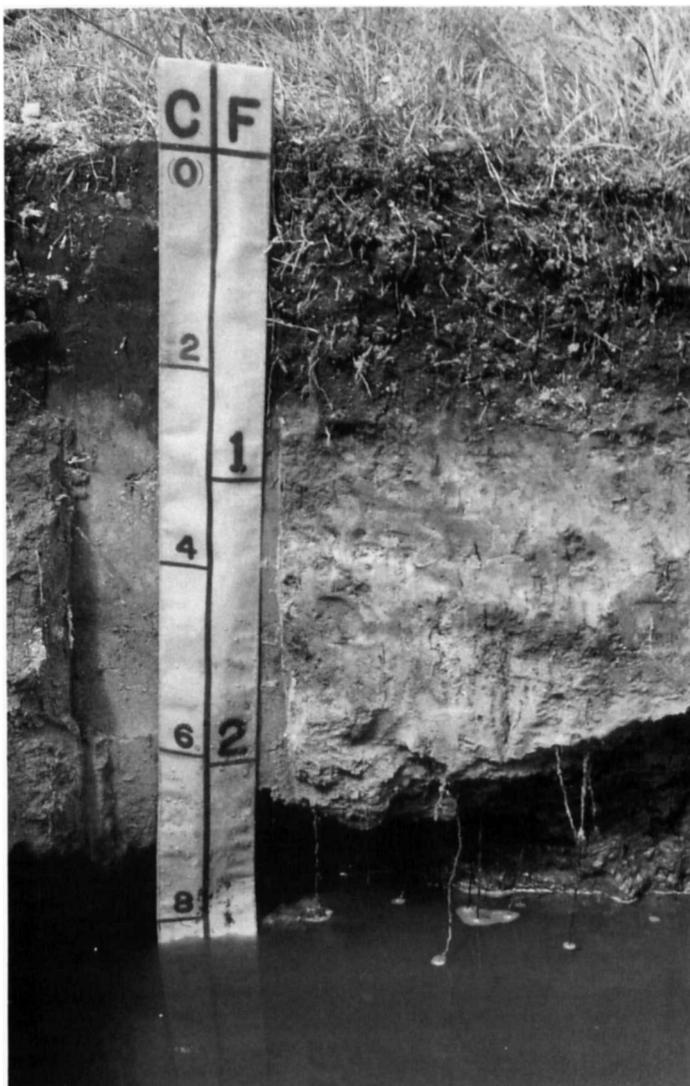


Figure 16.—Profile of a Barney loam. The water table is at a depth of about 30 inches.

C2—30 to 60 inches; light gray (10YR 7/2) sand, light brownish gray (10YR 6/2) moist; single grain; loose; 2 to 3 percent gravel, by volume; mildly alkaline.

The A horizon has hue of 10YR, value of 3 to 5 (2 or 3 moist), and chroma of 1 or 2. It is stratified loam, fine sandy loam, loamy fine sand, or fine sand. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 or 2. It is fine sand, sand, or coarse sand that is finely stratified with finer and coarser textures. It has faint to distinct brownish and grayish mottles.

Bazile Series

The Bazile series consists of very deep, well drained, moderately slowly permeable to rapidly permeable soils on uplands and stream terraces. These soils formed in loess or outwash material over sandy sediments. Slopes range from 0 to 11 percent.

Bazile soils are commonly adjacent to Moody, Paka, Simeon, Thurman, and Trent soils. Moody, Paka, and Trent soils formed in loamy and silty materials more than 40 inches thick. Trent soils have a mollic epipedon more than 20 inches thick. They are in the lower landscape positions near the head of upland drainageways or in upland swales. Simeon and Thurman soils have a control section that is coarser textured than that of the Bazile soils. They are excessively drained and somewhat excessively drained. Thurman soils are slightly higher on the landscape than the Bazile soils.

Typical pedon of Bazile loam, 0 to 2 percent slopes, 1,320 feet south and 50 feet east of the northwest corner of sec. 29, T. 29 N., R. 8 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate fine and very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—6 to 16 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable; medium acid; clear smooth boundary.

Bt1—16 to 19 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; hard, firm; slightly acid; clear smooth boundary.

Bt2—19 to 27 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine subangular blocky structure; hard, firm; neutral; clear smooth boundary.

BC—27 to 30 inches; pale brown (10YR 6/3) clay loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; slightly hard, friable; neutral; abrupt smooth boundary.

2C—30 to 60 inches; very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; loose; neutral.

The thickness of the solum and the depth to sand range from 20 to 40 inches. The mollic epipedon is 7 to 20 inches thick. It includes the upper part of the B horizon in some pedons. In some areas the lower part

of the B horizon is calcareous and contains small accumulations of lime.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 2. It is typically loam, but the range includes silt loam, silty clay loam, clay loam, loamy fine sand, and fine sand. The Bt horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is typically silty clay loam, but the range includes silt loam and clay loam. The 2C horizon has value of 6 to 8 (5 to 7 moist) and chroma of 2 or 3. It ranges from loamy fine sand to sand.

Betts Series

The Betts series consists of very deep, well drained soils on uplands. These soils formed in glacial till. Permeability is moderate in the solum and moderately slow in the underlying material. Slopes range from 6 to 60 percent.

Betts soils are commonly adjacent to Alcester, Crofton, Nora, Simeon, and Thurman soils. Alcester soils have a mollic epipedon more than 20 inches thick. They are leached of lime. They are on foot slopes. Crofton soils formed in calcareous, silty loess. They are commonly slightly higher on the landscape than the Betts soils. Nora soils have a mollic epipedon. They formed in silty loess. They are in landscape positions similar to those of the Betts soils. Simeon and Thurman soils are sandy. They are higher on the landscape than the Betts soils.

Typical pedon of Betts clay loam, 15 to 30 percent slopes, 850 feet east and 2,000 feet north of the southwest corner of sec. 9, T. 32 N., R. 4 W.

- A—0 to 5 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable; few pebbles; strong effervescence; moderately alkaline; clear smooth boundary.
- Bw—5 to 11 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; weak fine prismatic structure parting to weak fine subangular blocky; slightly hard, friable; few pebbles; violent effervescence; few fine concretions of lime; moderately alkaline; clear smooth boundary.
- BCK—11 to 26 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; common medium prominent reddish yellow (7.5YR 7/8) relict mottles; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few pebbles; violent effervescence; many medium accumulations and concretions of lime; moderately alkaline; gradual wavy boundary.
- C1—26 to 37 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; common

medium prominent reddish yellow (7.5YR 7/8 moist) relict mottles; weak medium prismatic structure; hard, firm; few pebbles; violent effervescence; few fine accumulations and concretions of lime; moderately alkaline; clear smooth boundary.

- C2—37 to 60 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; many coarse prominent reddish yellow (7.5YR 6/8) relict mottles; massive; hard, firm; few pebbles; violent effervescence; few fine accumulations and concretions of lime; moderately alkaline.

The depth to carbonates ranges from 0 to 3 inches. The control section is clay loam or loam. It has 20 to 35 percent clay.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 6 (2 to 5 moist), and chroma of 1 to 3. It is clay loam or loam. The Bw horizon has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It is clay loam or loam. The C horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It has few to many faint to prominent relict mottles.

Blendon Series

The Blendon series consists of very deep, well drained soils on stream terraces and upland valleys. These soils formed in loamy and sandy glacial or eolian sediments. Permeability is moderately rapid in the solum and rapid in the underlying material. Slopes range from 0 to 2 percent.

Blendon soils are commonly adjacent to Bazile, Loretto, Ortello, and Thurman soils. Bazile, Loretto, Ortello, and Thurman soils are in the higher landscape positions. They have a mollic epipedon less than 20 inches thick. Bazile and Loretto soils have more clay in the solum than the Blendon soils. Thurman soils have less clay in the solum than the Blendon soils.

Typical pedon of Blendon fine sandy loam, 0 to 2 percent slopes, 1,740 feet south and 60 feet east of the northwest corner of sec. 28, T. 32 N., R. 8 W.

- Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; slightly hard, friable; common very fine roots; medium acid; abrupt smooth boundary.
- A—7 to 16 inches; very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; slightly hard, friable; common very fine roots; medium acid; gradual wavy boundary.
- Bw—16 to 30 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting

to weak medium subangular blocky; soft, very friable; few very fine roots; slightly acid; clear wavy boundary.

C1—30 to 45 inches; grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure; soft, very friable; few very fine roots; neutral; gradual wavy boundary.

C2—45 to 60 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; single grain; loose; neutral.

The thickness of the mollic epipedon and the thickness of the solum range from 20 to 50 inches. Free carbonates are at a depth of more than 60 inches.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam. The Bw horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is fine sandy loam or sandy loam. The C horizon has value of 5 to 7 (3 to 5 moist) and chroma of 2 or 3. It typically is loamy fine sand or loamy sand, but the range includes sandy loam, fine sandy loam, fine sand, and sand.

Blyburg Series

The Blyburg series consists of very deep, well drained, moderately permeable soils on bottom land along the Missouri River. These soils formed in stratified, calcareous alluvium. Slopes range from 0 to 2 percent.

Blyburg soils are commonly adjacent to Aowa, Inavale, Onawa, Shell, and Solomon soils. Aowa soils have a stratified surface layer. They have more clay in the control section than the Blyburg soils. Inavale soils are sandy in the control section. Onawa soils are silty clay in the upper part of the control section. They are somewhat poorly drained. Shell soils are noncalcareous and have a very thick, dark surface layer. They are in the slightly higher landscape positions. Solomon soils are silty clay throughout. They are poorly drained. Onawa and Solomon soils are lower on the landscape than the Blyburg soils.

The Blyburg soils in this county are taxadjuncts because they receive less rainfall than is typical for the series and because they have carbonates at the surface. These differences, however, do not affect the use and management of the soils.

Typical pedon of Blyburg silt loam, 0 to 2 percent slopes, 1,330 feet north and 36 feet east of the southwest corner of sec. 17, T. 33 N., R. 7 W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable;

slight effervescence; moderately alkaline; abrupt smooth boundary.

A—7 to 12 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; strong effervescence; moderately alkaline; clear smooth boundary.

C—12 to 60 inches; light gray (2.5Y 7/2), stratified very fine sandy loam and silt loam, grayish brown (2.5Y 5/2) moist; many fine prominent reddish yellow (7.5YR 7/8 moist) relict mottles; dominantly massive but thick to thin platy structure in places because of stratification; soft, very friable; few streaks and threads of disseminated lime; violent effervescence; moderately alkaline.

The depth to free carbonates ranges from 0 to 6 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It typically is silt loam, but the range includes silty clay loam and very fine sandy loam. The C horizon has hue of 10YR or 2.5Y, value of 6 or 7 (4 or 5 moist), and chroma of 2 or 3.

Boel Series

The Boel series consists of very deep, somewhat poorly drained, rapidly permeable soils on bottom land. These soils formed in sandy alluvium. Slopes range from 0 to 2 percent.

Boel soils are commonly adjacent to Barney, Inavale, Ord, and Orwet soils. Barney and Orwet soils are slightly lower on the landscape than the Boel soils. They are poorly drained or very poorly drained. Inavale soils are slightly higher on the landscape than the Boel soils. They are excessively drained. Ord soils are in landscape positions similar to those of the Boel soils. They have more silt and clay in the upper part of the control section than the Boel soils.

Typical pedon of Boel loamy fine sand, 0 to 2 percent slopes, 1,310 feet south and 800 feet east of the northwest corner of sec. 30, T. 32 N., R. 6 W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; neutral; abrupt smooth boundary.

A—7 to 15 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; neutral; clear wavy boundary.

AC—15 to 18 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2)

moist; weak very fine granular structure; soft, very friable; neutral; clear smooth boundary.

- C1—18 to 27 inches; very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; single grain; loose; neutral; gradual smooth boundary.
- C2—27 to 34 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; few fine prominent reddish yellow (7.5YR 6/6 moist) mottles; single grain; loose; mildly alkaline; gradual smooth boundary.
- C3—34 to 50 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; common medium prominent reddish yellow (7.5YR 6/6 moist) mottles; single grain; loose; thin strata of silty material; mildly alkaline; gradual smooth boundary.
- C4—50 to 60 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; many medium prominent strong brown (7.5YR 4/6 moist) mottles; single grain; loose; thin strata of silty material; mildly alkaline.

The mollic epipedon ranges from 10 to 20 inches in thickness. The depth to carbonates is typically more than 60 inches, but some pedons may have thin layers that contain carbonates.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is loamy fine sand or fine sandy loam. The AC horizon has value of 3 to 5 (2 or 3 moist) and chroma of 2. It is loamy fine sand or fine sandy loam. The C horizon has value of 6 to 8 (5 to 7 moist) and chroma of 2 or 3. It is coarse sand, fine sand, or loamy fine sand. It has brownish, reddish, or yellowish mottles. It has strata of coarser or finer textured sediments.

Boelus Series

The Boelus series consists of very deep, well drained soils on uplands and stream terraces. These soils formed in sandy eolian material over loamy sediments. Permeability is rapid in the sandy upper part and moderate in the loamy lower part. Slopes range from 0 to 11 percent.

Boelus soils are commonly adjacent to Loretto, Moody, Nora, Ortello, Paka, and Thurman soils. Loretto, Nora, Moody, Paka, and Ortello soils are in landscape positions similar to those of the Boelus soils. Loretto soils have less sand in the upper part of the solum than the Boelus soils. Nora, Moody, and Paka soils have more clay in the surface soil and the upper part of the subsoil than the Boelus soils. Ortello soils have more sand in the lower part of the profile than the Boelus soils. Thurman soils have sandy material throughout. They are somewhat excessively drained. They are higher on the landscape than the Boelus soils.

Typical pedon of Boelus loamy sand, 2 to 6 percent slopes, 1,230 feet south and 900 feet east of the northwest corner of sec. 15, T. 29 N., R. 8 W.

- Ap—0 to 6 inches; grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; weak very fine crumb structure; soft, very friable; medium acid; abrupt smooth boundary.
- A—6 to 11 inches; dark grayish brown (10YR 4/2) loamy sand, very dark grayish brown (10YR 3/2) moist; weak very fine crumb structure; soft, very friable; medium acid; clear wavy boundary.
- Bw1—11 to 24 inches; grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak very fine crumb structure; soft, very friable; slightly acid; clear wavy boundary.
- 2Bw2—24 to 32 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium and fine subangular blocky structure; hard, firm; neutral; gradual wavy boundary.
- 2Bw3—32 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure; slightly hard, friable; neutral; gradual wavy boundary.
- 2C—40 to 60 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable; neutral.

The thickness of the mollic epipedon ranges from 10 to 20 inches. Depth to the 2B horizon ranges from 20 to 40 inches. The thickness of the solum ranges from 32 to 60 inches. The depth to free carbonates ranges from 36 to more than 60 inches.

The A horizon has value of 3 to 5 (2 to 4 moist) and chroma of 1 to 3. It is typically loamy sand, but the range includes loamy fine sand. The Bw horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is typically loamy sand, but the range includes loamy fine sand and sand. The 2B horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is typically silty clay loam, but the range includes sandy clay loam, silt loam, and loam. The 2C horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7 (4 to 6 moist) and chroma of 2 to 4. It is typically silt loam, but the range includes silty clay loam, sandy clay loam, loam, and very fine sand.

Bristow Series

The Bristow series consists of shallow, well drained, slowly permeable soils on uplands. These soils formed in light colored, calcareous shale bedrock. Slopes range from 11 to 60 percent.

Bristow soils are commonly adjacent to Gavins, Labu, Lynch, Sansarc, and Verdel soils. Gavins soils

are less than 20 inches deep over siltstone bedrock. They contain less clay than the Bristow soils. Also, they are lower on the landscape. Labu and Lynch soils are 20 to 40 inches deep over shale bedrock. Sansarc soils are less than 20 inches deep over dark shale bedrock. They contain less gypsum than the Bristow soils. Labu and Sansarc soils are slightly higher on the landscape than the Bristow soils. Lynch soils are slightly lower on the landscape than the Bristow soils. Verdel soils have a thick mollic epipedon. They have shale bedrock at a depth of more than 60 inches. They are on the lower foot slopes and stream terraces.

Typical pedon of Bristow silty clay, 30 to 60 percent slopes, 930 feet east and 100 feet north of the southwest corner of sec. 33, T. 33 N., R. 7 W.

A1—0 to 3 inches; light olive brown (2.5Y 5/4) silty clay, olive brown (2.5Y 4/4) moist; moderate medium subangular blocky structure parting to weak fine granular; hard, firm; about 2 percent, by volume, shale channers; common very fine roots; strong effervescence; moderately alkaline; clear wavy boundary.

A2—3 to 6 inches; light olive brown (2.5Y 5/4) silty clay, olive brown (2.5Y 4/4) moist; moderate coarse subangular blocky structure; hard, firm; about 2 percent, by volume, shale channers; common very fine roots; strong effervescence; moderately alkaline; clear wavy boundary.

C—6 to 16 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; massive parting to weak thin platy structure; very hard, very firm; about 30 percent, by volume, shale channers; accumulations of calcium carbonate and gypsum; few very fine roots; violent effervescence; moderately alkaline; clear wavy boundary.

Cr—16 to 60 inches; pale yellow (2.5Y 7/4) shale bedrock, light olive brown (2.5Y 5/4) moist; massive parting to strong coarse shale fragments; accumulations of calcium carbonate and gypsum in the seams and fractures of the shale; strong effervescence; moderately alkaline.

The depth to shale bedrock ranges from 5 to 20 inches. The calcium carbonate equivalent ranges from 15 to 25 percent. The content of carbonate-free clay ranges from 38 to 55 percent in the control section.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 4. It is dominantly silty clay, but the range includes clay. The C and Cr horizons have hue of 10YR or 2.5Y, value of 6 to 8 (4 to 6 moist), and chroma of 4 to 6. Accumulations of calcium carbonate and gypsum are in the seams and fractures.

Brunswick Series

The Brunswick series consists of moderately deep, well drained, moderately rapidly permeable soils on uplands. These soils formed in material weathered from weakly cemented sandstone bedrock. Slopes range from 6 to 30 percent.

Brunswick soils are commonly adjacent to Crofton, Mariaville, Meadin, Paka, and Thurman soils. Crofton and Mariaville soils are in landscape positions similar to those of the Brunswick soils. Crofton soils formed in deep, calcareous, silty material. Mariaville soils contain more clay than the Brunswick soils. They have soft siltstone bedrock at a depth of 10 to 20 inches. Meadin and Thurman soils are higher on the landscape than the Brunswick soils. Meadin soils have gravelly coarse sand at a depth of 8 to 20 inches. Thurman soils have a very deep, sandy profile. Paka soils are in the slightly higher positions on the landscape. They have more clay throughout than the Brunswick soils. They have a mollic epipedon.

Typical pedon of Brunswick fine sandy loam, in an area of Brunswick-Paka complex, 15 to 30 percent slopes; 1,800 feet east and 550 feet north of the southwest corner of sec. 22, T. 29 N., R. 7 W.

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

Bw—5 to 10 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable; slightly acid; clear smooth boundary.

BC—10 to 16 inches; light gray (10YR 7/2) fine sandy loam, light brownish gray (10YR 6/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; neutral; gradual smooth boundary.

C—16 to 36 inches; light gray (2.5Y 7/2) fine sandy loam, light brownish gray (2.5Y 6/2) moist; weak coarse prismatic structure; soft, very friable; neutral; gradual wavy boundary.

Cr—36 to 60 inches; white (5Y 8/2), weakly cemented sandstone bedrock that crushes to loamy fine sand, light gray (5Y 7/2) moist; neutral.

The thickness of the solum ranges from 12 to 28 inches. The depth to bedrock ranges from 20 to 40 inches.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It is typically fine sandy loam, but the range includes loam and loamy fine sand. The Bw and BC horizons have hue of 10YR or 2.5Y, value of 5 to 8 (4 to 6 moist), and chroma of 2 or

3. They are typically fine sandy loam, but the range includes loamy very fine sand and loam that averages less than 18 percent clay. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 6 to 8 (5 to 7 moist), and chroma of 2 or 3. It ranges from fine sandy loam to fine sand. The Cr horizon has colors similar to those of the C horizon. It is weakly cemented sandstone bedrock that crushes to loamy fine sand or fine sand.

Butler Series

The Butler series consists of very deep, somewhat poorly drained, slowly permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Butler soils are commonly adjacent to Fillmore, Scott, and Trent soils. Fillmore and Scott soils are somewhat poorly drained and poorly drained. They have an E horizon. They are lower on the landscape than the Butler soils. Trent soils are well drained and moderately well drained. They have less clay in the B horizon than the Butler soils.

Typical pedon of Butler silt loam, 0 to 2 percent slopes, 385 feet north and 1,840 feet west of the southeast corner of sec. 25, T. 29 N., R. 3 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—7 to 14 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

Bt1—14 to 26 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; moderate very fine and fine angular blocky structure; very hard, very firm; few fine faint pellets of manganese; slightly acid; gradual wavy boundary.

Bt2—26 to 51 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine prismatic structure parting to moderate medium and fine angular blocky; very hard, very firm; few fine faint pellets of manganese; slightly acid; gradual wavy boundary.

BC—51 to 60 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; common medium distinct yellowish brown (10YR 5/4 moist) mottles; moderate medium prismatic structure parting to weak medium angular blocky; very hard, very firm; neutral.

The thickness of the solum ranges from 50 to more than 60 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and

chroma of 1 or 2. It is silt loam or silty clay loam. A few pedons have an E horizon of gray or light gray silt loam that is 1 to 3 inches thick. The Bt horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is silty clay or clay. The BC horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2.

Coleridge Series

The Coleridge series consists of very deep, somewhat poorly drained, moderately slowly permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Coleridge soils are commonly adjacent to Aowa, Gibbon, Kezan, and Shell soils. Aowa soils are calcareous and well drained. They are stratified in the upper part. Aowa and Shell soils are slightly higher on the landscape than the Coleridge soils. Shell soils are well drained. Gibbon soils have a thinner dark surface layer than the Coleridge soils. They are calcareous at the surface. Kezan soils have a calcareous, stratified surface layer. They are poorly drained.

Typical pedon of Coleridge silt loam, 0 to 2 percent slopes, 1,760 feet east and 230 feet south of the northwest corner of sec. 27, T. 29 N., R. 3 W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; slightly hard, friable; slightly acid; abrupt smooth boundary.

A1—7 to 21 inches; very dark gray (10YR 3/1) silt loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable; slightly acid; gradual wavy boundary.

A2—21 to 27 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark gray (10YR 3/1) moist, very dark grayish brown (10YR 3/2) crushed and moist; moderate medium granular structure; hard, firm; slightly acid; clear wavy boundary.

A3—27 to 36 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; weak fine subangular blocky structure; hard, firm; slightly acid; clear wavy boundary.

Bw—36 to 45 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; common medium prominent reddish yellow (7.5YR 6/6 moist) mottles; weak fine prismatic structure parting to weak medium subangular blocky; hard, firm; neutral; clear wavy boundary.

Cg—45 to 60 inches; light gray (2.5Y 7/2) silty clay loam, light brownish gray (2.5Y 6/2) moist; many medium prominent brownish yellow (10YR 6/6 moist) mottles; massive; hard, firm; many fine soft

masses and streaks of lime; strong effervescence; moderately alkaline.

concretions of lime; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 30 to 60 inches. The mollic epipedon is 30 to 45 inches thick. Calcium carbonates are commonly at a depth of 40 to 60 inches but do not occur in the solum.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is silt loam or silty clay loam. The Cg horizon has hue of 10YR to 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 or 2. It is silty clay loam or silty loam. Some pedons have a layer of fine sandy loam to silty clay below a depth of 4 feet. Distinct and prominent mottles are in the lower part of the A horizon and in the Bw and Cg horizons.

Crofton Series

The Crofton series consists of very deep, well drained, moderately permeable soils on uplands. These soils formed in silty, calcareous loess (fig. 17). Slopes range from 2 to 60 percent.

Crofton soils are commonly adjacent to Alcester, Moody, and Nora soils. Alcester soils have a mollic epipedon. They are on the lower parts of the landscape. Moody and Nora soils have a mollic epipedon and a cambic horizon. They do not have calcium in the upper part of the profile. Moody soils are higher on the landscape than the Crofton soils. Nora soils are generally lower on the landscape than the Crofton soils.

Typical pedon of Crofton silt loam, 15 to 30 percent slopes, 830 feet east and 1,050 feet south of the northwest corner of sec. 8, T. 30 N., R. 5 W.

A—0 to 6 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; few fine concretions of lime; strong effervescence; moderately alkaline; clear smooth boundary.

AC—6 to 11 inches; brown (10YR 5/3) silt loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; slightly hard, friable; common fine and medium concretions of lime; strong effervescence; moderately alkaline; clear smooth boundary.

C1—11 to 26 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, friable; common fine and medium concretions of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C2—26 to 60 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; few fine prominent reddish yellow (7.5YR 6/6 moist) relict mottles; massive; slightly hard, friable; few fine

The depth to lime ranges from 0 to 8 inches. Few to many fine or medium concretions of carbonates are throughout the profile.

The A horizon has value of 4 to 6 (3 or 4 moist) and chroma of 2 or 3. The AC horizon has colors intermediate between those of the A and C horizons. The C horizon has hue of 2.5Y or 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4.

Elsmere Series

The Elsmere series consists of very deep, somewhat poorly drained, rapidly permeable soils on high bottom land and in sandhill valleys. These soils formed in sandy alluvium. Slopes range from 0 to 2 percent.

Elsmere soils are commonly adjacent to Boel and Orwet soils. Boel soils are stratified. They are in the lower areas of bottom land. Orwet soils are poorly drained. They are slightly lower on the landscape than the Elsmere soils.

Typical pedon of Elsmere loamy fine sand, 0 to 2 percent slopes, 1,420 feet north and 160 feet west of the southeast corner of sec. 25, T. 29 N., R. 6 W.

A1—0 to 8 inches; dark gray (10YR 4/1) loamy fine sand, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; slightly acid; clear wavy boundary.

A2—8 to 19 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; neutral; clear wavy boundary.

AC—19 to 25 inches; grayish brown (10YR 5/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; weak medium prismatic structure; soft, very friable; neutral; clear wavy boundary.

C1—25 to 34 inches; light brownish gray (10YR 6/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; many medium prominent brown (7.5YR 4/4 moist) mottles; single grain; loose; neutral; gradual wavy boundary.

C2—34 to 60 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; common medium distinct brown (7.5YR 4/4 moist) mottles; single grain; loose; neutral.

The thickness of the solum ranges from 16 to 36 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon is typically loamy fine sand, but the range includes loamy sand and fine sandy loam. This

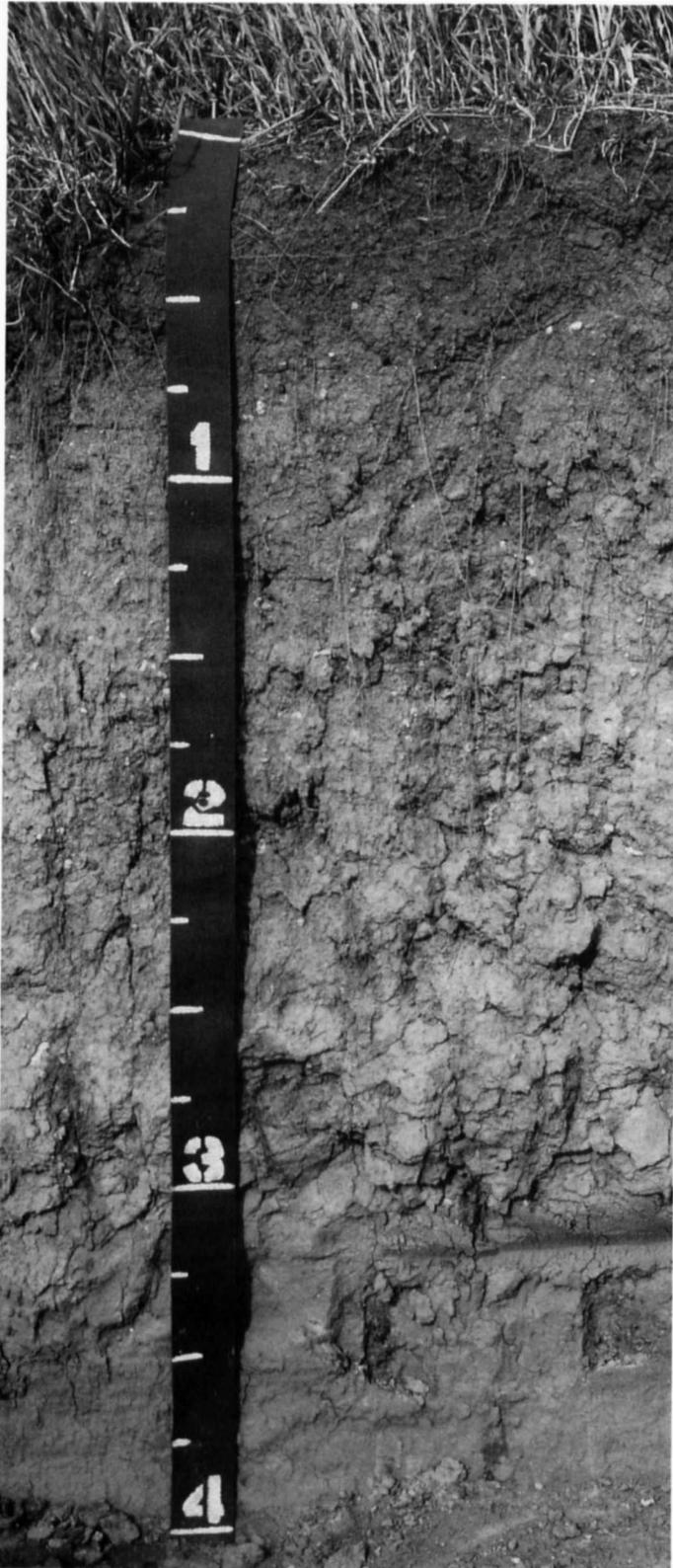


Figure 17.—Profile of a Crofton silt loam.

horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. The AC horizon has value of 5 or 6 (3 or 4 moist) and chroma of 1 or 2. It is typically loamy fine sand, but the range includes loamy sand and fine sand. The C horizon has value of 5 to 7 (4 or 5 moist) and chroma of 2 or 3. It is typically fine sand, but the range includes loamy sand, loamy fine sand, and sand.

Eltree Series

The Eltree series consists of very deep, well drained, moderately permeable soils on uplands or foot slopes. These soils formed in loamy colluvial and alluvial sediments. Slopes range from 0 to 6 percent.

Eltree soils are commonly adjacent to Crofton, Gavins, Labu, Lynch, and Nora soils. Crofton, Gavins, Labu, Lynch, and Nora soils are higher on the landscape than the Eltree soils. Crofton, Gavins, Labu, and Lynch soils do not have a mollic epipedon. Crofton and Gavins soils are generally on the steeper slopes. Gavins soils are shallow to soft, calcareous siltstone bedrock. Labu and Lynch soils have more clay in the control section than the Eltree soils. They are moderately deep over shale bedrock. Nora soils have a mollic epipedon less than 20 inches thick. They generally have carbonates at a lower depth than the Eltree soils.

Typical pedon of Eltree silt loam, 0 to 2 percent slopes, 3,750 feet north and 130 feet west of the southeast corner of sec. 13, T. 33 N., R. 5 W.

- Ap—0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; mildly alkaline; abrupt smooth boundary.
- A1—4 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak very fine granular; slightly hard, friable; mildly alkaline; clear wavy boundary.
- A2—10 to 16 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to weak very fine granular; slightly hard, friable; slight effervescence; moderately alkaline; clear wavy boundary.
- A3—16 to 25 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure parting to weak very fine granular; slightly hard, friable; strong effervescence; few fine streaks of soft lime; moderately alkaline; clear wavy boundary.
- Bwk—25 to 42 inches; light brownish gray (10YR 6/2)

silt loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable; violent effervescence; few fine streaks of soft lime; moderately alkaline; gradual wavy boundary.

C—42 to 60 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; massive; strong effervescence; common fine streaks of soft lime; moderately alkaline.

The thickness of the solum ranges from 35 to 60 inches. The thickness of the mollic epipedon ranges from 20 to 40 inches. Carbonates are at a depth of 0 to 15 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 to 3. It is dominantly silt loam, but the range includes very fine sandy loam and loam. The Bw horizon has value of 5 to 7 (3 to 5 moist) and chroma of 2 to 4. It has textures similar to those of the A horizon. The C horizon has value of 6 or 7 (5 or 6 moist) and chroma of 2 to 4. It is silt loam, loam, or silty clay loam.

Fillmore Series

The Fillmore series consists of very deep, somewhat poorly drained, very slowly permeable soils in upland depressions. These soils formed in loess. Slopes are 0 to 1 percent.

Fillmore soils are commonly adjacent to Moody and Trent soils. Moody and Trent soils contain less clay in the subsoil than the Fillmore soils. Moody soils are well drained. They are higher on the landscape than the Fillmore soils. Trent soils are well drained and moderately well drained. They are slightly higher on the landscape than the Fillmore soils.

Typical pedon of Fillmore silt loam, 0 to 1 percent slopes, 2,040 feet west and 60 feet south of the northeast corner of sec. 10, T. 29 N., R. 3 W.

Ap—0 to 6 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—6 to 10 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

E—10 to 15 inches; light gray (10YR 6/1) silt loam, gray (10YR 5/1) moist; moderate thin platy structure; slightly hard, friable; medium acid; abrupt smooth boundary.

Bt1—15 to 30 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm; few hard pellets of iron

and manganese 1 to 2 millimeters in size; medium acid; gradual smooth boundary.

Bt2—30 to 40 inches; gray (10YR 5/1) silty clay, dark gray (10YR 4/1) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; few hard pellets of iron and manganese 1 to 2 millimeters in size; neutral; gradual smooth boundary.

BC—40 to 50 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure parting to weak medium angular blocky; very hard, very firm; few hard pellets of iron and manganese 1 to 2 millimeters in size; neutral; gradual smooth boundary.

C—50 to 60 inches; light brownish gray (10YR 6/2) silty clay, grayish brown (10YR 5/2) moist; weak medium prismatic structure; very hard, very firm; neutral.

The thickness of the solum ranges from 45 to 70 inches. The depth to carbonates is typically more than 60 inches, but some pedons have carbonates at a depth of 45 to 60 inches. The mollic epipedon extends into the upper part of the Bt horizon.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is mostly silt loam, but in some pedons it is silty clay loam. The E horizon has value of 5 or 6 (4 or 5 moist) and chroma of 1. The Bt horizon has value of 3 to 5 (2 to 4 moist) and chroma of 1 or 2. It is typically silty clay, but the range includes clay. The BC horizon has hue of 10YR or 2.5Y, value of 5 or 6 (3 to 5 moist), and chroma of 2 or 3. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4.

Gavins Series

The Gavins series consists of shallow, well drained, moderately permeable soils on uplands. These soils formed in sediments weathered from soft siltstone bedrock. Slopes range from 11 to 60 percent.

Gavins soils are commonly adjacent to Bristow, Mariaville, Redstoe, and Sansarc soils. Bristow and Sansarc soils formed in Pierre shale. They contain more clay than the Gavins soils. Bristow, Sansarc, and Redstoe soils are higher on the landscape than the Gavins soils. Mariaville soils have a calcium carbonate equivalent of less than 15 percent. Redstoe soils are moderately deep over siltstone bedrock. They have a mollic epipedon.

Typical pedon of Gavins silt loam, in an area of Redstoe-Gavins complex, 11 to 30 percent slopes; 2,375 feet west and 850 feet south of the northeast corner of sec. 20, T. 33 N., R. 2 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt

loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; few small fragments of soft siltstone; violent effervescence; about 30 percent calcium carbonate equivalent; moderately alkaline; clear smooth boundary.

AC—4 to 9 inches; light brownish gray (10YR 6/2) silt loam, grayish brown (10YR 5/2) moist; weak very fine subangular blocky structure; slightly hard, friable; few fragments of soft siltstone; violent effervescence; about 40 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

C—9 to 14 inches; white (10YR 8/2) silt loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable; many fragments of soft siltstone; violent effervescence; about 60 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

Cr—14 to 60 inches; white (10YR 8/2), soft siltstone bedrock, very pale brown (10YR 7/3) moist; massive; hard, firm; seams or bands of gypsum between bedding planes; violent effervescence; about 70 percent calcium carbonate equivalent; moderately alkaline.

Fragments of soft siltstone are throughout the solum. The depth to siltstone bedrock ranges from 10 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. The AC horizon has value of 5 to 7 (4 to 6 moist) and chroma of 2 to 4. It is silty clay loam or silt loam. The C horizon has hue of 10YR or 2.5Y, value of 5 to 8 (5 to 7 moist), and chroma of 1 to 5. It is silt loam or loam. The Cr horizon is siltstone bedrock that is soft when moist but hard when dry. Seams of gypsum, ranging from 0.25 to 0.75 inch in thickness, are on some fracture planes.

Gibbon Series

The Gibbon series consists of very deep, somewhat poorly drained, moderately slowly permeable soils on bottom land. These soils formed in calcareous alluvium. Slopes range from 0 to 2 percent.

Gibbon soils are commonly adjacent to Kezan, Ord, and Shell soils. Kezan and Ord soils are in landscape positions similar to those of the Gibbon soils. Shell soils are in the slightly higher landscape positions. Kezan soils are poorly drained. Ord soils contain less clay in the upper part of the profile than the Gibbon soils. They are sandy in the lower part. Shell soils are well drained. They have a mollic epipedon that is more than 20 inches thick.

The Gibbon soils in this county are taxadjuncts

because they have brighter colors than are typical for the series and because they do not have mottles directly below the mollic epipedon. These differences, however, do not affect the use and management of the soils.

Typical pedon of Gibbon silt loam, 0 to 2 percent slopes, 2,110 feet east and 105 feet north of the southwest corner of sec. 34, T. 29 N., R. 5 W.

Ap—0 to 6 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak very fine granular structure; slightly hard, friable; strong effervescence; moderately alkaline; abrupt smooth boundary.

A—6 to 12 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable; strong effervescence; moderately alkaline; clear smooth boundary.

AC—12 to 18 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable; violent effervescence; moderately alkaline; gradual smooth boundary.

C1—18 to 29 inches; light gray (10YR 7/1) silty clay loam, gray (10YR 5/1) moist; massive; slightly hard, friable; few accumulations of lime; violent effervescence; moderately alkaline; gradual smooth boundary.

C2—29 to 35 inches; light gray (10YR 7/1) silty clay loam, gray (10YR 5/1) moist; common medium prominent strong brown (7.5YR 5/6 moist) mottles; massive; hard, firm; few accumulations of lime; strong effervescence; moderately alkaline; few thin strata of dark material; gradual smooth boundary.

C3—35 to 60 inches; light gray (5Y 7/1) silty clay loam, gray (10YR 5/1) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; massive; hard, firm; few fine concretions of lime; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 12 to 28 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches. The depth to carbonates is less than 10 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is typically silt loam, but the range includes silty clay loam, loam, and very fine sandy loam. The AC horizon has colors intermediate between those of the A and C horizons. The C horizon has hue of 10YR to 5Y, value of 5 to 8 (4 to 6 moist), and chroma of 1 or 2. It is typically silty clay loam or silt loam, but the range includes very fine sandy loam and fine sandy loam.

Hobbs Series

The Hobbs series consists of very deep, well drained, moderately permeable soils on bottom land. These soils formed in stratified alluvium. Slopes range from 0 to 2 percent.

Hobbs soils are commonly adjacent to Alcester, Aowa, Coleridge, and Shell soils. Alcester and Coleridge soils are not stratified. Alcester, Coleridge, and Shell soils have a mollic epipedon more than 20 inches thick. Coleridge soils are somewhat poorly drained. Aowa soils are calcareous in the upper part of the profile. Shell soils are slightly higher on the landscape than the Hobbs soils.

Typical pedon of Hobbs silt loam, 0 to 2 percent slopes, 2,600 feet south and 75 feet west of the northeast corner of sec. 24, T. 33 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; neutral; clear smooth boundary.

C—7 to 35 inches; stratified grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, friable; neutral; clear smooth boundary.

Ab—35 to 60 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; slightly hard, friable; neutral.

The profile is typically noncalcareous throughout. Some pedons have thin, recently deposited layers that contain small amounts of carbonates.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is dominantly silt loam, but the range includes silty clay loam and very fine sandy loam. The C horizon has strata of contrasting colors that have value of 4 to 7 (3 to 6 moist) and chroma of 1 to 3. Some pedons have strata that have higher or lower value. The C horizon typically is silt loam, but the range includes silty clay loam and very fine sandy loam. Buried soils are common below a depth of 25 inches.

Hord Series

The Hord series consists of very deep, well drained, moderately permeable soils on stream terraces. These soils formed in loess and silty alluvium. Slopes range from 0 to 2 percent.

Hord soils are commonly adjacent to Alcester, Aowa, Gibbon, Hobbs, and Shell soils. Alcester soils are on foot slopes. Aowa and Hobbs soils are stratified. They

do not have a B horizon or a mollic epipedon. Aowa soils are calcareous. They are lower on the landscape than the Hord soils. Gibbon and Shell soils are slightly lower on the landscape than the Hord soils. Gibbon soils have a mollic epipedon less than 20 inches thick. They are somewhat poorly drained. Shell soils are stratified below a depth of 24 inches. They do not have a B horizon.

Typical pedon of Hord silt loam, 0 to 2 percent slopes, 900 feet north and 105 feet east of the southwest corner of sec. 19, T. 30 N., R. 4 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; many very fine roots; neutral; abrupt smooth boundary.

A—7 to 17 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak medium and fine granular structure; slightly hard, friable; common very fine roots; neutral; clear smooth boundary.

Bw—17 to 27 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable; few very fine roots; neutral; clear smooth boundary.

BC—27 to 46 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few very fine roots; neutral; clear smooth boundary.

C—46 to 60 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; slightly hard, friable; few fine streaks of carbonates; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 60 inches. The thickness of the mollic epipedon ranges from 20 to 40 inches. The mollic epipedon extends into the Bw horizon. The depth to carbonates ranges from 24 to 48 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. The Bw horizon has colors similar to those of the A horizon. It is silt loam or silty clay loam. The BC horizon has value of 4 to 6 (3 to 5 moist) and chroma of 2 or 3. It is loam, silt loam, or silty clay loam. The C horizon has value of 4 to 7 (3 to 5 moist) and chroma of 2 or 3. It is typically silt loam, but the range includes silty clay loam and very fine sandy loam.

Inavale Series

The Inavale series consists of very deep, excessively drained, rapidly permeable soils on bottom land. These

soils formed in sandy alluvium. Slopes range from 0 to 2 percent.

Inavale soils are commonly adjacent to Barney, Boel, Ord, and Orwet soils. Barney and Orwet soils are lower on the landscape than the Inavale soils. They are very poorly drained and poorly drained. Boel and Ord soils have a mollic epipedon. They are somewhat poorly drained. They are slightly lower on the landscape than the Inavale soils. Ord soils have more silt and clay in the upper part of the control section than the Inavale soils.

Typical pedon of Inavale fine sand, 0 to 2 percent slopes, 2,250 feet east and 800 feet south of the northwest corner of sec. 20, T. 31 N., R. 6 W.

- A—0 to 5 inches; grayish brown (10YR 5/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose; neutral; clear smooth boundary.
- AC—5 to 14 inches; light brownish gray (10YR 6/2) fine sand, grayish brown (10YR 5/2) moist; single grain; loose; neutral; clear smooth boundary.
- C1—14 to 30 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; thin strata of lighter and darker colored fine sandy loam; single grain; loose; neutral; clear smooth boundary.
- C2—30 to 60 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; thin strata of lighter and darker colored fine sandy loam; single grain; loose; mildly alkaline.

These soils do not typically have carbonates, but pedons on bottom land along the Missouri River have carbonates in some parts of the profile.

The A horizon has value of 4 to 7 (3 to 5 moist) and chroma of 2 or 3. The texture ranges from sand to fine sandy loam. The AC and C horizons have value of 5 to 8 (4 to 6 moist) and chroma of 2 or 3. They are typically fine sand, but the range includes loamy fine sand, loamy sand, and sand. The C horizon commonly has strata of finer textured material.

The Inavale soils in map units lh and lm are darker than is typical for the series. This difference, however, does not affect the use and management of the soils.

Kezan Series

The Kezan series consists of very deep, poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvial sediments. Slopes range from 0 to 2 percent.

Kezan soils are commonly adjacent to Alcester, Aowa, Coleridge, and Shell soils. Alcester, Aowa, and Shell soils are well drained. Alcester soils have a thick, dark, noncalcareous A horizon. They are on foot slopes. Aowa and Shell soils are higher on the landscape than

the Kezan soils. Shell soils have a mollic epipedon that is more than 20 inches thick. Coleridge soils have a mollic epipedon that is more than 30 inches thick. They are somewhat poorly drained.

The Kezan soils in this county are taxadjuncts because they are calcareous at the surface and are stratified in the surface layer and because they do not have the mollic colors that are typical for the series. These differences, however, do not affect the use and management of the soils.

Typical pedon of Kezan silt loam, 0 to 2 percent slopes, 200 feet east and 2,600 feet north of the southwest corner of sec. 8, T. 30 N., R. 2 W.

- A—0 to 10 inches; stratified grayish brown (10YR 5/2) and brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; few fine prominent reddish brown (5YR 4/4 moist) mottles; weak thin platy structure; slightly hard, friable; many fine roots; common fine streaks of soft lime; strong effervescence; moderately alkaline; clear smooth boundary.
- C—10 to 22 inches; stratified grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; common medium prominent reddish brown (5YR 4/4 moist) mottles; weak thin platy structure; slightly hard, friable; common fine roots; strong effervescence; moderately alkaline; clear smooth boundary.
- Ab1—22 to 32 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist, very dark gray (10YR 3/1) crushed and moist; moderate fine and very fine granular structure; slightly hard, friable; few fine roots; neutral; diffuse smooth boundary.
- Ab2—32 to 48 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist, very dark gray (10YR 3/1) crushed and moist; few fine prominent reddish yellow (7.5YR 6/6 moist) mottles; moderate fine granular structure; hard, firm; few fine roots; neutral; diffuse smooth boundary.
- C'—48 to 60 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; few fine prominent reddish brown (5YR 4/3 moist) mottles; massive; hard, firm; neutral.

Free carbonates are typically at the surface, but they may also occur within a depth of 10 inches.

The A horizon has hue of 10YR, value of 4 to 7 (2 to 4 moist), and chroma of 2 or 3. It is mildly alkaline or moderately alkaline. It is dominantly silt loam, but the range includes silty clay loam and very fine sandy loam. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It typically has thin lenses of lighter and darker material. It is silt loam or

silty clay loam. The Ab horizon is below a depth of 20 inches. It has value of 3 or 4 (2 or 3 moist) and chroma of 1. It is silt loam or silty clay loam.

Labu Series

The Labu series consists of moderately deep, well drained, slowly permeable soils on uplands. These soils formed in material weathered from dark shale bedrock (fig. 18). Slopes range from 6 to 30 percent.

Labu soils are commonly adjacent to Bristow, Lynch, Sansarc, Verdell, and Verdigre soils. Bristow and Lynch soils formed in gypsiferous, light colored shale bedrock. They are slightly lower on the landscape than the Labu soils. Bristow soils are shallow over shale bedrock. Sansarc soils are shallow over dark shale bedrock. They are slightly higher on the landscape than the Labu soils. Verdell soils are very deep. They are lower on the landscape than the Labu soils. They have a thick mollic epipedon. Verdigre soils are deep. They have a mollic epipedon. They have less clay in the control section than the Labu soils.

Typical pedon of Labu silty clay, in an area of Labu-Sansarc complex, 11 to 30 percent slopes; 630 feet south and 90 feet east of the northwest corner of sec. 9, T. 32 N., R. 5 W.

A—0 to 4 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate fine subangular blocky structure parting to weak fine granular; hard, firm; many very fine roots; strong effervescence; moderately alkaline; clear smooth boundary.

Bw1—4 to 8 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; very hard, very firm; common very fine roots; strong effervescence; moderately alkaline; clear wavy boundary.

Bw2—8 to 16 inches; light olive gray (5Y 6/2) clay, olive gray (5Y 4/2) moist; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm; few very fine roots; common pressure faces; dark organic stains on faces of peds; violent effervescence; moderately alkaline; gradual wavy boundary.

BC—16 to 25 inches; light olive gray (5Y 6/2) clay, olive gray (5Y 5/2) moist; weak coarse prismatic structure parting to weak coarse angular blocky; very hard, very firm; few very fine roots; common pressure faces; few medium soft accumulations of lime; violent effervescence; moderately alkaline; clear wavy boundary.

C—25 to 34 inches; light olive gray (5Y 6/2) clay, olive

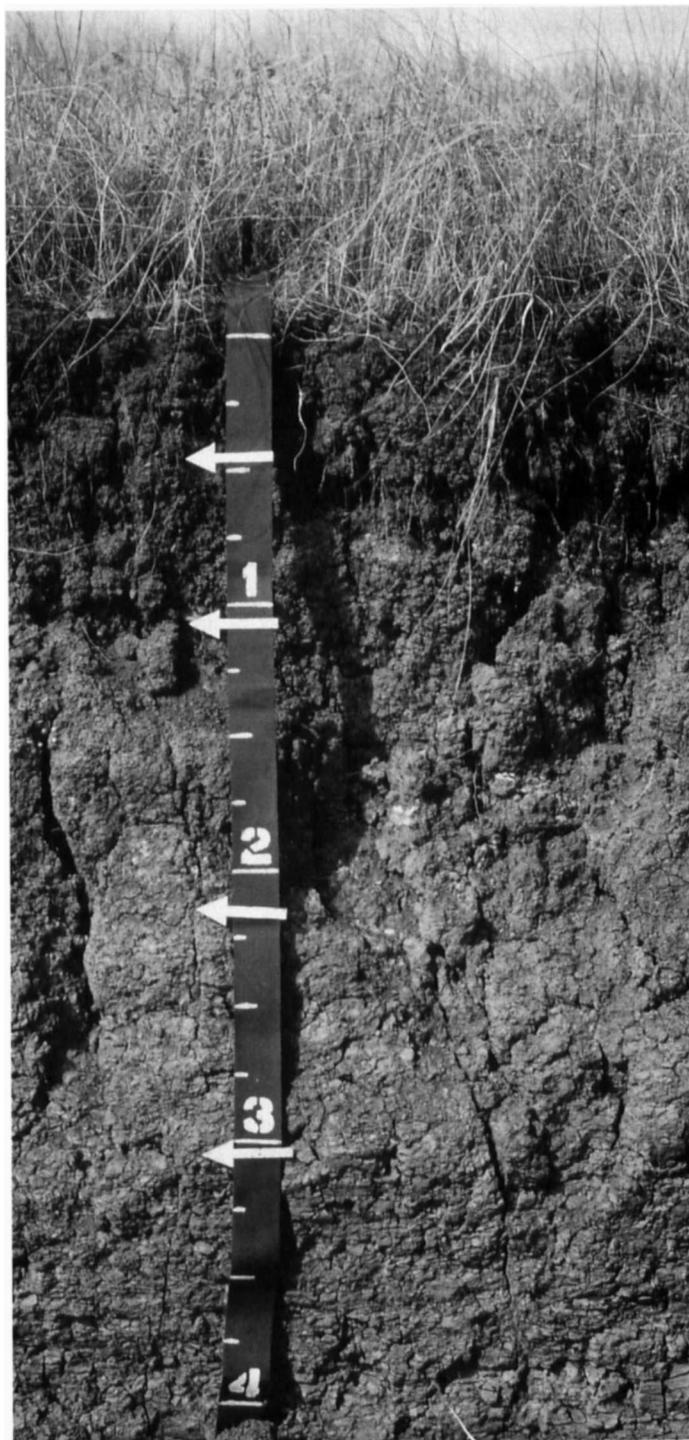


Figure 18.—Profile of a Labu silty clay. The bottom arrow marks the upper boundary of the bedded shale. Depth is marked in feet.

gray (5Y 5/2) moist; weak coarse prismatic structure parting to weak thin platy; very hard, very firm;

about 20 percent, by volume, shale channers; few very fine roots; common pressure faces; few accumulations of lime and gypsum; violent effervescence; moderately alkaline; clear wavy boundary.

Cr—34 to 60 inches; light gray (5Y 7/2) shale bedrock, olive gray (5Y 5/2) moist; platy shale fragments; very hard, very firm; few accumulations of lime and gypsum; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 16 to 28 inches. The depth to shale bedrock ranges from 20 to 40 inches. When the soils are dry, cracks commonly extend from the surface to the solum.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 2 or 3. It is dominantly silty clay, but the range includes clay. The B horizon has hue of 10YR to 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 to 4. It is silty clay or clay. The C horizon has hue of 10YR to 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. Some pedons have small accumulations of gypsum. The Cr horizon has hue of 10YR to 5Y, value of 6 or 7 (4 to 6 moist), and chroma of 2 to 4.

Longford Series

The Longford series consists of very deep, well drained, slowly permeable soils on uplands. These soils formed in loess or alluvial sediments. Slopes range from 2 to 11 percent.

Longford soils are commonly adjacent to Betts, Brunswick, Loretto, Moody, and Paka soils. Betts and Brunswick soils are lower on the landscape than the Longford soils. Betts soils have a few stones. They contain less clay than the Longford soils. They formed in glacial till. Brunswick soils are moderately deep. They contain more sand and less clay than the Longford soils. Loretto, Moody, and Paka soils have less clay in the control section than the Longford soils. They do not have pinkish colors.

The Longford soils in this county are taxadjuncts because they do not have a mollic epipedon. This difference, however, does not affect the use and management of the soils.

Typical pedon of Longford silty clay loam, 2 to 6 percent slopes, eroded, 970 feet south and 355 feet west of the northeast corner of sec. 12, T. 29 N., R. 4 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; hard, firm; neutral; abrupt smooth boundary.

Bt1—6 to 14 inches; brown (7.5YR 5/2) silty clay, dark

brown (7.5YR 4/4) moist; moderate fine angular blocky structure; very hard, very firm; neutral; clear wavy boundary.

Bt2—14 to 28 inches; pinkish gray (7.5YR 6/2) silty clay, dark brown (7.5YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm; neutral; gradual wavy boundary.

BC—28 to 38 inches; pink (7.5YR 7/4) silty clay loam, brown (7.5YR 5/4) moist; weak medium prismatic structure parting to weak coarse angular blocky; very hard, very firm; mildly alkaline; gradual wavy boundary.

C—38 to 60 inches; pink (7.5YR 7/4) silty clay loam, brown (7.5YR 5/4) moist; massive; very hard, very firm; mildly alkaline.

The thickness of the solum ranges from 38 to 45 inches. The depth to free carbonates ranges from 36 to more than 60 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. It is typically silty clay loam, but the range includes loam and silt loam. The Bt horizon has value of 4 to 6 (3 to 5 moist) and chroma of 2 to 4. It is typically silty clay, but the range includes clay loam and silty clay loam. The content of clay averages about 43 percent but ranges from 35 to 45 percent. The C horizon has hue of 7.5YR or 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 3 or 4. It is typically silty clay loam, but the range includes clay loam and loam.

Loretto Series

The Loretto series consists of very deep, well drained, moderately permeable soils on uplands. These soils formed in loamy eolian materials. Slopes range from 0 to 6 percent.

Loretto soils are commonly adjacent to Bazile, Moody, Nora, Paka, and Trent soils. Bazile and Paka soils are lower on the landscape than the Loretto soils. Bazile soils have sandy material at a depth of 20 to 40 inches. Paka soils formed in material weathered from siltstone bedrock. Moody, Nora, and Trent soils contain less sand in the control section than the Loretto soils. Trent soils have a mollic epipedon more than 20 inches thick. They are in swales or in the lower landscape positions.

Typical pedon of Loretto fine sandy loam, 2 to 6 percent slopes, 750 feet west and 120 feet north of the southeast corner of sec. 11, T. 29 N., R. 5 W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—5 to 10 inches; grayish brown (10YR 5/2) fine sandy

loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable; slightly acid; clear wavy boundary.

Bt1—10 to 16 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; slightly acid; clear wavy boundary.

Bt2—16 to 30 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable; neutral; gradual wavy boundary.

BC—30 to 38 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium prismatic structure; slightly hard, friable; neutral; clear wavy boundary.

C—38 to 60 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; few fine prominent yellowish brown (10YR 5/8 moist) relict mottles; massive; slightly hard, friable; common fine concretions of lime; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 36 to 54 inches. The depth to carbonates ranges from 25 to 54 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is typically fine sandy loam, but the range includes loam. The Bt horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is typically loam, but the range includes silt loam and silty clay loam. It is 20 to 35 percent clay. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is typically silt loam, but the range includes loam and silty clay loam.

Lynch Series

The Lynch series consists of moderately deep, well drained, slowly permeable soils on uplands. These soils formed in material weathered from calcareous and gypsiferous shale bedrock. Slopes range from 6 to 30 percent.

Lynch soils are commonly adjacent to Bristow, Labu, Sansarc, and Verdel soils. Bristow and Sansarc soils are shallow over shale bedrock. Sansarc and Labu soils contain less calcium carbonate and gypsum than the Lynch soils. They formed in dark shale bedrock. Bristow, Labu, and Sansarc soils are slightly higher on the landscape than the Lynch soils. Verdel soils are very deep. They have a thick mollic epipedon. They are on the lower slopes and stream terraces.

Typical pedon of Lynch silty clay, in an area of Lynch-Verdel complex, 6 to 11 percent slopes; 480 feet

north and 210 feet west of the southeast corner of sec. 8, T. 33 N., R. 8 W.

Ap—0 to 5 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine subangular blocky structure parting to moderate fine granular; hard, firm; common very fine roots; violent effervescence; moderately alkaline; abrupt smooth boundary.

Bw—5 to 12 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm; few very fine roots; violent effervescence; moderately alkaline; gradual wavy boundary.

BC—12 to 20 inches; mixed light gray (2.5Y 7/2) and light yellowish brown (2.5Y 6/4) silty clay, dark grayish brown (2.5Y 4/2) and olive brown (2.5Y 4/4) moist; weak medium prismatic structure; hard, firm; few very fine roots; common seams and pockets of lime and gypsum; violent effervescence; moderately alkaline; gradual wavy boundary.

C—20 to 35 inches; mixed light olive gray (5Y 6/2) and olive yellow (2.5Y 6/6) clay, mixed olive gray (5Y 4/2) and light olive brown (2.5Y 5/6) moist; massive parting to moderate thick platy structure; very hard, very firm; about 12 percent channers of shale, by volume; few very fine roots between plates; common seams and pockets of lime and gypsum; slight effervescence; moderately alkaline; gradual wavy boundary.

Cr—35 to 60 inches; mixed pale yellow (2.5Y 7/4) and light gray (5Y 7/1) shale bedrock, light olive brown (2.5Y 5/4) and gray (5Y 6/1) moist; massive parting to moderate thick platy structure; very hard, very firm; common seams and pockets of lime and gypsum; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 17 to 35 inches. The depth to shale bedrock ranges from 20 to 40 inches. Calcium carbonate and gypsum are in seams and pockets.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 (2 to 4 moist), and chroma of 2 or 3. The B horizon has value of 5 to 7 (4 to 6 moist) and chroma of 2 to 4. It is silty clay or clay. The C and Cr horizons have hue of 2.5Y or 5Y and value of 6 to 8 (4 to 6 moist). The C horizon has chroma of 2 to 6, and the Cr horizon has chroma of 1 to 4.

Mariaville Series

The Mariaville series consists of shallow, well drained, moderately permeable soils on uplands. These soils formed in sediments weathered from weakly

cemented siltstone bedrock. Slopes range from 3 to 30 percent.

Mariaville soils are commonly adjacent to Brunswick, Crofton, Meadin, Paka, and Thurman soils. Brunswick and Paka soils are in landscape positions similar to those of the Mariaville soils. Brunswick soils contain less clay than the Mariaville soils. They have weakly cemented sandstone bedrock at a depth of 20 to 40 inches. Crofton, Meadin, and Thurman soils are higher on the landscape than the Mariaville soils. Crofton soils formed in deep, calcareous, silty loess. Meadin soils have gravelly coarse sand at a depth of 8 to 20 inches. Thurman soils are deep. They are sandy in the control section. Paka soils have a mollic epipedon. They are deep over soft siltstone bedrock.

Typical pedon of Mariaville very fine sandy loam, 3 to 30 percent slopes, 2,540 feet west and 850 feet south of the northeast corner of sec. 26, T. 29 N., R. 7 W.

- A—0 to 3 inches; grayish brown (10YR 5/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; about 5 percent gravel, by volume; about 8 percent calcium carbonate; few fine concretions and soft accumulations of lime; violent effervescence; moderately alkaline; clear smooth boundary.
- ACk—3 to 6 inches; mixed light brownish gray (2.5Y 6/2) and light gray (2.5Y 7/2) very fine sandy loam, grayish brown (2.5Y 5/2) and light brownish gray (2.5Y 6/2) moist; weak fine subangular blocky structure parting to weak very fine subangular blocky; slightly hard, friable; about 8 percent gravel, by volume; about 12 percent calcium carbonate; few fine concretions of lime and soft accumulations of lime; violent effervescence; moderately alkaline; clear wavy boundary.
- C—6 to 12 inches; light gray (2.5Y 7/2) very fine sandy loam, light brownish gray (2.5Y 6/2) moist; weak fine prismatic structure; slightly hard, friable; about 12 percent gravel, by volume; about 8 percent calcium carbonate; common fine soft accumulations of lime; violent effervescence; moderately alkaline; gradual wavy boundary.
- Cr—12 to 60 inches; white (2.5Y 8/2), weakly cemented siltstone bedrock, light gray (2.5Y 7/2) moist; massive; hard, firm; few fine roots in cracks and on cleavage planes at a depth of 12 to 17 inches; common fine soft accumulations of lime; violent effervescence; moderately alkaline.

The depth to siltstone bedrock ranges from 10 to 20 inches. The average content of clay in the control section ranges from 12 to 30 percent.

The A horizon has value of 3 to 5 (2 or 3 moist). It is

very fine sandy loam, loam, or silt loam. The AC horizon has hue of 10YR or 2.5Y, value of 4 to 7 (3 to 6 moist), and chroma of 2 to 4. It is very fine sandy loam, loam, or silt loam. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 to 4. It is very fine sandy loam, silty clay loam, or silt loam. The Cr horizon has hue of 10YR or 2.5Y, value of 6 to 8 (5 to 7 moist), and chroma of 2 to 4. This horizon can be easily penetrated by a spade or auger but becomes hard when dry.

Meadin Series

The Meadin series consists of excessively drained soils on uplands and stream terraces. These soils formed in 8 to 20 inches of sandy and loamy material over gravelly coarse sand (fig. 19). Permeability is rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 30 percent.

Meadin soils are commonly adjacent to Brunswick, O'Neill, Paka, and Simeon soils. Brunswick, O'Neill, Paka, and Simeon soils have soft sandstone bedrock at a depth of 20 to 40 inches. O'Neill soils formed in 20 to 40 inches of loamy material over gravelly coarse sand. Paka soils are deep. They are lower on the landscape than the Meadin soils. Also, they have more clay in the control section. Simeon soils are very deep and sandy. They do not have a mollic epipedon.

Typical pedon of Meadin sandy loam, in an area of Meadin-O'Neill complex, 3 to 30 percent slopes; 2,100 feet south and 400 feet east of the northwest corner of sec. 8, T. 30 N., R. 6 W.

- A—0 to 7 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; 5 percent gravel, by volume; slightly acid; clear smooth boundary.
- AC—7 to 12 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable; 15 percent gravel, by volume; slightly acid; clear smooth boundary.
- 2C1—12 to 50 inches; light yellowish brown (10YR 6/4) gravelly coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose; 30 percent gravel, by volume; slightly acid; gradual wavy boundary.
- 2C2—50 to 60 inches; very pale brown (10YR 7/4) gravelly coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose; 30 percent gravel, by volume; neutral.

The thickness of the mollic epipedon ranges from 7 to 20 inches. The depth to gravelly coarse sand ranges from 8 to 20 inches.

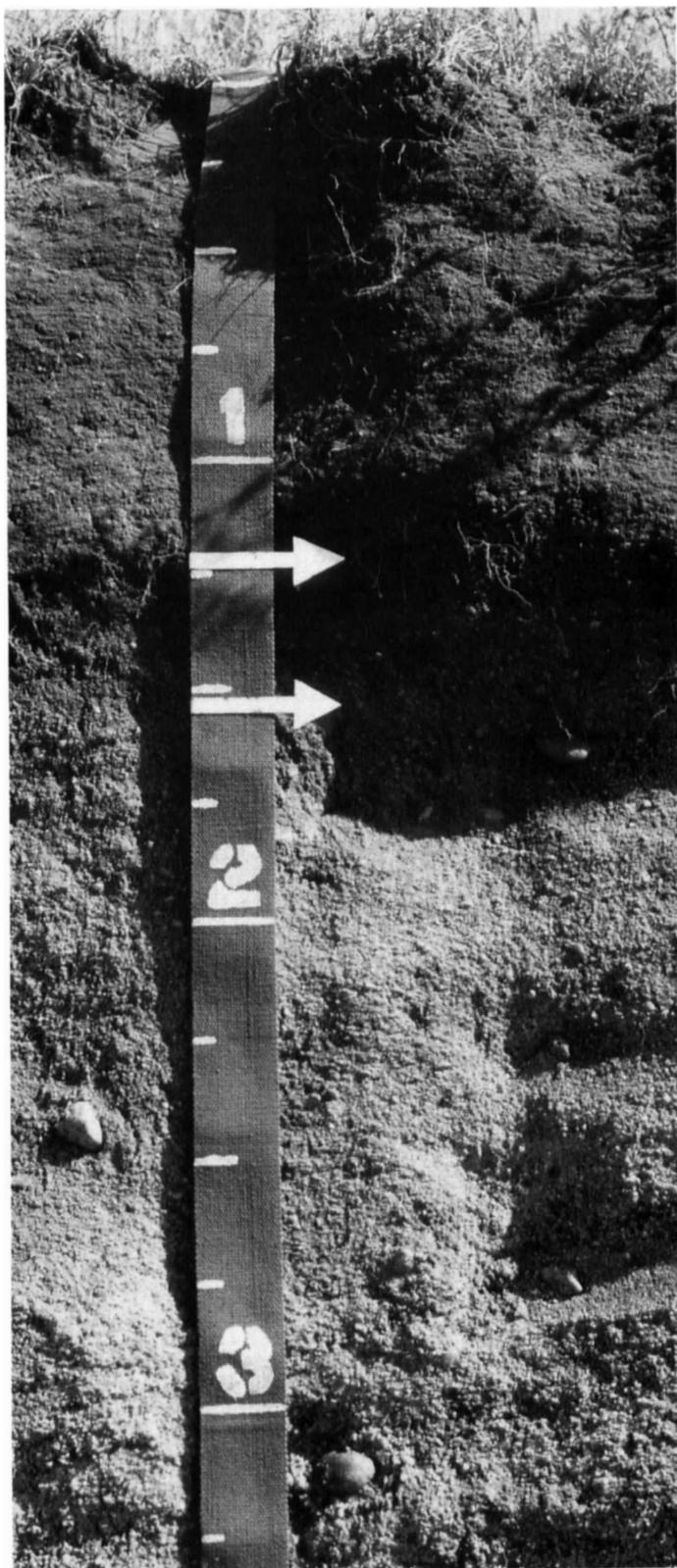


Figure 19.—Profile of a Meadin sandy loam. The upper arrow marks the lower boundary of the surface layer, and the lower arrow marks the upper boundary of the underlying material.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. It is loam, sandy loam, gravelly sandy loam, or loamy sand. The AC horizon has value of 4 to 6 (3 or 4 moist) and chroma of 2 to 4. It is sandy loam, gravelly sandy loam, loamy sand, or very gravelly loamy sand. The 2C horizon has value of 5 to 7 (4 to 6 moist) and chroma of 2 to 4. The content of gravel ranges from 20 to 35 percent, by volume. The 2C horizon is typically gravelly coarse sand, but the range includes gravelly sand and very gravelly coarse sand. In some pedons this horizon has strata of finer textured material.

Moody Series

The Moody series consists of very deep, well drained, moderately slowly permeable soils on uplands. These soils formed in loess. Slopes range from 0 to 6 percent.

Moody soils are commonly adjacent to Crofton, Nora, and Trent soils. Crofton soils do not have a mollic epipedon. They have free carbonates at or near the surface. They are on narrow, convex ridgetops or the steeper side slopes below the Moody soils. Nora soils are calcareous closer to the surface than the Moody soils. Trent soils have a mollic epipedon more than 20 inches thick. They are lower on the landscape than the Moody soils.

Typical pedon of Moody silty clay loam, 2 to 6 percent slopes, 2,460 feet west and 130 feet south of the northeast corner of sec. 28, T. 29 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; hard, firm; common fine roots; medium acid; abrupt smooth boundary.

Bw1—7 to 14 inches; grayish brown (10YR 5/2) silty clay loam, dark brown (10YR 3/3) moist; moderate very fine subangular blocky structure; hard, firm; common fine roots; slightly acid; clear wavy boundary.

Bw2—14 to 27 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; weak fine prismatic structure parting to moderate medium subangular blocky; hard, firm; few fine roots; neutral; clear wavy boundary.

Bw3—27 to 39 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; hard, firm; few fine roots; neutral; clear wavy boundary.

Bk—39 to 48 inches; very pale brown (10YR 7/3) silty clay loam, pale brown (10YR 6/3) moist; weak medium prismatic structure parting to weak coarse

subangular blocky; hard, firm; few fine roots; common fine accumulations of carbonates; violent effervescence; moderately alkaline; gradual wavy boundary.

C—48 to 60 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable; few fine roots; few fine accumulations of carbonates; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to free carbonates range from 30 to 60 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches. The mollic epipedon extends into the B horizon.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 2. It is typically silty clay loam or loam, but the range includes silt loam. The upper part of the Bw horizon has value of 3 to 5 (2 or 3 moist) and chroma of 2 or 3, and the lower part has value of 5 or 6 (4 or 5 moist) and chroma of 2 to 4. The upper part of the Bw horizon is silty clay loam, and the lower part is silty clay loam or silt loam. The Bk horizon has hue of 10YR or 2.5Y, value of 5 to 7 (5 or 6 moist), and chroma of 2 to 4. It is silt loam or silty clay loam. It has common or many accumulations of carbonates. The C horizon has hue of 10YR or 2.5Y, value of 6 or 7 (5 or 6 moist), and chroma of 2 to 4. It has few or common relict mottles in some pedons. It typically is silt loam, but the range includes silty clay loam. In some places the C horizon is loam or very fine sandy loam below a depth of 40 inches. Typically, this horizon has a few accumulations of carbonates in the upper part.

Nora Series

The Nora series consists of very deep, well drained, moderately permeable soils on uplands. These soils formed in loess. Slopes range from 2 to 15 percent.

Nora soils are commonly adjacent to Alcester, Crofton, and Moody soils. Alcester soils have a mollic epipedon more than 24 inches thick. They are on foot slopes below the Nora soils. Crofton soils do not have a mollic epipedon. They have carbonates at or near the surface. They are on convex, steep side slopes above the Nora soils. Moody soils contain lime at a lower depth than the Nora soils.

Typical pedon of Nora silty clay loam, 2 to 6 percent slopes, 125 feet north and 1,700 feet east of the southwest corner of sec. 20, T. 29 N., R. 4 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; slightly acid; abrupt smooth boundary.

A—6 to 11 inches; dark grayish brown (10YR 4/2) silty

clay loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; slightly acid; clear wavy boundary.

Bw—11 to 22 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable; neutral; clear wavy boundary.

Bk—22 to 38 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common fine and medium concretions of lime; violent effervescence; moderately alkaline; gradual wavy boundary.

C—38 to 60 inches; very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; few fine prominent strong brown (7.5YR 5/6 moist) relict mottles; massive; slightly hard, friable; few fine concretions of lime; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 24 to 42 inches. The depth to lime ranges from 13 to 30 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches.

The A horizon has value of 3 or 4 (2 or 3 moist). The Bw horizon has value of 5 or 6 (3 or 4 moist) and chroma of 3 or 4. The A and Bw horizons are silty clay loam or silt loam. The Bk horizon has value of 6 or 7 (4 or 5 moist) and chroma of 3 or 4. It is silt loam or silty clay loam. The C horizon has value of 6 or 7 (5 or 6 moist) and chroma of 2 to 4. It is typically silt loam, but the range includes silty clay loam and very fine sandy loam.

Obert Series

The Obert series consists of very deep, very poorly drained, moderately slowly permeable soils on bottom land. These soils formed in calcareous alluvium. Slopes range from 0 to 2 percent.

Obert soils are commonly adjacent to Fluvaquents and to Gibbon, Kezan, and Orwet soils. Fluvaquents have a seasonal high water table that is higher than that in the Obert soils. They are covered by water for most of the year. Gibbon, Kezan, and Orwet soils are higher on the landscape than the Obert soils. Gibbon soils are somewhat poorly drained. They have a mollic epipedon that is less than 20 inches thick. Kezan and Orwet soils are poorly drained. Kezan soils do not have a mollic epipedon. Orwet soils have sand in the lower part of the control section.

Typical pedon of Obert silt loam, wet, 0 to 2 percent slopes, 1,500 feet south and 300 feet east of the northwest corner of sec. 20, T. 29 N., R. 5 W.

A1—0 to 10 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable; violent effervescence; moderately alkaline; gradual smooth boundary.

A2—10 to 25 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; few fine distinct light yellowish brown (10YR 6/4 moist) mottles; weak fine granular structure; hard, firm; violent effervescence; moderately alkaline; gradual smooth boundary.

AC—25 to 40 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; few fine distinct brown (10YR 4/3 moist) mottles; weak medium and coarse subangular blocky structure; hard, firm; mildly alkaline; clear smooth boundary.

Cg—40 to 60 inches; stratified dark gray (10YR 4/1) and light brownish gray (10YR 6/2) loam, very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; mildly alkaline.

The thickness of the solum ranges from 24 to 48 inches. The mollic epipedon is more than 24 inches thick. Carbonates are typically at the surface but may occur within a depth of 10 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is silt loam or silty clay loam. The AC horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is silty clay loam or silt loam. Some pedons do not have an AC horizon. The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7 (3 to 6 moist), and chroma of 1 or 2. It is silty clay loam, silt loam, or loam. Some pedons have thin strata of sand or silty clay below a depth of 40 inches.

Onawa Series

The Onawa series consists of very deep, somewhat poorly drained soils on bottom land. These soils formed in clayey alluvium over loamy alluvium. Permeability is slow in the upper part and moderate in the lower part. Slopes range from 0 to 2 percent.

Onawa soils are commonly adjacent to Albaton, Blyburg, Inavale, and Solomon soils. Albaton and Solomon soils contain more clay in the lower part than the Onawa soils. Albaton soils are poorly drained and very poorly drained. They are lower on the landscape than the Onawa soils. Solomon soils are poorly drained. Blyburg soils are well drained. They contain less clay than the Onawa soils. Inavale soils are sandy. They are excessively drained. Blyburg and Inavale soils are higher on the landscape than the Onawa soils.

Typical pedon of Onawa silty clay, 0 to 2 percent slopes, 180 feet south and 10 feet east of the northwest corner of sec. 20, T. 33 N., R. 7 W.

Ap—0 to 6 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; weak fine granular structure; very hard, very firm; mildly alkaline; abrupt smooth boundary.

A—6 to 10 inches; stratified dark gray (10YR 4/1) and gray (10YR 5/1) silty clay, black (10YR 2/1) and very dark gray (10YR 3/1) moist; moderate fine and very fine angular blocky structure; very hard, very firm; slight effervescence; mildly alkaline; clear smooth boundary.

Cg1—10 to 25 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; common fine prominent strong brown (7.5YR 5/6 moist) mottles; dominantly massive but has weak thin platy structure in places because of stratification; very hard, very firm; slight effervescence; moderately alkaline; clear smooth boundary.

2Cg2—25 to 35 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; dominantly massive but has some weak thin platy structure in places because of stratification; slightly hard, friable; strong effervescence; moderately alkaline; gradual wavy boundary.

2Cg3—35 to 60 inches; light gray (2.5Y 7/2) very fine sandy loam, grayish brown (2.5Y 5/2) moist; few fine prominent strong brown (7.5YR 5/6 moist) mottles; dominantly massive but has weak thin platy structure in places because of stratification; slightly hard, friable; strong effervescence; moderately alkaline.

Carbonates are at or near the surface. The control section is clay or silty clay to a depth of 18 to 30 inches.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5 (2 or 3 moist), and chroma of 1 or 2. The C horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 (4 or 5 moist) and chroma of 0 to 2. The 2C horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 7 (4 or 5 moist) and chroma of 0 to 2. It is silt loam, loam, or very fine sandy loam.

O'Neill Series

The O'Neill series consists of well drained soils on uplands and stream terraces. These soils formed in 20 to 40 inches of loamy material over gravelly coarse sand. Permeability is moderately rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 30 percent.

O'Neill soils are commonly adjacent to Bazile, Brunswick, Meadin, Ortello, Paka, and Thurman soils. Bazile, Meadin, Ortello, and Thurman soils are in

landscape positions similar to those of the O'Neill soils. Bazile soils have more clay in the subsoil than the O'Neill soils. They do not have gravelly sand or gravelly coarse sand in the lower part of the control section. Meadin soils have gravelly coarse sand at a depth of 8 to 20 inches. Ortello soils do not have gravelly sand or gravelly coarse sand in the control section. Thurman soils are sandy in the control section. They do not have gravelly coarse sand in the lower part of the profile. Brunswick and Paka soils are lower on the landscape than the O'Neill soils. Brunswick soils have sandstone bedrock at a depth of 20 to 40 inches. They do not have a mollic epipedon. Paka soils have more clay in the control section than the O'Neill soils. They have loamy underlying material.

Typical pedon of O'Neill sandy loam, 0 to 2 percent slopes, 2,000 feet south and 1,450 feet west of the northeast corner of sec. 18, T. 30 N., R. 8 W.

- Ap—0 to 6 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; few pebbles; strongly acid; abrupt smooth boundary.
- A—6 to 9 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure parting to moderate very fine granular; slightly hard, friable; few pebbles; strongly acid; clear smooth boundary.
- Bw1—9 to 19 inches; brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; slightly hard, friable; few pebbles; slightly acid; gradual wavy boundary.
- Bw2—19 to 23 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, friable; few pebbles; slightly acid; clear smooth boundary.
- 2C—23 to 60 inches; very pale brown (10YR 7/3) gravelly coarse sand, pale brown (10YR 6/3) moist; single grain; loose; 17 percent gravel, by volume; slightly acid.

The thickness of the mollic epipedon ranges from 7 to 20 inches. The mollic epipedon extends into the B horizon in some pedons. The thickness of the solum ranges from 20 to 40 inches.

The A horizon has hue of 10YR, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is loam, fine sandy loam, sandy loam, or loamy sand. The Bw horizon has hue of 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4. It is fine sandy loam or sandy loam. The 2C horizon has value of 6 or 7 (5 or 6 moist) and chroma of 3 or 4. It is typically gravelly coarse sand, but the range includes sand and gravelly sand.

Ord Series

The Ord series consists of very deep, somewhat poorly drained soils on bottom land. These soils formed in alluvium. Permeability is moderately rapid in the upper part and rapid in the lower part. Slopes range from 0 to 2 percent.

Ord soils are commonly adjacent to Boel, Gibbon, Inavale, and Orwet soils. Boel and Gibbon soils are in landscape positions similar to those of the Ord soils. Boel soils are sandy in the upper part of the control section. Gibbon soils are silty throughout. Inavale soils are excessively drained. They are sandy in the control section. They are higher on the landscape than the Ord soils.

The Ord soils in this county are taxadjuncts because they do not have a calcic horizon. This difference, however, does not affect the use and management of the soils.

Typical pedon of Ord loam, 0 to 2 percent slopes, 1,780 feet north and 1,100 feet east of the southwest corner of sec. 23, T. 32 N., R. 8 W.

- Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; slightly hard, friable; slight effervescence; about 1 percent calcium carbonate equivalent; mildly alkaline; abrupt smooth boundary.
- A—6 to 10 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; slight effervescence; about 1 percent calcium carbonate equivalent; mildly alkaline; clear smooth boundary.
- ACk1—10 to 14 inches; light gray (10YR 7/1) loam, gray (10YR 5/1) moist; weak coarse subangular blocky structure; slightly hard, friable; few fine streaks of lime; strong effervescence; about 6 percent calcium carbonate equivalent; moderately alkaline; clear smooth boundary.
- ACk2—14 to 24 inches; gray (10YR 6/1) fine sandy loam, dark gray (10YR 4/1) moist; weak coarse subangular blocky structure; few thin platy strata; slightly hard, friable; few fine streaks of lime; strong effervescence; about 5 percent calcium carbonate equivalent; moderately alkaline; clear smooth boundary.
- C1—24 to 34 inches; light gray (2.5Y 7/2) loamy fine sand, grayish brown (2.5Y 5/2) moist; few fine prominent reddish yellow (7.5YR 6/6 moist) mottles; weak coarse subangular blocky structure parting to weak thin platy; soft, very friable; few fine streaks of lime; strong effervescence; about 4 percent calcium carbonate equivalent; moderately alkaline; gradual smooth boundary.

C2—34 to 60 inches; light gray (2.5Y 7/2) fine sand, light brownish gray (2.5Y 6/2) moist; many medium prominent reddish yellow (7.5YR 6/6 moist) mottles; single grain; few thin platy strata; loose; slight effervescence; moderately alkaline.

The thickness of the mollic epipedon ranges from 10 to 20 inches. The depth to sandy material ranges from 20 to 35 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. It is typically fine sandy loam or loam, but the range includes very fine sandy loam and silt loam. The ACk horizon has hue of 2.5Y or 10YR, value of 5 to 7 (4 or 5 moist), and chroma of 1 or 2. In some pedons it has few faint reddish yellow to dark gray mottles. The ACk horizon typically is fine sandy loam, but in some pedons it has thin strata of loam, sandy loam, and loamy fine sand. The C horizon has hue of 2.5Y or 10YR, value of 6 to 8 (4 to 6 moist), and chroma of 2 or 3. It has few to many mottles. It is loamy fine sand, loamy sand, fine sand, or sand. In some pedons it has thin strata of finer textured material.

Ortello Series

The Ortello series consists of very deep, well drained, moderately rapidly permeable soils on uplands and stream terraces. These soils formed in sandy and loamy sediments. Slopes range from 0 to 6 percent.

Ortello soils are commonly adjacent to Bazile, Blendon, Loretto, Simeon, and Thurman soils. Bazile and Loretto soils have more clay in the subsoil than the Ortello soils. Blendon soils have a mollic epipedon more than 20 inches thick. They are slightly lower on the landscape than the Ortello soils. Simeon soils range from loamy sand to coarse sand in the control section. Thurman soils are sandy in the control section. They are slightly higher on the landscape than the Ortello soils.

Typical pedon of Ortello fine sandy loam, 2 to 6 percent slopes, 125 feet south and 1,125 feet west of the northeast corner of sec. 32, T. 29 N., R. 4 W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—7 to 14 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; slightly hard, friable; medium acid; clear wavy boundary.

Bw—14 to 24 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure parting to weak

medium subangular blocky; slightly hard, friable; slightly acid; gradual wavy boundary.

BC—24 to 40 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium prismatic structure; slightly hard, friable; neutral; gradual wavy boundary.

C—40 to 60 inches; very pale brown (10YR 7/4) loamy sand, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; soft, very friable; neutral.

The thickness of the solum ranges from 24 to 50 inches. The thickness of the mollic epipedon ranges from 8 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 to 3. It is typically fine sandy loam, but the range includes loamy fine sand, sandy loam, and loam. The B horizon has value of 4 to 6 (3 to 5 moist) and chroma of 2 to 4. It is fine sandy loam or sandy loam. The textures commonly become coarser as depth increases. The C horizon has value of 6 to 8 (5 or 6 moist) and chroma of 2 to 4. It typically is loamy sand or fine sand, but the range includes fine sandy loam, loamy fine sand, and loamy coarse sand.

Orwet Series

The Orwet series consists of very deep, poorly drained, rapidly permeable soils on bottom land. These soils formed in loamy and sandy alluvium. Slopes range from 0 to 2 percent.

Orwet soils are commonly adjacent to Barney, Kezan, Obert, and Ord soils. Barney and Obert soils are very poorly drained. They are lower on the landscape than the Orwet soils. Obert and Kezan soils contain more clay in the control section than the Orwet soils. Kezan soils are in landscape positions similar to those of the Orwet soils. Barney soils do not have a mollic epipedon. Ord soils are somewhat poorly drained. They have more silt and clay in the upper part of the control section than the Orwet soils. Also, they are higher on the landscape.

Typical pedon of Orwet loam, 0 to 2 percent slopes, 565 feet north and 205 feet east of the southwest corner of sec. 24, T. 29 N., R. 6 W.

Ak1—0 to 10 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate fine and very fine granular structure; slightly hard, friable; violent effervescence; about 7 percent calcium carbonate equivalent; moderately alkaline; clear smooth boundary.

Ak2—10 to 19 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak very fine granular structure; slightly hard, friable; strong

effervescence; about 6 percent calcium carbonate equivalent; moderately alkaline; gradual smooth boundary.

AC—19 to 25 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; common fine prominent reddish yellow (7.5YR 7/8 moist) mottles; weak medium subangular blocky structure; soft, very friable; mildly alkaline; gradual smooth boundary.

C—25 to 60 inches; light gray (2.5Y 7/2) sand, light brownish gray (2.5Y 6/2) moist; few fine prominent reddish yellow (7.5YR 7/8 moist) mottles; single grain; loose; neutral.

The thickness of the mollic epipedon ranges from 10 to 20 inches. Free carbonates extend to a depth of 10 to 30 inches. The calcium carbonate equivalent ranges from 5 to 10 percent in the mollic epipedon.

The Ak horizon has value of 3 to 5 (2 or 3 moist) and chroma of 0 or 1. It is typically loam, but the range includes sandy loam and silt loam. The AC horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 1 or 2. It has faint or distinct mottles. It is fine sandy loam, loamy sand, or sand. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 6 or 7 (5 or 6 moist), and chroma of 1 or 2. It has distinct or prominent mottles. It is typically sand or fine sand, but the range includes loamy fine sand and loamy sand. Some pedons have thin strata of finer textured material.

Paka Series

The Paka series consists of deep, well drained, moderately permeable and moderately slowly permeable soils on uplands. These soils formed in loamy or silty material weathered from siltstone bedrock. Slopes range from 0 to 30 percent.

Paka soils are commonly adjacent to Brunswick, Crofton, Longford, Moody, O'Neill, and Thurman soils. Brunswick soils do not have a mollic epipedon. They contain less clay in the control section than the Paka soils. Also, they are slightly lower on the landscape. Crofton soils have a thin surface layer. They are calcareous throughout. They formed in silty loess. Longford and Moody soils are in landscape positions similar to those of the Paka soils. Longford soils formed in finer textured sediments than those in which the Paka soils formed. They have pinkish colors. Moody soils formed in loess. O'Neill and Thurman soils are higher on the landscape than the Paka soils. O'Neill soils have less clay in the subsoil than the Paka soils. They are moderately deep over gravelly coarse sand. Thurman soils are sandy.

Typical pedon of Paka loam, 2 to 6 percent slopes, 1,550 feet west and 220 feet south of the northeast

corner of sec. 3, T. 29 N., R. 6 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary.

A—7 to 10 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, firm; neutral; clear wavy boundary.

Bt—10 to 25 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; neutral; clear wavy boundary.

Bk—25 to 32 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak coarse subangular blocky; hard, firm; violent effervescence; common fine soft accumulations of carbonates; moderately alkaline; gradual wavy boundary.

C1—32 to 40 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure; hard, firm; violent effervescence; few fine soft accumulations of carbonates; moderately alkaline; gradual wavy boundary.

C2—40 to 54 inches; white (2.5Y 8/2) silty clay loam, light gray (2.5Y 7/2) moist; massive; hard, firm; violent effervescence; few fine soft accumulations of carbonates; moderately alkaline; clear smooth boundary.

Cr—54 to 60 inches; white (2.5Y 8/2), weakly cemented siltstone bedrock, light gray (2.5Y 7/2) moist; massive; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 38 inches. The depth to free carbonates ranges from 16 to 30 inches. The depth to siltstone bedrock ranges from 40 to 60 inches.

The A horizon has value of 4 or 5 (2 to 4 moist) and chroma of 1 or 2. It is silty clay loam, silt loam, loam, or fine sandy loam. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 2 or 3. It is silty clay loam, silt loam, or clay loam. The Bk horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 or 3. It is silty clay loam, clay loam, or loam. The C horizon has hue of 2.5Y, 5Y, or 10YR, value of 7 or 8 (5 to 7 moist), and chroma of 2 or 3. It is dominantly silty clay loam, but the range includes very fine sandy loam and silt loam. The Cr horizon has hue of 2.5Y or 5Y, value of 7 or 8 (6 or 7 moist), and chroma of 2 or 3.

The Paka soils in map units BxE and BxF are taxadjuncts because they are fine-loamy in the control section and have bedrock at a depth of 30 to 40 inches.

These differences, however, do not affect the use and management of the soils.

Percival Series

The Percival series consists of very deep, somewhat poorly drained soils on bottom land. These soils formed in alluvium. Permeability is slow in the upper part and rapid in the lower part. Slopes range from 0 to 2 percent.

Percival soils are commonly adjacent to Aowa, Onawa, and Solomon soils. Aowa soils are well drained. They are silty throughout. They are slightly higher on the landscape than the Percival soils. Onawa soils are loamy in the lower part. Solomon soils are clayey throughout. They are poorly drained. They are slightly lower on the landscape than the Percival soils.

Typical pedon of Percival silty clay, 0 to 2 percent slopes, 2,000 feet east and 500 feet south of the northwest corner of sec. 29, T. 33 N., R. 7 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; very hard, very firm; slight effervescence; moderately alkaline; abrupt smooth boundary.

Cg—8 to 21 inches; stratified grayish brown (2.5Y 5/2) and light brownish gray (2.5Y 6/2) silty clay, very dark grayish brown (2.5Y 3/2) and dark grayish brown (2.5Y 4/2) moist; common fine prominent reddish yellow (7.5YR 6/6 moist) mottles; moderate fine and very fine angular blocky structure; very hard, very firm; strong effervescence; moderately alkaline; abrupt smooth boundary.

2C—21 to 60 inches; stratified, light gray (2.5Y 7/2) fine sand and loamy fine sand, light brownish gray (2.5Y 6/2) moist; few fine prominent reddish yellow (7.5YR 6/6 moist) mottles; single grain; loose; slight effervescence; moderately alkaline.

The upper part of the control section is clay or silty clay, and the lower part is stratified loamy fine sand or fine sand. Carbonates are typically throughout the profile.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4 (2 or 3 moist), and chroma of 1 or 2. The 2C horizon has value of 5 to 7 (4 to 6 moist) and chroma of 2. It commonly has thin lenses of finer textured material in the lower part.

Redstoe Series

The Redstoe series consists of moderately deep, well drained, moderately permeable soils on uplands. These soils formed in material weathered from soft, calcareous

siltstone bedrock. Slopes range from 6 to 25 percent.

Redstoe soils are commonly adjacent to Crofton, Eltree, Gavins, Labu, and Verdigre soils. Crofton and Eltree soils are very deep. Crofton and Gavins soils do not have a mollic epipedon. Crofton soils formed in loess. They are higher on the landscape than the Redstoe soils. Eltree soils have a mollic epipedon more than 20 inches thick. Eltree and Gavins soils are lower on the landscape than the Redstoe soils. Gavins soils are shallow over bedrock. Labu soils have more clay throughout than the Redstoe soils. Also, they are slightly higher on the landscape. Verdigre soils are deep over shale bedrock. They have more clay in the lower part than the Redstoe soils.

Typical pedon of Redstoe silt loam, 6 to 11 percent slopes, 3,100 feet north and 550 feet east of the southwest corner of sec. 17, T. 33 N., R. 4 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable; few fragments of soft siltstone channers; strong effervescence; about 8 percent calcium carbonate equivalent; moderately alkaline; abrupt smooth boundary.

A—6 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable; few fragments of soft siltstone channers; strong effervescence; about 9 percent calcium carbonate equivalent; moderately alkaline; clear smooth boundary.

Bk1—10 to 19 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few fragments of soft siltstone channers; few fine concretions of lime; violent effervescence; about 35 percent calcium carbonate equivalent; moderately alkaline; clear wavy boundary.

Bk2—19 to 25 inches; very pale brown (10YR 7/3) silt loam, light yellowish brown (10YR 6/4) moist; weak medium prismatic structure; slightly hard, friable; few fragments of soft siltstone channers; few fine concretions of lime; violent effervescence; about 50 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

C—25 to 31 inches; very pale brown (10YR 8/4) silt loam, yellow (10YR 7/6) moist; weak medium prismatic structure parting to weak thick platy; slightly hard, friable; few fragments of soft siltstone channers; few concretions of lime and threads and nests of gypsum; violent effervescence; about 65 percent calcium carbonate equivalent; moderately

alkaline; gradual wavy boundary.

Cr—31 to 60 inches; yellow (10YR 8/6), soft siltstone bedrock, yellow (10YR 7/6) moist; massive; hard, firm; few threads and nests of lime and gypsum between planes of rock fractures; violent effervescence; about 50 percent calcium carbonate equivalent; moderately alkaline.

The thickness of the solum ranges from 11 to 35 inches. The depth to carbonates ranges from 0 to 6 inches. The thickness of the mollic epipedon ranges from 7 to 12 inches. The depth to soft, calcareous siltstone bedrock ranges from 20 to 40 inches. The calcium carbonate equivalent ranges from 30 to 70 percent in the control section.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 to 3. It is typically silt loam, but the range includes loam. The Bk horizon has hue of 10YR or 2.5Y, value of 4 to 8 (3 to 6 moist), and chroma of 2 to 4. It is dominantly silt loam, but the range includes loam or silty clay loam. The C and Cr horizons have hue of 10YR or 2.5Y, value of 6 to 8 (4 to 7 moist), and chroma of 3 to 6.

Sansarc Series

The Sansarc series consists of shallow, well drained, slowly permeable soils on uplands. These soils formed in clayey material weathered from dark shale bedrock (fig. 20). Slopes range from 11 to 60 percent.

Sansarc soils are commonly adjacent to Bristow, Gavins, Labu, Lynch, and Verdel soils. Bristow, Lynch, and Labu soils are slightly lower on the landscape than the Sansarc soils. Bristow and Lynch soils formed in light colored shale bedrock. They have more gypsum than the Sansarc soils. Lynch soils are 20 to 40 inches deep to shale bedrock. Bristow and Gavins soils are less than 20 inches deep to shale bedrock. Gavins soils contain less clay than the Sansarc soils. Gavins and Verdel soils are lower on the landscape than the Sansarc soils. Verdel soils are very deep. They have a thick mollic epipedon. Labu soils are 20 to 40 inches deep to dark shale bedrock.

Typical pedon of Sansarc silty clay, in an area of Labu-Sansarc complex, 11 to 30 percent slopes; 300 feet east and 700 feet north of the southwest corner of sec. 16, T. 30 N., R. 6 W.

A—0 to 4 inches; dark grayish brown (2.5Y 4/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; weak fine angular blocky structure parting to weak very fine granular; very hard, very firm; about 5 percent, by volume, shale channers; strong effervescence; mildly alkaline; clear smooth boundary.

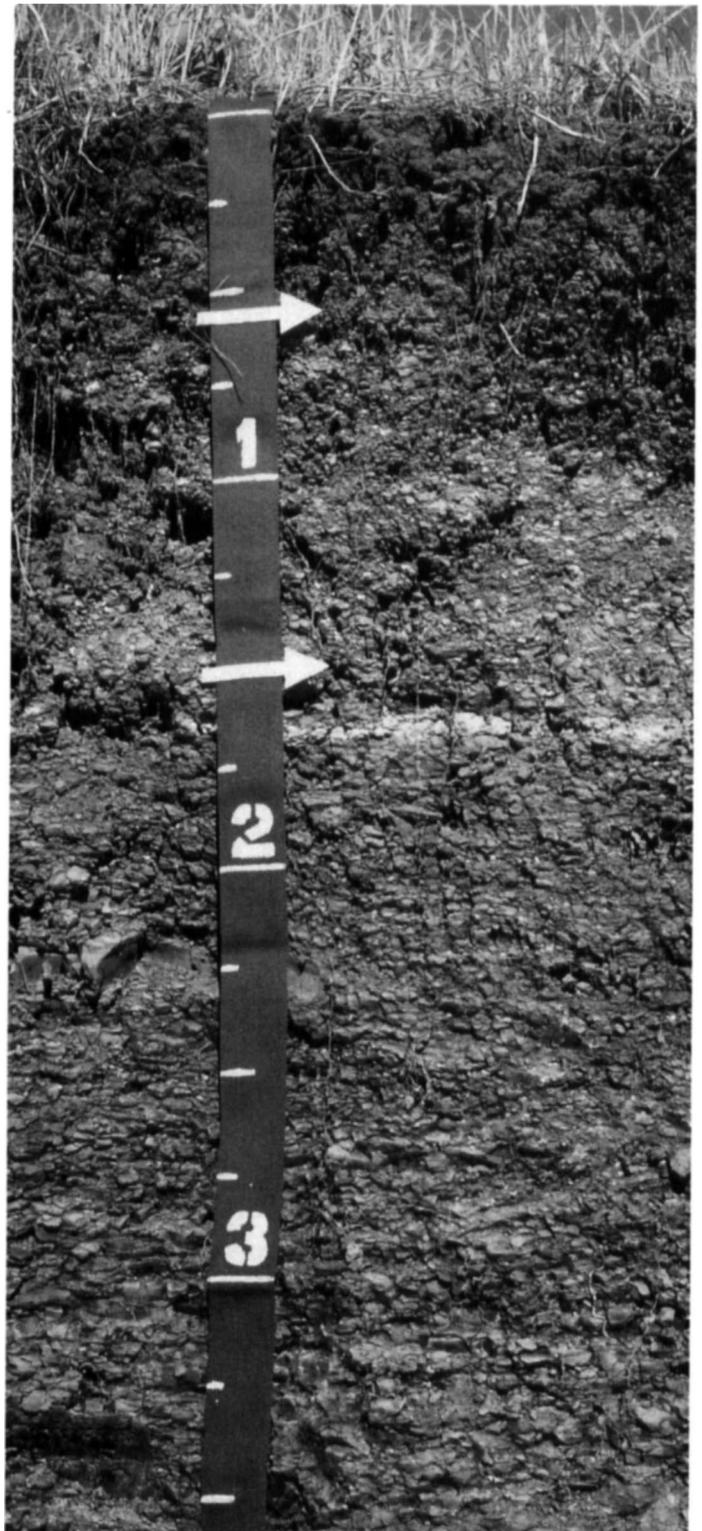


Figure 20.—Profile of a Sansarc silty clay. The bottom arrow marks the upper boundary of the bedded shale. Depth is marked in feet.

AC—4 to 9 inches; olive gray (5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; moderate medium angular blocky structure; very hard, very firm; about 10 percent, by volume, shale channers; accumulations of carbonates in cracks and seams; strong effervescence; mildly alkaline; gradual wavy boundary.

C—9 to 18 inches; light olive gray (5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; strong thin platy structure; very hard, very firm; about 9 percent, by volume, shale channers; strong effervescence; moderately alkaline; gradual wavy boundary.

Cr—18 to 60 inches; light gray (5Y 7/2) shale bedrock, dark gray (5Y 4/1) moist; strong thick platy structure; extremely hard, extremely firm; strong effervescence; moderately alkaline.

The depth to shale bedrock ranges from 6 to 20 inches.

The A horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 or 2. It is silty clay or clay. Few to many shale channers are on the surface and throughout the A horizon. The C horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6 (4 or 5 moist), and chroma of 1 or 2. It has many shale channers throughout. In some pedons it has varying amounts of carbonates and gypsum. The Cr horizon has hue of 2.5Y or 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 or 2. It has varying amounts of carbonates and gypsum in the cracks and seams.

Scott Series

The Scott series consists of very deep, poorly drained, very slowly permeable soils in upland depressions. These soils formed in loess. Slopes are 0 to 1 percent.

Scott soils are commonly adjacent to Butler, Fillmore, Moody, and Trent soils. Butler, Moody, and Trent soils are higher on the landscape than the Scott soils. Butler soils are better drained than the Scott soils. Moody and Trent soils have less clay in the B horizon than the Scott soils. They are well drained or moderately well drained. The combined thickness of the A and E horizons in the Fillmore soils is thicker than that in the Scott soils. Also, Fillmore soils are ponded for shorter periods than the Scott soils.

Typical pedon of Scott silt loam, 0 to 1 percent slopes, 1,000 feet south and 500 feet west of the northeast corner of sec. 28, T. 29 N., R. 4 W.

A—0 to 5 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; common fine prominent reddish yellow (5YR 6/6 moist) mottles; moderate very fine granular structure; slightly hard, friable;

medium acid; abrupt smooth boundary.

E—5 to 9 inches; light gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; moderate thin platy structure; slightly hard, friable; medium acid; abrupt smooth boundary.

Bt1—9 to 24 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm; clay films on faces of peds; many small concretions of manganese; slightly acid; gradual smooth boundary.

Bt2—24 to 42 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm; many small concretions of manganese; slightly acid; gradual smooth boundary.

BC—42 to 55 inches; gray (10YR 5/1) silty clay, dark gray (10YR 4/1) moist; weak medium prismatic structure; very hard, very firm; few small concretions of manganese; slightly acid; gradual smooth boundary.

C—55 to 60 inches; light brownish gray (10YR 6/2) silty clay loam, grayish brown (10YR 5/2) moist; massive; hard, firm; few small concretions of manganese; neutral.

The thickness of the solum ranges from 27 to 56 inches. The thickness of the mollic epipedon ranges from 19 to 46 inches. The depth to carbonates ranges from 35 to more than 60 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 1 or 2. The E horizon has value of 5 or 6 (4 or 5 moist). The Bt horizon has value of 3 to 5 (2 to 4 moist) and chroma of 0 to 2. It is silty clay or clay. The C horizon has value of 5 to 7 (4 to 6 moist) and chroma of 2 to 4.

Shell Series

The Shell series consists of very deep, well drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Shell soils are commonly adjacent to Alcester, Aowa, Coleridge, Hobbs, and Hord soils. Alcester, Coleridge, and Hord soils are not stratified. Alcester soils are on colluvial foot slopes. Aowa and Hobbs soils do not have a mollic epipedon. They are stratified in the upper part. Aowa, Hobbs, and Coleridge soils are lower on the landscape than the Shell soils. Coleridge soils are somewhat poorly drained. Hord soils have a B horizon. They are higher on the landscape than the Shell soils.

Typical pedon of Shell silt loam, 0 to 2 percent slopes, 1,700 feet south and 60 feet west of the

northeast corner of sec. 20, T. 30 N., R. 3 W.

- Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary.
- A1—5 to 15 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable; neutral; clear smooth boundary.
- A2—15 to 24 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; strong fine granular structure; slightly hard, friable; neutral; clear smooth boundary.
- C—24 to 33 inches; grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 4/2) moist; dominantly massive but has thin platy structure in places because of stratification; slightly hard, friable; neutral; clear smooth boundary.
- Ab—33 to 50 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure parting to weak very fine subangular blocky; slightly hard, friable; neutral; clear smooth boundary.
- C'—50 to 60 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; neutral.

The thickness of the solum and of the mollic epipedon ranges from 20 to 36 inches. The depth to carbonates is more than 48 inches. Buried soils are common below a depth of 30 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 to 3. It is silt loam or silty clay loam. The C horizon has value of 4 to 6 (3 to 5 moist) and chroma of 2 or 3. It is typically silt loam or silty clay loam, but the range includes loam.

Simeon Series

The Simeon series consists of very deep, excessively drained, rapidly permeable soils on uplands and stream terraces. These soils formed in sandy alluvium and outwash material. Slopes range from 0 to 30 percent.

Simeon soils are commonly adjacent to Meadin, O'Neill, Thurman, and Valentine soils. Meadin, O'Neill, and Thurman soils have a mollic epipedon. Meadin soils have gravelly coarse sand within a depth of 20 inches. O'Neill soils have gravelly coarse sand within a depth of 20 to 40 inches. Thurman and Valentine soils have less medium and coarse sand than the Simeon soils. Also, they are higher on the landscape.

Typical pedon of Simeon sand, 6 to 30 percent slopes, eroded, 1,000 feet south and 330 feet west of the center of sec. 11, T. 31 N., R. 7 W.

- A—0 to 5 inches; grayish brown (10YR 5/2) sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; about 2 percent gravel, by volume; slightly acid; gradual wavy boundary.
- AC—5 to 13 inches; grayish brown (10YR 5/2) sand, dark grayish brown (10YR 4/2) moist; single grain; loose; about 2 percent gravel, by volume; slightly acid; gradual wavy boundary.
- C1—13 to 50 inches; very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; loose; about 5 percent gravel, by volume; slightly acid; gradual wavy boundary.
- C2—50 to 60 inches; white (10YR 8/2) sand, light gray (10YR 7/2) moist; single grain; loose; slightly acid.

The A horizon has value of 4 or 5 (2 to 4 moist) and chroma of 1 or 2. It is sand, loamy sand, or sandy loam. The AC horizon has value of 5 or 6 (4 or 5 moist) and chroma of 2 or 3. It is sand or loamy sand. The C horizon has value of 6 to 8 (5 to 7 moist) and chroma of 2 or 3. It is sand, loamy sand, or coarse sand. The content of gravel is as much as 15 percent, by volume.

Solomon Series

The Solomon series consists of very deep, poorly drained, very slowly permeable soils on bottom land. These soils formed in calcareous, clayey alluvium. Slopes range from 0 to 2 percent.

Solomon soils are commonly adjacent to Albaton, Blyburg, Inavale, and Onawa soils. Albaton soils are poorly drained and very poorly drained. They are in the lower areas of bottom land. They are stratified in the upper part of the profile. Blyburg soils are well drained and loamy. Inavale soils are excessively drained and sandy. Blyburg and Inavale soils are higher on the landscape than the Solomon soils. Onawa soils are somewhat poorly drained. They have less clay in the lower part than the Solomon soils.

Typical pedon of Solomon silty clay, 0 to 2 percent slopes, 1,400 feet east and 1,250 feet south of the northwest corner of sec. 20, T. 33 N., R. 7 W.

- Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; very hard, very firm; strong effervescence; moderately alkaline; abrupt smooth boundary.
- A—6 to 20 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; few medium distinct dark yellowish brown (10YR 4/4 moist) mottles; moderate fine and very fine angular blocky structure; very hard, very firm; few pressure faces; strong effervescence; moderately alkaline; gradual smooth boundary.

Bg—20 to 40 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; common medium prominent brownish yellow (10YR 6/6 moist) mottles; weak coarse angular blocky structure parting to weak fine angular blocky; very hard, very firm; common pressure faces; strong effervescence; moderately alkaline; gradual smooth boundary.

Cg—40 to 60 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; common fine prominent reddish yellow (7.5YR 6/6 moist) mottles; massive; very hard, very firm; strong effervescence; moderately alkaline.

The depth to carbonates is less than 10 inches. The thickness of the mollic epipedon ranges from 15 to more than 40 inches. The texture is silty clay or clay throughout the profile.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4 (2 or 3 moist), and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5 (2 to 4 moist), and chroma of 1 or 2. The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 1 or 2.

Thurman Series

The Thurman series consists of very deep, somewhat excessively drained, rapidly permeable soils on uplands and stream terraces. These soils formed in sandy eolian material (fig. 21). Slopes range from 0 to 30 percent.

Thurman soils are commonly adjacent to Bazile, Loretto, Ortello, Simeon, and Valentine soils. Bazile, Loretto, and Ortello soils contain more silt and clay than the Thurman soils. Also, they are slightly lower on the landscape. They are well drained. They have a B horizon. Simeon soils contain more medium and coarse sand than the Thurman soils. Also, they are lower on the landscape. Simeon and Valentine soils do not have a mollic epipedon. Valentine soils are excessively drained. They are higher on the landscape than the Thurman soils.

Typical pedon of Thurman loamy fine sand, 3 to 6 percent slopes, 420 feet north and 1,200 feet west of the southeast corner of sec. 19, T. 30 N., R. 8 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable; medium acid; abrupt smooth boundary.

A—6 to 14 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark brown (10YR 2/2) moist; weak very coarse prismatic structure parting to weak very fine granular; soft, very friable; medium acid; gradual wavy boundary.

AC—14 to 18 inches; grayish brown (10YR 5/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose; medium acid; gradual wavy boundary.

C1—18 to 45 inches; pale brown (10YR 6/3) fine sand, brown (10YR 5/3) moist; single grain; loose; medium acid; gradual wavy boundary.

C2—45 to 60 inches; very pale brown (10YR 7/3) sand, brown (10YR 5/3) moist; single grain; loose; slightly acid.

The thickness of the solum ranges from 14 to 30 inches. The thickness of the mollic epipedon ranges from 10 to 20 inches.

The A horizon has value of 3 to 5 (2 or 3 moist) and chroma of 1 or 2. The AC horizon has value of 4 to 6 (3 or 4 moist) and chroma of 2 or 3. The texture of the A and AC horizons ranges from sand to fine sandy loam. The C horizon has value of 6 or 7 (4 or 5 moist) and chroma of 2 to 4. It is typically fine sand or sand, but the range includes loamy fine sand, loamy sand, and very fine sand.

Trent Series

The Trent series consists of very deep, well drained and moderately well drained, moderately permeable soils in swales on uplands. These soils formed in silty sediments. Slopes range from 0 to 2 percent.

Trent soils are commonly adjacent to Bazile, Butler, Eltree, Fillmore, and Moody soils. Bazile and Moody soils have a mollic epipedon less than 20 inches thick. They are higher on the landscape than the Trent soils. Butler and Fillmore soils contain more clay in the B horizon than the Trent soils. They are somewhat poorly drained and poorly drained. Fillmore soils are slightly lower on the landscape than the Trent soils. Eltree soils have free carbonates at a depth of less than 15 inches. They are on foot slopes.

Typical pedon of Trent silt loam, 0 to 2 percent slopes, 1,300 feet west and 1,850 feet north of the southeast corner of sec. 1, T. 29 N., R. 6 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable; medium acid; abrupt smooth boundary.

A—8 to 20 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure parting to moderate fine granular; slightly hard, friable; slightly acid; gradual wavy boundary.

Bw1—20 to 32 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist, very dark grayish brown (10YR 3/2) crushed and moist; moderate fine subangular blocky structure;



Figure 21.—Profile of a Thurman loamy fine sand. The arrow marks the lower boundary of the surface soil. Depth is marked in feet.

hard, firm; neutral; gradual wavy boundary.

Bw2—32 to 45 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm; neutral; gradual wavy boundary.

Bw3—45 to 54 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm; neutral; gradual wavy boundary.

C—54 to 60 inches; pale brown (10YR 6/3) silty clay

loam, brown (10YR 5/3) moist; few fine distinct yellowish brown (10YR 5/6 moist) relict mottles; weak coarse prismatic structure; slightly hard, friable; few fine concretions of lime; slight effervescence; moderately alkaline.

The thickness of the mollic epipedon ranges from 20 to 40 inches. The depth to carbonates ranges from 30 to 60 inches. The thickness of the solum ranges from 35 to 55 inches.

The A horizon has value of 3 or 4 (2 or 3 moist) and chroma of 1 or 2. It is typically silt loam, but the range includes silty clay loam. The Bw horizon has value of 4 to 6 (2 to 5 moist) and chroma of 2 or 3. It is typically clay loam, but the range includes silt loam. The C horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 or 3. It is silt loam or silty clay loam.

Valentine Series

The Valentine series consists of very deep, excessively drained, rapidly permeable soils on uplands. These soils formed in sandy eolian material. Slopes range from 3 to 24 percent.

Valentine soils are commonly adjacent to Ortello, Simeon, and Thurman soils. Ortello, Thurman, and Simeon soils are lower on the landscape than the Valentine soils. Ortello and Thurman soils have a mollic epipedon. Ortello soils contain more silt and clay in the solum than the Valentine soils. They are well drained. Simeon soils contain more medium and coarse sand than the Valentine soils.

Typical pedon of Valentine fine sand, 3 to 9 percent slopes, 1,550 feet north and 130 feet east of the southwest corner of sec. 15, T. 31 N., R. 7 W.

A—0 to 6 inches; grayish brown (10YR 5/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose; many very fine roots; medium acid; clear smooth boundary.

AC—6 to 12 inches; light brownish gray (10YR 6/2) fine sand, grayish brown (10YR 5/2) moist; single grain; loose; common very fine roots; medium acid; clear smooth boundary.

C—12 to 60 inches; very pale brown (10YR 7/3) fine sand, pale brown (10YR 6/3) moist; single grain; loose; few very fine roots to a depth of 40 inches; medium acid.

The A horizon has value of 4 to 6 (3 to 5 moist) and chroma of 2 or 3. It is dominantly fine sand, but the range includes loamy fine sand and sand. The AC horizon, if it occurs, has value of 5 to 7 (4 to 6 moist) and chroma of 2 or 3. It is fine sand or sand. The C

horizon has value of 6 or 7 (5 or 6 moist) and chroma of 2 to 4. It is fine sand or sand.

Verdel Series

The Verdel series consists of very deep, well drained, slowly permeable soils on foot slopes and stream terraces. These soils formed in clayey alluvium. Slopes range from 0 to 11 percent.

Verdel soils are commonly adjacent to Labu, Lynch, Sansarc, and Trent soils. Labu, Lynch, and Sansarc soils do not have a mollic epipedon. Labu and Lynch soils have shale bedrock at a depth of 20 to 40 inches. Sansarc soils have shale bedrock at a depth of 6 to 20 inches. Trent soils are higher on the landscape than the Verdel soils. Also, they contain less clay.

Typical pedon of Verdel silty clay, 0 to 2 percent slopes, 1,300 feet south and 85 feet west of the center of sec. 24, T. 32 N., R. 7 W.

- Ap—0 to 6 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; moderate very fine granular structure; very hard, very firm; neutral; abrupt smooth boundary.
- A—6 to 16 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; moderate fine angular blocky structure parting to moderate fine granular; very hard, very firm; neutral; clear wavy boundary.
- Bw1—16 to 26 inches; dark gray (10YR 4/1) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium angular blocky structure; very hard, very firm; strong effervescence; mildly alkaline; clear wavy boundary.
- Bw2—26 to 34 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate fine prismatic structure parting to moderate medium angular blocky; very hard, very firm; few pressure faces; violent effervescence; mildly alkaline; clear wavy boundary.
- Bw3—34 to 46 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate coarse angular blocky; very hard, very firm; common fine concretions of lime; common pressure faces; few slickensides that do not intersect; violent effervescence; moderately alkaline; gradual wavy boundary.
- C—46 to 60 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, very firm; common fine concretions of lime; violent effervescence; moderately alkaline.

The thickness of the solum ranges from 25 to 55 inches. The depth to carbonates ranges from 16 to 35

inches. The mollic epipedon ranges from 20 to 36 inches in thickness. It extends into the upper part of the B horizon.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 1 or 2. It is typically silty clay, but the range includes silty clay loam. The B horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 1 to 3. It is silty clay or clay. It has concretions of lime. The C horizon has hue of 2.5Y or 5Y, value of 4 to 6 (4 or 5 moist), and chroma of 2 to 4. It is silty clay or clay.

Verdigre Series

The Verdigre series consists of deep, well drained soils on uplands. These soils formed in loamy eolian material over material weathered from clayey shale bedrock. Permeability is moderately slow in the upper part and slow in the lower part. Slopes range from 2 to 30 percent.

Verdigre soils are commonly adjacent to Crofton, Labu, Lynch, Nora, Paka, and Thurman soils. Crofton, Nora, Paka, and Thurman soils are higher on the landscape than the Verdigre soils. Crofton, Nora, and Paka soils have more silt and less sand in the control section than the Verdigre soils. They do not have shale bedrock below a depth of 40 inches. Crofton, Labu, and Lynch soils do not have a mollic epipedon. Labu and Lynch soils have more clay in the control section than the Verdigre soils. They have shale bedrock at a depth of 20 to 40 inches. Thurman soils are sandy in the control section.

Typical pedon of Verdigre loam, 2 to 6 percent slopes, 700 feet south and 270 feet east of the northwest corner of sec. 36, T. 31 N., R. 7 W.

- Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable; common very fine roots; slightly acid; abrupt smooth boundary.
- A—6 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate very fine granular; slightly hard, friable; few very fine roots; slightly acid; clear smooth boundary.
- Bt1—10 to 16 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure parting to moderate fine subangular blocky; hard, firm; few very fine roots; few discontinuous clay films on faces of peds; neutral; gradual wavy boundary.
- Bt2—16 to 25 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak fine prismatic

structure parting to moderate medium subangular blocky; hard, firm; few very fine roots; few discontinuous clay films on faces of peds; neutral; clear wavy boundary.

2BC—25 to 42 inches; light gray (2.5Y 7/2) and olive yellow (2.5Y 6/6) silty clay, light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/6) moist; moderate coarse angular blocky structure parting to moderate medium angular blocky; very hard, very firm; few very fine roots; slight effervescence; many seams and pockets of soft carbonates; moderately alkaline; gradual wavy boundary.

2C—42 to 56 inches; light gray (5Y 7/2) and olive yellow (2.5Y 6/6) silty clay, light olive gray (5Y 6/2) and light olive brown (2.5Y 5/6) moist; massive; very hard, very firm; few very fine roots; 2 to 5 percent, by volume, shale channers; slight effervescence; many seams and pockets of soft carbonates; moderately alkaline; gradual wavy boundary.

2Cr—56 to 60 inches; light gray (5Y 7/2) and yellowish brown (10YR 5/6) shale bedrock, light olive gray

(5Y 6/2) and dark yellowish brown (10YR 4/6) moist; massive; very hard, very firm; slight effervescence; few seams and pockets of soft carbonates; moderately alkaline.

The thickness of the solum ranges from 30 to 50 inches. The thickness of the mollic epipedon ranges from 7 to 20 inches. The depth to carbonates ranges from 18 to 35 inches. The depth to shale bedrock ranges from 40 to 60 inches.

The A horizon has value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. It is loam or fine sandy loam. The Bt horizon has hue of 10YR, value of 5 or 6 (4 or 5 moist), and chroma of 2 or 3. It is loam, clay loam, or silty clay loam. The 2BC horizon has hue of 10YR to 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 6. It is silty clay or clay. The average content of clay is 45 to 60 percent. The 2C horizon has hue of 10YR to 5Y, value of 5 to 7 (4 to 6 moist), and chroma of 1 to 6. It is silty clay or clay. It has 0 to 15 percent, by volume, shale channers. The 2Cr horizon has hue of 10YR to 5Y, value of 5 to 8 (4 to 7 moist), and chroma of 1 to 6.

Factors of Soil Formation

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

Climate and plant and animal life, mainly plants, are active factors of soil formation. They act on the parent material, which has been transported or accumulated through the weathering of rocks, and slowly change it into a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. The parent material affects the kind of soil that forms. Finally, time is needed for the transformation of the parent material into a soil. Generally, a long time is required for the development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other four.

Parent Material

Parent material is the unconsolidated material from which a soil forms. It is largely responsible for the chemical and mineralogical composition of the soil. The soils of Knox County formed in material transported by wind, water, or glacial ice and in material weathered from the underlying geologic formations.

The Niobrara Formation is the oldest geologic material exposed in Knox County. It occurs as vertical cliffs or on the lower side slopes along Lewis and Clark Lake and the Missouri River valley. Smaller areas are adjacent to the Niobrara River, Ponca Creek, and Bazile Creek. The Niobrara Formation consists of chalk, calcareous shale, and shaly limestone that is massive and restricts plant roots but that can be dug with a spade or moved with machinery. The rock weathers to

medium textured soil material. Gavins and Redstoe soils formed in material weathered from the Niobrara Formation.

The Pierre Shale overlies the Niobrara Formation. It is mostly exposed in areas north of the Niobrara River, south of the Missouri River, and east of Niobrara along Lewis and Clark Lake. It also is exposed on the lower side slopes that are adjacent to Bazile Creek, Howe Creek, and Verdigris Creek and their tributaries. The Pierre Shale can be subdivided into three members. In ascending order, these members consist of an unnamed member, the Moberg member, and the Elk Butte member.

The unnamed member is dark gray bentonitic shale. This shale consists of marine deposits. It weathers to fine textured soil material. Labu and Sansarc soils formed in this material.

The Moberg member consists of beds of shaly chalk and calcareous shale that are olive brown to pale yellow. This shale weathers to fine textured soil material that has a high content of lime gypsum. Bristow and Lynch soils formed in this material.

The Elk Butte member consists mostly of dark gray shale and claystone. In areas where this member is exposed, it weathers to olive gray, fine textured soil material. Labu and Sansarc soils formed in this material.

The Ogallala Group overlies the Pierre Shale. It makes up the surface material for most side slopes and for some divides along Verdigris Creek and its tributaries in the southern part of the county. It also is on some middle and upper side slopes in other parts of the county. The sandstone or siltstone bedrock is weakly cemented and restricts plant roots, but it can be dug with a spade or moved easily with machinery. Both calcareous and noncalcareous strata are in Knox County. A few pseudoquartzite rocks or ledges occur in the formation. The sandstone weathers to grayish brown to light gray, moderately coarse textured material. Brunswick soils formed in this material. The siltstone weathers to light gray and brownish gray, medium textured and moderately fine textured material. Mariaville and Paka soils formed mostly in this material.

Unconsolidated deposits of clay, silt, sand, and gravel were deposited in widely different topographic positions by streams and wind during the Pleistocene age. Pleistocene deposits of silt are on the upper side slopes in the southwestern, central, and northeastern parts of the county. The light gray or light brownish gray, calcareous, silty material has a few large concretions of lime and relict mottles. Crofton and Paka soils formed in this material.

In some areas in the southwestern, central, and northeastern parts of the county, outwash gravel and gravelly sand cap the Ogallala Formation or the Pleistocene deposits of silt. Areas of gravelly soils east of Bazile Creek have a few glacial stones and are commonly underlain by glacial till. Outwash pebbles are on the surface of some nearly level uplands near the Holt County line but are mainly on narrow ridges and side slopes. Meadin and O'Neill soils formed in the droughty outwash gravel and gravelly sands.

Glacial till overlies the Ogallala Formation and the Pleistocene deposits of silt east of Bazile Creek. It is on ridges and side slopes south and west of Crofton and Lindy and east of Center. A few other areas of glacial till are exposed in southeastern Knox County. The glacial till is firm, massive, light gray, moderately fine textured material that has reddish yellow relict mottles. It is calcareous and has seams and masses of lime. A few stones and pebbles occur throughout the deposits. Betts soils formed in this glacial till.

Outwash sand overlies the glacial till in the eastern part of Knox County and the Ogallala sandstone or Pleistocene deposits of silt in the western and northern parts of the county. Most of these areas have remnants of alluvium that were deposited before the streams were cut down to their present level. This alluvium is in areas of a few nearly level to gently sloping high tablelands but is mainly on narrow ridgetops and the upper side slopes. It consists of loose, single grain, very pale brown sand to coarse sand that contains a few pebbles and stones. Simeon soils formed in this material.

Most upland soils formed in Peorian loess. Thick deposits of the silty, wind-transported material are on the surface in the Lindy, Bloomfield, and Wausa areas. Smaller areas are west of Center, northeast of Creighton, and southwest of Verdigre. The topography is generally strongly sloping but ranges from nearly level divides to very steep side slopes. The loess is very pale brown, friable, medium textured material. It is calcareous and has accumulations and concretions of lime. Butler, Crofton, Fillmore, Moody, Nora, Scott, and Trent soils formed in this material.

Thin deposits of loess and some deposits of outwash silt that commonly range from 1 to 6 feet in thickness are north of Crofton and throughout the western half of

Knox County. These deposits are on nearly level or gently sloping divides and on the strongly sloping to steep upper side slopes. This material is commonly leached of lime in the upper 2 to 4 feet. Trent, Loretto, Bazile, and Verdigre soils formed entirely or partially in this material.

Sandy eolian material is the most recently deposited parent material in the uplands. It is on the surface in areas south of the Niobrara River and throughout the Verdigris Creek watershed. Other areas occur near Creighton, east of Center, and southwest of Verdel. Sandy eolian material was deposited by wind and is on low hummocks and dunes or on smooth side slopes. It is loose, single grain, pale brown or very pale brown, and moderately coarse textured or coarse textured. The upper part of the Boelus soils and Blendon, Elsmere, Ortello, Thurman, and Valentine soils formed in this material.

Colluvial material accumulates as a result of the combined forces of gravity and water. It is on foot slopes at the base of hills in the clayey and silty uplands. Alcester soils formed in this material.

Alluvial material is on bottom land and stream terraces. This sandy to clayey material has been deposited by streams. It is still being deposited by floodwater in most areas on bottom land. Albaton, Aowa, Barney, Blyburg, Boel, Gibbon, Hobbs, Inavale, Kezan, Onawa, Ord, Orwet, Percival, Shell, and Solomon soils and Fluvaquents formed in alluvial material on bottom land. The oldest alluvial material is on stream terraces, which are above the present flood plain and are not subject to flooding. Blendon, Elsmere, Eltree, Hord, O'Neill, Ortello, Simeon, Thurman, and Verdel soils formed in alluvial material on stream terraces.

Climate

The effects of climate on soil development are fairly uniform throughout Knox County. Precipitation, temperature, and wind directly influence soil formation.

Climate affects the weathering and formation of soils through its influence on the rate at which rain, temperature, and wind weather and rework the parent material. The average annual precipitation in the county is about 23 inches, which is sufficient moisture for the development of a dark surface soil and a moderate amount of organic matter in such soils as Loretto, Moody, and Nora soils. In these soils, the surface layer and the upper part of the subsoil have been leached of lime and the lower part of the subsoil or the underlying material has an accumulation of lime. In areas of Bazile soils, moisture has moved some clay from the surface layer into the subsoil. Sufficient moisture is available for

the complete leaching of most sandy soils, such as Thurman and Valentine soils. Surface flow of water as a result of heavy rainfall continuously detaches, mixes, transports, and redeposits unconsolidated material of all kinds. Excessive rainfall or rapid snowmelt resulting from above-normal spring temperatures can cause flooding and some additional deposition on bottom-land soils, such as Aowa and Inavale soils. Water table levels are higher in such soils as Orwet and Kezan soils during periods of above-normal precipitation. During periods of below-normal precipitation, the average water table levels are proportionately lower.

The average depth of frost penetration in the winter is about 42 inches, but it varies depending on the depth of subsoil moisture, the amount of snow cover, and the temperature. Frost action aids in the formation of a granular surface layer and prismatic or blocky structure in the subsoil.

Wind influences the distribution of the sandy eolian material and loess. The extensive deposits of loess and sand in the county are an example of the importance of wind as a soil-forming agent. The rolling topography in areas of Crofton, Moody, and Nora soils and the hummocky topography in areas of Thurman and Valentine soils can be attributed to wind action.

Plants and Animals

After the parent material was deposited, bacteria, fungi, lichens, and other single forms of plant and animal life invaded the parent material. After a time, grasses and other plants began to grow. Once vegetation is established, many kinds of animals and organisms inhabit the soil material and make use of the food provided by the plants. Plants and animals live on or in the soil and influence its physical and chemical properties through the organic matter they provide.

The soils in Knox County formed mostly under mid and tall grasses. The fibrous root system of these grasses fills the surface layer with minute rootlets, which decay and contribute organic matter and promote development of a granular structure. Deeper roots improve the permeability in the subsoil and add a small amount of organic matter. They also contribute to the fracture and weathering of bedrock in such soils as the Labu, Lynch, and Redstoe soils. Plants help to keep the soil porous, improve the movement of air and water, and protect the surface from erosion.

As plants decay, micro-organisms act on the organic matter and decompose it into humus and other mineral nutrients that are available to living plants. Some bacteria remove nitrogen from the air and use it for their own growth. When these bacteria die, the nitrogen becomes available to plants. Earthworms mix the soil

material, improve granulation, and increase the availability of plant nutrients. Insects and small burrowing animals also mix the soil material and improve soil aeration and drainage.

Human activities also affect soil formation. Cultivation in sloping areas accelerates the loss of soil; however, conservation tillage and terraces can help to control excessive erosion. Large dams prevent flooding and the deposition of sediments on bottom-land soils, such as Blyburg soils.

Relief

Relief, or lay of the land, is a very important factor in the formation of soils in the county. The degree, shape, and length of slopes determine the rate of runoff and the moisture content of the soils. Generally, as the degree of slope increases, the runoff rate and degree of erosion also increase and the amount of moisture absorbed by the soil and the degree of soil development decrease. Strongly sloping to very steep soils, such as Betts, Crofton, and Lynch soils, have a thin surface layer, an accumulation of lime higher in the profile, and a weakly developed subsoil. Nora soils, which are on gentle side slopes, have been leached of lime in the upper part of the subsoil. Moody soils, which are on very gentle slopes, have been leached of lime to a greater depth. Fillmore and Scott soils, which are in upland depressions, receive extra moisture from runoff and have developed a claypan in the subsoil.

Undulating, sandy soils, such as Valentine and Thurman soils, typically have a thinner surface soil where they occur on the upper part of hummocks than where they occur on the lower part. This characteristic is mainly the result of soil blowing, which is more severe on the higher parts of the landscape.

Some small, alkaline areas have developed in the county. These areas are on the lower slopes where seepage occurs. They have a perched high water table. Some bottom-land soils, such as Barney and Kezan soils, have a high water table. Generally, these soils are in the lower positions on bottom land or along the upper part of drainageways where the channel is only slightly entrenched. Bottom-land soils that are occasionally or frequently flooded, such as Aowa and Inavale soils, receive additional deposits of sediments because of their position on the flood plain.

Time

Time is needed for the formation of soils. Soils that have been in place only a short time show little or no horizon development. Soils that have been in place for a long time have well developed horizons.

Soils that formed in residuum develop more slowly

than soils that formed in unconsolidated parent material. The weathering of bedrock and soil formation take place at the same time, but the process is very slow. Bristow, Brunswick, Gavins, Labu, Lynch, Mariaville, Redstoe, Sansarc, and Verdigre soils formed in residuum derived from chalkrock, shale, sandstone, or siltstone.

In the transported, unconsolidated parent materials, such as glacial till, loess, sand, and alluvium, soil formation began as soon as the land surface was stabilized. The soils on uplands and stream terraces represent a wide range in time and degree of development. On moderately steep to very steep slopes, water erosion and soil blowing can remove part of the surface layer and slow the process of soil formation. Betts, Crofton, and Valentine soils are

examples of young upland soils that have a thin surface soil because erosion occurred at nearly the same rate as soil development. Loretto and Moody soils are mature and formed on stable land surfaces. They have a thick, dark, and granular surface soil. They have a well developed subsoil and have been leached of lime to a depth of 3 to 5 feet.

The youngest soils in the county formed in alluvium on bottom land. These soils continue to receive additional deposits of sediments from floodwater. Frequently flooded soils, such as Aowa and Inavale soils, have a light colored, stratified surface layer. Soils that are subject to rare or occasional flooding, such as Shell soils, have a thicker, dark surface soil.

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Glossary

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

AC soil. A soil having only an A and a C horizon.

Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

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

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

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

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

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind.

A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

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

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

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles

(flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

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

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

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

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; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, 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.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly

have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salt (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

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

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is

an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

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

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting

runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Increasesers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and are less palatable to livestock.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-

growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by the wind.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded 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 of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15

millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Organic matter content. The amount of organic matter in soil material. The classes used in this survey are very low, less than 0.5 percent; low, 0.5 to 1.0 percent; moderately low, 1.0 to 2.0 percent; moderate, 2.0 to 4.0 percent; and high, 4.0 to 8.0 percent.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

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

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

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

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

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

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

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine

sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level.....	0 to 1 percent
Very gently sloping.....	1 to 3 percent
Gently sloping.....	2 to 6 percent
Strongly sloping.....	6 to 11 percent
Moderately steep.....	11 to 15 percent
Steep.....	15 to 30 percent
Very steep.....	30 to 60 percent

Classes for complex slopes are as follows:

Nearly level.....	0 to 2 percent
Very gently sloping.....	1 to 3 percent
Gently sloping.....	2 to 6 percent
Strongly sloping.....	6 to 11 percent
Moderately steep.....	9 to 24 percent
Steep.....	15 to 30 percent
Very steep.....	30 to 60 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand.....	2.0 to 1.0
Coarse sand.....	1.0 to 0.5
Medium sand.....	0.5 to 0.25
Fine sand.....	0.25 to 0.10
Very fine sand.....	0.10 to 0.05
Silt.....	0.05 to 0.002
Clay.....	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and

clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in

general, than the alluvial plain or stream terrace; land above the lowlands along streams.

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

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

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

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION
(Recorded in the period 1951-87 at Niobrara, Nebraska)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
<u>° F</u>	<u>° F</u>	<u>° F</u>	<u>° F</u>	<u>° F</u>	<u>° F</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>	<u>In</u>	
January-----	29.9	7.8	18.9	59	-25	0	0.35	0.05	0.55	1	4.7
February-----	37.0	15.0	26.0	68	-19	10	.55	.06	.85	2	4.8
March-----	46.0	24.0	35.0	79	-6	39	1.46	.35	2.31	4	7.9
April-----	62.7	36.8	49.8	91	17	110	2.25	.86	3.38	5	1.0
May-----	73.8	47.8	60.8	94	26	344	3.40	1.67	4.92	7	.0
June-----	83.7	57.6	70.7	102	40	621	3.93	2.03	5.58	6	.0
July-----	89.3	63.2	76.3	105	47	815	3.23	1.48	4.72	5	.0
August-----	87.3	61.1	74.2	102	44	750	2.45	1.11	3.58	5	.0
September---	77.8	50.7	64.3	98	29	429	2.31	1.14	3.32	5	.0
October-----	66.1	38.6	52.4	89	19	158	1.45	.32	2.35	3	.3
November----	47.3	25.3	36.3	75	-1	14	.87	.13	1.44	2	3.5
December----	34.9	13.9	24.4	63	-16	0	.51	.11	.82	2	6.6
Yearly:											
Average---	61.3	36.8	49.1	---	---	---	---	---	---	---	---
Extreme---	---	---	---	105	-26	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,290	22.76	17.89	27.09	47	28.8

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL
(Recorded in the period 1951-81 at Niobrara, Nebraska)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 28	May 13	May 20
2 years in 10 later than--	Apr. 23	May 6	May 16
5 years in 10 later than--	Apr. 12	Apr. 25	May 7
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 12	Sept. 28	Sept. 16
2 years in 10 earlier than--	Oct. 17	Oct. 2	Sept. 22
5 years in 10 earlier than--	Oct. 26	Oct. 12	Oct. 3

TABLE 3.--GROWING SEASON
(Recorded in the period 1951-81 at Niobrara, Nebraska)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
9 years in 10	175	148	127
8 years in 10	183	155	134
5 years in 10	196	169	149
2 years in 10	210	183	163
1 year in 10	217	190	170

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

Map symbol	Soil name	Acres	Percent
Aa	Albaton silty clay, 0 to 2 percent slopes-----	1,120	0.2
Ab	Albaton silty clay, ponded, 0 to 1 percent slopes-----	410	0.1
AcC	Alcester silt loam, 2 to 6 percent slopes-----	32,540	4.5
AcD	Alcester silt loam, 6 to 11 percent slopes-----	600	0.1
Ao	Aowa silt loam, 0 to 2 percent slopes-----	9,000	1.2
Ar	Aowa silt loam, channeled, 0 to 2 percent slopes-----	10,240	1.4
Ba	Barney loam, 0 to 2 percent slopes-----	2,980	0.4
Bd	Bazile loamy fine sand, 0 to 2 percent slopes-----	1,310	0.2
BdC	Bazile loamy fine sand, 2 to 6 percent slopes-----	4,670	0.6
BdD	Bazile loamy fine sand, 6 to 11 percent slopes-----	400	0.1
Bn	Bazile loam, 0 to 2 percent slopes-----	5,950	0.8
BnC	Bazile loam, 2 to 6 percent slopes-----	31,500	4.3
BnD	Bazile loam, 6 to 11 percent slopes-----	7,990	1.1
BoD2	Betts clay loam, 6 to 11 percent slopes, eroded-----	4,850	0.7
BoE2	Betts clay loam, 11 to 15 percent slopes, eroded-----	5,910	0.8
BoF	Betts clay loam, 15 to 30 percent slopes-----	9,960	1.4
BoG	Betts clay loam, 30 to 60 percent slopes-----	840	0.1
Bp	Blendon fine sandy loam, 0 to 2 percent slopes-----	4,410	0.6
Br	Blyburg silt loam, 0 to 2 percent slopes-----	430	0.1
Bs	Boel loamy fine sand, 0 to 2 percent slopes-----	1,400	0.2
Bt	Boelus loamy sand, 0 to 2 percent slopes-----	340	*
BtC	Boelus loamy sand, 2 to 6 percent slopes-----	2,150	0.3
BtD	Boelus loamy sand, 6 to 11 percent slopes-----	760	0.1
BvG	Bristow silty clay, 30 to 60 percent slopes-----	4,700	0.6
BwD	Brunswick fine sandy loam, 6 to 11 percent slopes-----	1,760	0.2
BxE	Brunswick-Paka complex, 6 to 15 percent slopes-----	6,680	0.9
BxF	Brunswick-Paka complex, 15 to 30 percent slopes-----	24,130	3.3
By	Butler silt loam, 0 to 2 percent slopes-----	350	*
Co	Coleridge silt loam, 0 to 2 percent slopes-----	5,450	0.7
CrC2	Crofton silt loam, 2 to 6 percent slopes, eroded-----	3,210	0.4
CrD2	Crofton silt loam, 6 to 11 percent slopes, eroded-----	2,670	0.4
CrE2	Crofton silt loam, 11 to 15 percent slopes, eroded-----	23,700	3.3
CrF	Crofton silt loam, 15 to 30 percent slopes-----	26,210	3.6
CrG	Crofton silt loam, 30 to 60 percent slopes-----	1,230	0.2
CsC2	Crofton-Nora complex, 2 to 6 percent slopes, eroded-----	13,940	1.9
CsD2	Crofton-Nora complex, 6 to 11 percent slopes, eroded-----	68,905	9.5
CsE2	Crofton-Nora complex, 11 to 15 percent slopes, eroded-----	12,810	1.8
CtD2	Crofton-Thurman complex, 6 to 11 percent slopes, eroded-----	4,280	0.6
CtE2	Crofton-Thurman complex, 11 to 15 percent slopes, eroded-----	1,050	0.1
CtF	Crofton-Thurman complex, 15 to 30 percent slopes-----	5,380	0.7
Ef	Elsmere loamy fine sand, 0 to 2 percent slopes-----	180	*
Eh	Elsmere fine sandy loam, 0 to 2 percent slopes-----	1,120	0.2
Et	Eltree silt loam, 0 to 2 percent slopes-----	1,080	0.1
EtC	Eltree silt loam, 2 to 6 percent slopes-----	660	0.1
Fm	Fillmore silt loam, 0 to 1 percent slopes-----	470	0.1
Fu	Fluvaquents, silty, 0 to 2 percent slopes-----	5,290	0.7
GaG	Gavins silt loam, 30 to 60 percent slopes-----	2,080	0.3
Gf	Gibbon silt loam, 0 to 2 percent slopes-----	2,720	0.4
Hd	Hobbs silt loam, 0 to 2 percent slopes-----	3,070	0.4
Ho	Hord silt loam, 0 to 2 percent slopes-----	2,660	0.4
If	Inavale fine sand, 0 to 2 percent slopes-----	880	0.1
Ig	Inavale fine sand, channeled, 0 to 2 percent slopes-----	6,750	0.9
Ih	Inavale loamy fine sand, 0 to 2 percent slopes-----	2,060	0.3
Im	Inavale fine sandy loam, 0 to 2 percent slopes-----	2,620	0.4
Ke	Kezan silt loam, 0 to 2 percent slopes-----	8,550	1.2
KzB	Kezan silt loam, channeled, 0 to 2 percent slopes-----	570	0.1
LbD	Labu silty clay, 6 to 11 percent slopes-----	17,600	2.4
LcF	Labu-Sansarc complex, 11 to 30 percent slopes-----	38,530	5.3
LhC2	Longford silty clay loam, 2 to 6 percent slopes, eroded-----	220	*
LhD2	Longford silty clay loam, 6 to 11 percent slopes, eroded-----	210	*
Lk	Loretto fine sandy loam, 0 to 2 percent slopes-----	750	0.1
LkC	Loretto fine sandy loam, 2 to 6 percent slopes-----	1,860	0.3

See footnote at end of table.

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

Map symbol	Soil name	Acres	Percent
LyF	Lynch-Bristow complex, 11 to 30 percent slopes-----	13,580	1.9
LzD	Lynch-Verdel complex, 6 to 11 percent slopes-----	9,640	1.3
MbF	Mariaville very fine sandy loam, 3 to 30 percent slopes-----	770	0.1
MeB	Meadin sandy loam, 0 to 3 percent slopes-----	150	*
MgF	Meadin-O'Neill complex, 3 to 30 percent slopes-----	9,550	1.3
Mm	Moody loam, 0 to 2 percent slopes-----	6,190	0.8
MmC	Moody loam, 2 to 6 percent slopes-----	19,450	2.7
Mo	Moody silty clay loam, 0 to 2 percent slopes-----	3,420	0.5
MoC	Moody silty clay loam, 2 to 6 percent slopes-----	22,510	3.1
NoC	Nora silty clay loam, 2 to 6 percent slopes-----	9,140	1.3
NoD	Nora silty clay loam, 6 to 11 percent slopes-----	4,740	0.7
NoE	Nora silty clay loam, 11 to 15 percent slopes-----	200	*
Ob	Obert silt loam, wet, 0 to 2 percent slopes-----	2,990	0.4
Od	Onawa silty clay, 0 to 2 percent slopes-----	550	0.1
Oe	O'Neill sandy loam, 0 to 2 percent slopes-----	250	*
OeC	O'Neill sandy loam, 2 to 6 percent slopes-----	930	0.1
Og	Ord fine sandy loam, 0 to 2 percent slopes-----	720	0.1
Oh	Ord loam, 0 to 2 percent slopes-----	1,080	0.1
Or	Ortello fine sandy loam, 0 to 2 percent slopes-----	1,810	0.2
OrC	Ortello fine sandy loam, 2 to 6 percent slopes-----	6,150	0.8
Ou	Orwet loam, 0 to 2 percent slopes-----	2,040	0.3
Ph	Paka loam, 0 to 2 percent slopes-----	1,080	0.1
PhC	Paka loam, 2 to 6 percent slopes-----	2,320	0.3
PhD	Paka loam, 6 to 11 percent slopes-----	1,700	0.2
PhE	Paka loam, 11 to 15 percent slopes-----	2,970	0.4
Pt	Percival silty clay, 0 to 2 percent slopes-----	420	0.1
RdD	Redstoe silt loam, 6 to 11 percent slopes-----	910	0.1
RgF	Redstoe-Gavins complex, 11 to 30 percent slopes-----	1,400	0.2
SaG	Sansarc silty clay, 30 to 60 percent slopes-----	880	0.1
Sc	Scott silt loam, 0 to 1 percent slopes-----	260	*
Sh	Shell silt loam, 0 to 2 percent slopes-----	9,920	1.4
SsF2	Simeon sand, 6 to 30 percent slopes, eroded-----	9,930	1.4
StC	Simeon loamy sand, 0 to 6 percent slopes-----	2,380	0.3
SuC	Simeon sandy loam, 0 to 6 percent slopes-----	2,560	0.4
SvF	Simeon-Thurman complex, 6 to 30 percent slopes-----	6,900	0.9
Sw	Solomon silty clay, 0 to 2 percent slopes-----	790	0.1
TfB	Thurman fine sand, 0 to 3 percent slopes-----	1,180	0.2
TfC	Thurman fine sand, 3 to 6 percent slopes-----	6,260	0.9
ThB	Thurman loamy fine sand, 0 to 3 percent slopes-----	2,590	0.4
ThC	Thurman loamy fine sand, 3 to 6 percent slopes-----	5,400	0.7
ToB	Thurman fine sandy loam, 0 to 3 percent slopes-----	3,630	0.5
ToD	Thurman fine sandy loam, 3 to 11 percent slopes-----	30,710	4.2
ToF	Thurman fine sandy loam, 11 to 30 percent slopes-----	6,120	0.8
Tr	Trent silt loam, 0 to 2 percent slopes-----	20,690	2.8
Tx	Trent silt loam, moderately wet, 0 to 2 percent slopes-----	1,440	0.2
Ubf	Urban land, 3 to 30 percent slopes-----	280	*
VaD	Valentine fine sand, 3 to 9 percent slopes-----	5,190	0.7
VaE	Valentine fine sand, 9 to 24 percent slopes-----	1,730	0.2
Ve	Verdel silty clay, 0 to 2 percent slopes-----	1,470	0.2
VeC	Verdel silty clay, 2 to 6 percent slopes-----	3,970	0.5
VeD	Verdel silty clay, 6 to 11 percent slopes-----	530	0.1
VfC	Verdigre fine sandy loam, 2 to 6 percent slopes-----	1,300	0.2
VfD	Verdigre fine sandy loam, 6 to 11 percent slopes-----	710	0.1
VfF	Verdigre fine sandy loam, 11 to 30 percent slopes-----	1,860	0.3
VgC	Verdigre loam, 2 to 6 percent slopes-----	1,330	0.2
VgD	Verdigre loam, 6 to 11 percent slopes-----	3,460	0.5
VgF	Verdigre loam, 11 to 30 percent slopes-----	1,220	0.2
	Water, undifferentiated-----	21,184	3.0
	Total-----	728,679	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

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

Map symbol	Soil name
AcC	Alcester silt loam, 2 to 6 percent slopes
Ao	Aowa silt loam, 0 to 2 percent slopes
Bn	Bazile loam, 0 to 2 percent slopes
BnC	Bazile loam, 2 to 6 percent slopes
Bp	Blendon fine sandy loam, 0 to 2 percent slopes
Br	Blyburg silt loam, 0 to 2 percent slopes
By	Butler silt loam, 0 to 2 percent slopes (where drained)
Co	Coleridge silt loam, 0 to 2 percent slopes (where drained)
CrC2	Crofton silt loam, 2 to 6 percent slopes, eroded
CsC2	Crofton-Nora complex, 2 to 6 percent slopes, eroded
Et	Eltree silt loam, 0 to 2 percent slopes
EtC	Eltree silt loam, 2 to 6 percent slopes
Gf	Gibbon silt loam, 0 to 2 percent slopes (where drained)
Hd	Hobbs silt loam, 0 to 2 percent slopes
Ho	Hord silt loam, 0 to 2 percent slopes
LhC2	Longford silty clay loam, 2 to 6 percent slopes, eroded
Lk	Loretto fine sandy loam, 0 to 2 percent slopes
LkC	Loretto fine sandy loam, 2 to 6 percent slopes
Mm	Moody loam, 0 to 2 percent slopes
MmC	Moody loam, 2 to 6 percent slopes
Mo	Moody silty clay loam, 0 to 2 percent slopes
MoC	Moody silty clay loam, 2 to 6 percent slopes
NoC	Nora silty clay loam, 2 to 6 percent slopes
Od	Onawa silty clay, 0 to 2 percent slopes (where drained)
Og	Ord fine sandy loam, 0 to 2 percent slopes (where drained)
Oh	Ord loam, 0 to 2 percent slopes (where drained)
Or	Ortello fine sandy loam, 0 to 2 percent slopes
OrC	Ortello fine sandy loam, 2 to 6 percent slopes
Ph	Paka loam, 0 to 2 percent slopes
PhC	Paka loam, 2 to 6 percent slopes
Pt	Percival silty clay, 0 to 2 percent slopes (where drained)
Sh	Shell silt loam, 0 to 2 percent slopes
Sw	Solomon silty clay, 0 to 2 percent slopes (where drained)
ToB	Thurman fine sandy loam, 0 to 3 percent slopes
Tr	Trent silt loam, 0 to 2 percent slopes
Tx	Trent silt loam, moderately wet, 0 to 2 percent slopes
Ve	Verdel silty clay, 0 to 2 percent slopes
VeC	Verdel silty clay, 2 to 6 percent slopes
VfC	Verdigre fine sandy loam, 2 to 6 percent slopes
VgC	Verdigre loam, 2 to 6 percent slopes

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

(Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability		Corn		Smooth brome grass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
Aa----- Albaton	IIIw	IIIw	65	100	4.0	---	3.0	4.0	35	---	25	35
Ab----- Albaton	Vw	---	---	---	---	---	---	---	---	---	---	---
AcC----- Alcester	IIE	IIIe	80	150	4.0	---	3.5	6.0	70	---	35	45
AcD----- Alcester	IIIe	IVe	75	145	3.8	---	3.2	5.5	65	---	28	38
Ao----- Aowa	IIw	IIw	80	140	4.5	---	4.0	5.5	55	---	35	45
Ar----- Aowa	VIw	---	---	---	---	---	---	---	---	---	---	---
Ba----- Barney	Vw	---	---	---	---	---	---	---	---	---	---	---
Bd----- Bazile	IIIe	IIE	55	150	3.4	---	2.6	5.5	54	---	26	42
BdC----- Bazile	IIIe	IIIe	50	145	3.2	---	2.4	5.2	48	---	24	40
BdD----- Bazile	IVe	IVe	45	130	3.0	---	2.2	5.0	45	---	20	35
Bn----- Bazile	IIS	I	60	150	3.5	---	2.7	5.5	60	---	28	45
BnC----- Bazile	IIIe	IIIe	55	145	3.3	---	2.5	5.2	55	---	26	42
BnD----- Bazile	IVe	IVe	50	130	3.1	---	2.3	5.0	50	---	23	35
BoD2----- Betts	IVe	IVe	50	120	2.5	---	2.4	4.5	50	---	20	35
BoE2----- Betts	IVe	---	45	---	2.3	---	2.2	---	45	---	16	---
BoF----- Betts	VIe	---	---	---	---	---	---	---	---	---	---	---
BoG----- Betts	VIIe	---	---	---	---	---	---	---	---	---	---	---
Bp----- Blendon	IIE	IIE	60	150	4.0	---	3.0	6.0	55	---	28	45
Br----- Blyburg	I	I	80	155	5.0	---	6.0	7.0	70	---	40	50

See footnote at end of table.

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

Soil name and map symbol	Land capability		Corn		Smooth brome grass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
Bs----- Boel	IVw	IVw	45	135	3.5	---	4.0	5.5	40	---	25	40
Bt----- Boelus	IIIe	IIIe	60	150	3.5	---	3.0	6.0	54	---	28	44
BtC----- Boelus	IIIe	IIIe	55	145	3.3	---	2.7	5.5	50	---	26	40
BtD----- Boelus	IVe	IVe	50	130	3.1	---	2.5	5.0	47	---	22	35
BvG----- Bristow	VIIIs	---	---	---	---	---	---	---	---	---	---	---
BwD----- Brunswick	IVe	IVe	40	130	2.0	---	2.5	5.0	45	---	20	35
BxE----- Brunswick-Paka	IVe	---	40	---	1.8	---	2.4	---	43	---	18	---
BxF----- Brunswick-Paka	VIIe	---	---	---	---	---	---	---	---	---	---	---
By----- Butler	IIw	IIw	55	130	3.0	---	3.0	5.5	55	---	26	35
Co----- Coleridge	IIw	IIw	85	140	4.0	---	5.0	5.7	55	---	40	45
CrC2----- Crofton	IIIe	IIIe	62	140	2.8	---	2.5	5.5	54	---	25	40
CrD2----- Crofton	IVe	IVe	60	130	2.8	---	2.5	5.0	48	---	20	35
CrE2----- Crofton	IVe	---	55	---	2.5	---	2.3	---	44	---	16	---
CrF----- Crofton	VIIe	---	---	---	---	---	---	---	---	---	---	---
CrG----- Crofton	VIIe	---	---	---	---	---	---	---	---	---	---	---
CsC2----- Crofton-Nora	IIIe	IIIe	70	145	3.0	---	3.0	5.7	58	---	28	40
CsD2----- Crofton-Nora	IVe	IVe	65	130	2.8	---	2.7	5.2	53	---	24	35
CsE2----- Crofton-Nora	IVe	---	60	---	2.6	---	2.5	---	46	---	17	---
CtD2----- Crofton-Thurman	IVe	IVe	50	130	2.7	---	2.4	5.0	50	---	20	35
CtE2: Crofton-----	IVe	---	45	---	2.5	---	2.2	---	43	---	15	---
Thurman-----	VIIe	---	45	---	2.5	---	2.2	---	43	---	15	---

See footnote at end of table.

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

Soil name and map symbol	Land capability		Corn		Smooth bromegrass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
CtF----- Crofton-Thurman	Vie	---	---	---	---	---	---	---	---	---	---	---
Ef----- Elsmere	IIIw	IIIw	50	135	3.5	---	4.0	5.0	38	---	24	40
Eh----- Elsmere	IIw	IIw	60	135	3.7	---	4.5	5.5	47	---	28	40
Et----- Eltree	I	I	80	155	4.0	---	3.5	6.5	70	---	40	50
EtC----- Eltree	IIe	IIIe	75	150	3.5	---	3.3	6.3	65	---	35	45
Fm----- Fillmore	IIIw	IVw	35	100	3.5	---	1.6	3.5	32	---	18	30
Fu----- Fluvaquents	VIIIw	---	---	---	---	---	---	---	---	---	---	---
GaG----- Gavins	VIIIs	---	---	---	---	---	---	---	---	---	---	---
Gf----- Gibbon	IIw	IIw	85	140	4.0	---	5.0	5.8	50	---	40	45
Hd----- Hobbs	IIw	IIw	80	140	4.5	---	4.0	5.5	55	---	35	45
Ho----- Hord	I	I	85	155	4.0	---	3.5	6.5	70	---	40	50
If----- Inavale	Vie	IVe	---	100	---	---	---	3.5	---	---	---	---
Ig----- Inavale	VIw	---	---	---	---	---	---	---	---	---	---	---
Ih----- Inavale	IVe	IIIe	35	130	2.0	---	3.0	5.0	40	---	18	35
Im----- Inavale	IIIe	IIIe	45	135	2.4	---	3.5	5.5	45	---	24	40
Ke----- Kezan	IVw	---	50	---	4.0	---	---	---	---	---	35	---
KzB----- Kezan	VIw	---	---	---	---	---	---	---	---	---	---	---
LbD----- Labu	IVe	IVe	37	110	2.2	---	1.8	5.0	40	---	16	25
LcF: Labu-----	Vie	---	---	---	---	---	---	---	---	---	---	---
Sansarc-----	VIs	---	---	---	---	---	---	---	---	---	---	---
LhC2----- Longford	IIIe	IIIe	50	120	2.4	---	2.4	5.5	50	---	24	35

See footnote at end of table.

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

Soil name and map symbol	Land capability		Corn		Smooth bromegrass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
LhD2----- Longford	IVe	IVe	40	115	2.2	---	2.0	5.0	45	---	18	30
Lk----- Loretto	IIE	IIE	75	155	3.3	---	3.0	6.5	60	---	35	50
LkC----- Loretto	IIIE	IIIE	70	150	3.1	---	2.8	6.0	55	---	32	45
LyF: Lynch----- Bristow-----	VIE VIS	---	---	---	---	---	---	---	---	---	---	---
LzD----- Lynch-Verdel	IVe	IVe	32	110	2.0	---	1.5	4.0	30	---	15	25
MbF----- Mariaville	VIS	---	---	---	---	---	---	---	---	---	---	---
MeB----- Meadin	IVs	IVs	20	100	---	---	0.8	2.5	25	---	10	20
MgF: Meadin----- O'Neill-----	VIS VIE	---	---	---	---	---	---	---	---	---	---	---
Mm----- Moody	I	I	75	155	3.5	---	2.8	6.5	70	---	34	50
MmC----- Moody	IIE	IIIE	70	150	3.3	---	2.7	6.0	65	---	30	45
Mo----- Moody	I	I	80	150	3.7	---	3.0	6.5	70	---	35	50
MoC----- Moody	IIE	IIIE	75	145	3.5	---	2.8	6.0	65	---	32	45
NoC----- Nora	IIE	IIIE	75	145	3.6	---	2.8	6.0	65	---	31	45
NoD----- Nora	IIIE	IVe	68	130	3.2	---	2.6	5.5	58	---	25	35
NoE----- Nora	IVe	---	60	---	3.0	---	2.3	---	48	---	18	---
Ob----- Obert	Vw	---	---	---	---	---	---	---	---	---	---	---
Od----- Onawa	IIw	IIw	70	130	4.0	---	6.0	7.0	55	---	28	42
Oe----- O'Neill	IIIE	IIIE	35	145	1.5	---	1.5	5.0	32	---	17	38
OeC----- O'Neill	IVe	IVe	30	135	1.3	---	1.3	4.5	28	---	15	33
Og----- Ord	IIw	IIw	65	135	3.3	---	5.0	6.0	50	---	30	45

See footnote at end of table.

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

Soil name and map symbol	Land capability		Corn		Smooth brome grass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
Oh----- Ord	IIw	IIw	70	140	3.5	---	5.0	6.0	53	---	32	45
Or----- Ortello	IIe	IIe	55	150	3.0	---	3.0	6.0	50	---	27	45
OrC----- Ortello	IIIe	IIIe	50	145	2.8	---	2.7	5.5	46	---	25	40
Ou----- Orwet	IVw	---	50	---	4.0	---	---	---	---	---	24	---
Ph----- Paka	I	I	70	145	3.3	---	2.7	6.0	60	---	30	45
PhC----- Paka	IIe	IIIe	62	140	3.1	---	2.5	5.5	54	---	28	40
PhD----- Paka	IIIe	IVe	54	130	3.0	---	2.3	5.0	50	---	23	35
PhE----- Paka	IVe	---	45	---	2.5	---	2.0	---	44	---	15	---
Pt----- Percival	IIw	IIw	50	120	3.8	---	3.5	5.5	45	---	25	40
RdD----- Redstoe	IVe	IVe	40	120	2.0	---	1.6	4.5	45	---	17	25
RgF: Redstoe----- Gavins-----	VIe VIS	---	---	---	---	---	---	---	---	---	---	---
SaG----- Sansarc	VIIIs	---	---	---	---	---	---	---	---	---	---	---
Sc----- Scott	IVw	---	20	---	3.0	---	1.0	---	---	---	10	---
Sh----- Shell	IIw	IIw	85	155	4.5	---	4.0	6.5	70	---	40	50
SsF2----- Simeon	VIS	---	---	---	---	---	---	---	---	---	---	---
StC----- Simeon	IVe	IVe	25	120	2.0	---	1.2	4.0	30	---	14	30
SuC----- Simeon	IVe	IVe	28	130	2.2	---	1.4	4.5	32	---	16	35
SvF: Simeon----- Thurman-----	VIS VIe	---	---	---	---	---	---	---	---	---	---	---
Sw----- Solomon	IIIw	IIIw	65	120	4.0	---	6.0	7.0	48	---	25	38
TfB----- Thurman	IVe	IVe	32	140	2.2	---	2.2	4.2	35	---	17	35

See footnote at end of table.

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

Soil name and map symbol	Land capability		Corn		Smooth bromegrass		Alfalfa hay		Oats		Soybeans	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	AUM*	AUM*	Tons	Tons	Bu	Bu	Bu	Bu
TfC----- Thurman	IVe	IVe	30	135	2.0	---	2.0	4.0	30	---	14	32
ThB----- Thurman	IIIe	IIIe	38	145	2.5	---	2.4	5.5	40	---	20	38
ThC----- Thurman	IVe	IVe	35	140	2.3	---	2.1	5.0	35	---	18	35
ToB----- Thurman	IIIe	IIIe	42	145	2.6	---	2.5	5.5	42	---	25	40
ToD----- Thurman	IVe	IVe	35	130	2.4	---	2.2	5.0	38	---	20	35
ToF----- Thurman	VIE	---	---	---	---	---	---	---	---	---	---	---
Tr----- Trent	I	I	85	155	4.5	---	4.0	6.5	70	---	40	50
Tx----- Trent	I	I	85	140	5.0	---	5.0	6.0	63	---	40	45
UbF. Urban land												
VaD----- Valentine	VIE	IVe	---	110	---	---	---	3.5	---	---	---	20
VaE----- Valentine	VIE	---	---	---	---	---	---	---	---	---	---	---
Ve----- Verdel	IIs	IIs	50	130	2.7	---	3.2	5.5	50	---	32	40
VeC----- Verdel	IIIe	IIIe	45	120	2.5	---	2.7	5.3	45	---	26	37
VeD----- Verdel	IVe	IVe	40	110	2.2	---	2.2	5.0	35	---	18	30
VfC----- Verdigre	IIIe	IIIe	50	125	2.5	---	2.6	5.5	48	---	25	40
VfD----- Verdigre	IVe	IVe	45	115	2.3	---	2.4	5.0	44	---	21	35
VfF----- Verdigre	VIE	---	---	---	---	---	---	---	---	---	---	---
VgC----- Verdigre	IIIe	IIIe	55	125	2.6	---	2.8	5.5	55	---	27	40
VgD----- Verdigre	IVe	IVe	50	115	2.4	---	2.5	5.0	50	---	22	35
VgF----- Verdigre	VIE	---	---	---	---	---	---	---	---	---	---	---

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

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(All soils are assigned to nonirrigated capability subclasses (N). Only potentially irrigable soils are assigned to irrigated subclasses (I). Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e) Acres	Wetness (w) Acres	Soil problem (s) Acres
I (N)	36,990	---	---	---
I (I)	42,940	---	---	---
II (N)	135,410	93,590	34,400	7,420
II (I)	44,150	8,280	34,400	1,470
III (N)	90,170	88,080	2,090	---
III (I)	170,500	168,410	2,090	---
IV (N)	266,010	253,140	12,720	150
IV (I)	188,910	186,740	2,020	150
V (N)	6,380	---	6,380	---
VI (N)	156,770	82,466	27,520	46,784
VII (N)	9,730	2,070	---	7,660
VIII (N)	5,290	---	5,290	---

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

(Only the soils that support rangeland vegetation suitable for grazing are listed)

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Aa----- Albaton	Clayey Overflow-----	Favorable	3,200	Western wheatgrass-----	30
		Normal	2,700	Green needlegrass-----	25
		Unfavorable	2,200	Big bluestem-----	15
				Little bluestem-----	10
				Kentucky bluegrass-----	5
				Sedge-----	5
Blue grama-----	5				
Ab----- Albaton	Wetland-----	Favorable	6,000	Prairie cordgrass-----	40
		Normal	5,500	Slender wheatgrass-----	10
		Unfavorable	4,400	Plains bluegrass-----	10
				Sedge-----	10
AcC, AcD----- Alcester	Silty-----	Favorable	4,400	Big bluestem-----	35
		Normal	4,000	Little bluestem-----	15
		Unfavorable	2,800	Green needlegrass-----	10
				Western wheatgrass-----	10
				Needleandthread-----	10
				Sideoats grama-----	5
				Leadplant-----	5
				Sedge-----	5
Ao----- Aowa	Silty Overflow-----	Favorable	3,500	Big bluestem-----	30
		Normal	3,300	Little bluestem-----	15
		Unfavorable	3,000	Switchgrass-----	10
				Sideoats grama-----	10
				Indiangrass-----	5
				Porcupinegrass-----	5
				Western wheatgrass-----	5
				Sedge-----	5
Ar----- Aowa	Silty Overflow-----	Favorable	3,500	Big bluestem-----	25
		Normal	3,300	Little bluestem-----	15
		Unfavorable	3,000	Sideoats grama-----	15
				Switchgrass-----	5
				Indiangrass-----	5
				Porcupinegrass-----	5
				Western wheatgrass-----	5
Ba----- Barney	Wetland-----	Favorable	5,500	Prairie cordgrass-----	20
		Normal	5,200	Northern reedgrass-----	20
		Unfavorable	5,000	Bluejoint reedgrass-----	20
				Sedge-----	10
				Rush-----	10
				Plains bluegrass-----	5
Bd, BdC, BdD----- Bazile	Sandy-----	Favorable	3,500	Little bluestem-----	25
		Normal	2,700	Sand bluestem-----	15
		Unfavorable	2,000	Big bluestem-----	10
				Switchgrass-----	10
				Indiangrass-----	5
				Sideoats grama-----	5
				Blue grama-----	5
				Prairie dropseed-----	5
				Green needlegrass-----	5
				Porcupinegrass-----	5
				Sedge-----	5

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Bn, BnC, BnD----- Bazile	Silty-----	Favorable	3,700	Big bluestem-----	25
		Normal	3,200	Little bluestem-----	20
		Unfavorable	2,700	Indiangrass-----	5
			Switchgrass-----	5	
			Sideoats grama-----	5	
			Blue grama-----	5	
			Prairie dropseed-----	5	
			Green needlegrass-----	5	
			Porcupinegrass-----	5	
			Sedge-----	5	
Sand bluestem-----	5				
BoD2----- Betts	Limy Upland-----	Favorable	3,500	Little bluestem-----	40
		Normal	2,900	Needleandthread-----	15
		Unfavorable	2,000	Big bluestem-----	10
			Sideoats grama-----	10	
			Blue grama-----	5	
			Green needlegrass-----	5	
			Sedge-----	5	
			Leadplant-----	5	
BoE2, BoF, BoG----- Betts	Limy Upland-----	Favorable	3,100	Little bluestem-----	45
		Normal	2,600	Big bluestem-----	15
		Unfavorable	1,800	Needleandthread-----	10
			Sideoats grama-----	5	
			Blue grama-----	5	
			Green needlegrass-----	5	
			Sedge-----	5	
			Leadplant-----	5	
Bp----- Blendon	Sandy-----	Favorable	3,500	Little bluestem-----	25
		Normal	2,900	Prairie sandreed-----	20
		Unfavorable	2,000	Needleandthread-----	15
			Big bluestem-----	10	
			Blue grama-----	10	
			Porcupinegrass-----	5	
			Leadplant-----	5	
			Sedge-----	5	
			Sand bluestem-----	5	
Br----- Blyburg	Silty Lowland-----	Favorable	5,300	Big bluestem-----	35
		Normal	4,900	Little bluestem-----	10
		Unfavorable	4,500	Switchgrass-----	10
			Indiangrass-----	5	
			Porcupinegrass-----	5	
			Sideoats grama-----	5	
Sedge-----	5				
Kentucky bluegrass-----	5				
Bs----- Boel	Subirrigated-----	Favorable	5,200	Big bluestem-----	30
		Normal	4,900	Indiangrass-----	15
		Unfavorable	4,600	Little bluestem-----	10
			Switchgrass-----	10	
			Prairie cordgrass-----	10	
Sedge-----	5				
Bt, BtC, BtD----- Boelus	Sandy-----	Favorable	3,500	Little bluestem-----	20
		Normal	3,300	Needleandthread-----	20
		Unfavorable	3,000	Prairie sandreed-----	20
			Blue grama-----	10	
			Sand bluestem-----	5	

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
BvG----- Bristow	Shallow Limy-----	Favorable	2,300	Little bluestem-----	35
		Normal	2,000	Big bluestem-----	20
		Unfavorable	1,800	Sidecoats grama-----	10
				Green needlegrass-----	5
				Blue grama-----	5
				Sedge-----	5
Leadplant-----	5				
BwD----- Brunswick	Sandy-----	Favorable	3,000	Little bluestem-----	25
		Normal	2,600	Sand bluestem-----	15
		Unfavorable	2,200	Needleandthread-----	15
				Prairie sandreed-----	10
				Blue grama-----	8
				Sidecoats grama-----	5
Sedge-----	5				
BxE*, BxF*: Brunswick-----	Sandy-----	Favorable	3,000	Little bluestem-----	25
		Normal	2,600	Sand bluestem-----	15
		Unfavorable	2,200	Needleandthread-----	15
				Prairie sandreed-----	10
				Blue grama-----	8
				Sidecoats grama-----	5
Sedge-----	5				
Paka-----	Silty-----	Favorable	4,000	Little bluestem-----	25
		Normal	3,600	Big bluestem-----	20
		Unfavorable	3,300	Sidecoats grama-----	10
				Needleandthread-----	10
				Switchgrass-----	5
				Indiangrass-----	5
				Blue grama-----	5
				Western wheatgrass-----	5
Sedge-----	5				
By----- Butler	Clayey-----	Favorable	3,800	Big bluestem-----	25
		Normal	3,400	Western wheatgrass-----	25
		Unfavorable	3,000	Little bluestem-----	15
				Switchgrass-----	5
				Tall dropseed-----	5
				Sidecoats grama-----	5
Indiangrass-----	5				
Co----- Coleridge	Subirrigated-----	Favorable	5,500	Big bluestem-----	25
		Normal	4,900	Little bluestem-----	15
		Unfavorable	4,200	Switchgrass-----	10
				Indiangrass-----	10
				Sedge-----	10
				Sidecoats grama-----	10
				Western wheatgrass-----	5
Prairie cordgrass-----	5				
CrC2, CrD2, CrE2, CrF----- Crofton	Limy Upland-----	Favorable	3,300	Little bluestem-----	30
		Normal	3,000	Big bluestem-----	25
		Unfavorable	2,700	Sidecoats grama-----	10
				Blue grama-----	5
				Western wheatgrass-----	5
Sedge-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
CrG----- Crofton	Thin Loess-----	Favorable	2,800	Little bluestem-----	30
		Normal	2,600	Big bluestem-----	20
		Unfavorable	2,400	Sideoats grama-----	15
				Blue grama-----	5
				Sedge-----	5
				Plains muhly-----	5
CsC2*, CsD2*, CsE2*: Crofton-----	Limy Upland-----	Favorable	3,300	Little bluestem-----	30
		Normal	3,000	Big bluestem-----	25
		Unfavorable	2,700	Sideoats grama-----	10
				Blue grama-----	5
				Western wheatgrass-----	5
				Sedge-----	5
Nora-----	Silty-----	Favorable	4,000	Little bluestem-----	25
		Normal	3,600	Big bluestem-----	20
		Unfavorable	3,300	Sideoats grama-----	10
				Blue grama-----	10
				Western wheatgrass-----	10
				Sedge-----	5
				Switchgrass-----	5
CtD2*, CtE2*, CtF*: Crofton-----	Limy Upland-----	Favorable	3,300	Little bluestem-----	30
		Normal	3,000	Big bluestem-----	25
		Unfavorable	2,700	Sideoats grama-----	10
				Blue grama-----	5
				Western wheatgrass-----	5
				Sedge-----	5
Thurman-----	Sandy-----	Favorable	3,500	Sand bluestem-----	25
		Normal	3,300	Little bluestem-----	20
		Unfavorable	3,000	Prairie sandreed-----	15
				Needleandthread-----	15
				Blue grama-----	10
				Switchgrass-----	5
Ef, Eh----- Elsmere	Subirrigated-----	Favorable	5,500	Big bluestem-----	35
		Normal	5,300	Little bluestem-----	20
		Unfavorable	5,000	Indiangrass-----	10
				Switchgrass-----	5
				Prairie cordgrass-----	5
				Sedge-----	5
				Plains bluegrass-----	5
Et, EtC----- Eltree	Silty-----	Favorable	4,000	Big bluestem-----	20
		Normal	3,500	Little bluestem-----	20
		Unfavorable	2,500	Indiangrass-----	10
				Switchgrass-----	10
				Sideoats grama-----	10
				Western wheatgrass-----	5
				Porcupinegrass-----	5
				Blue grama-----	5
				Sedge-----	5

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Fm----- Fillmore	Clayey Overflow-----	Favorable	3,200	Big bluestem-----	20
		Normal	2,700	Western wheatgrass-----	20
		Unfavorable	2,200	Little bluestem-----	10
			Switchgrass-----	10	
			Blue grama-----	10	
			Indiangrass-----	5	
			Sedge-----	5	
Kentucky bluegrass-----	5				
GaG----- Gavins	Shallow Limy-----	Favorable	3,600	Little bluestem-----	40
		Normal	3,000	Needlegrass-----	15
		Unfavorable	2,100	Sidecoats grama-----	10
			Big bluestem-----	10	
			Prairie dropseed-----	5	
			Western wheatgrass-----	5	
			Blue grama-----	5	
			Sedge-----	5	
Gf----- Gibbon	Subirrigated-----	Favorable	6,300	Big bluestem-----	35
		Normal	5,900	Indiangrass-----	20
		Unfavorable	5,500	Little bluestem-----	15
			Switchgrass-----	10	
			Prairie cordgrass-----	5	
Hd----- Hobbs	Silty Overflow-----	Favorable	4,500	Big bluestem-----	30
		Normal	4,000	Western wheatgrass-----	20
		Unfavorable	3,800	Little bluestem-----	15
			Switchgrass-----	10	
			Sidecoats grama-----	5	
Sedge-----	5				
Ho----- Hord	Silty Lowland-----	Favorable	4,000	Big bluestem-----	20
		Normal	3,600	Little bluestem-----	20
		Unfavorable	3,300	Blue grama-----	10
			Western wheatgrass-----	10	
			Needleandthread-----	10	
			Sidecoats grama-----	5	
Buffalograss-----	5				
If----- Inavale	Sandy Lowland-----	Favorable	3,500	Sand bluestem-----	30
		Normal	3,000	Little bluestem-----	25
		Unfavorable	2,200	Prairie sandreed-----	20
			Switchgrass-----	15	
			Needleandthread-----	5	
Indiangrass-----	5				
Ig----- Inavale	Sandy Lowland-----	Favorable	3,300	Sand bluestem-----	30
		Normal	2,800	Little bluestem-----	25
		Unfavorable	2,200	Prairie sandreed-----	15
			Switchgrass-----	5	
			Needleandthread-----	5	
			Blue grama-----	5	
			Sand dropseed-----	5	
			Porcupinegrass-----	5	
Sedge-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Ih----- Inavale	Sandy Lowland-----	Favorable	3,500	Sand bluestem-----	30
		Normal	3,000	Little bluestem-----	25
		Unfavorable	2,200	Prairie sandreed-----	20
				Switchgrass-----	15
				Needleandthread-----	5
				Indiangrass-----	5
Im----- Inavale	Sandy Lowland-----	Favorable	3,200	Little bluestem-----	25
		Normal	2,900	Sand bluestem-----	20
		Unfavorable	2,600	Needleandthread-----	15
				Prairie sandreed-----	15
				Switchgrass-----	5
				Blue grama-----	5
				Sand dropseed-----	5
Ke, KzB----- Kezan	Wet Subirrigated-----	Favorable	5,200	Big bluestem-----	30
		Normal	4,900	Indiangrass-----	15
		Unfavorable	4,600	Switchgrass-----	10
				Prairie cordgrass-----	10
				Canada wildrye-----	5
				Sedge-----	5
LbD----- Labu	Clayey-----	Favorable	3,400	Big bluestem-----	25
		Normal	3,000	Little bluestem-----	15
		Unfavorable	2,600	Green needlegrass-----	15
				Sideoats grama-----	10
				Western wheatgrass-----	10
				Blue grama-----	5
				Kentucky bluegrass-----	5
Sedge-----	5				
LcF*: Labu-----	Clayey-----	Favorable	3,400	Big bluestem-----	25
		Normal	3,000	Little bluestem-----	15
		Unfavorable	2,600	Green needlegrass-----	15
				Sideoats grama-----	10
				Western wheatgrass-----	10
				Blue grama-----	5
				Kentucky bluegrass-----	5
Sedge-----	5				
Sansarc-----	Shallow Clay-----	Favorable	3,000	Little bluestem-----	25
		Normal	2,500	Western wheatgrass-----	15
		Unfavorable	1,800	Green needlegrass-----	15
				Big bluestem-----	15
				Sideoats grama-----	10
				Blue grama-----	5
Sedge-----	5				
LhC2, LhD2----- Longford	Clayey-----	Favorable	5,500	Big bluestem-----	25
		Normal	4,000	Little bluestem-----	20
		Unfavorable	3,000	Indiangrass-----	10
				Switchgrass-----	10
				Sideoats grama-----	5
				Tall dropseed-----	5
				Blue grama-----	5
				Western wheatgrass-----	5
				Leadplant-----	5
Missouri goldenrod-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Lk, LkC----- Loretto	Sandy-----	Favorable	3,500	Big bluestem-----	20
		Normal	3,300	Little bluestem-----	20
		Unfavorable	3,000	Indiangrass-----	10
			Switchgrass-----	10	
			Needleandthread-----	10	
			Sidecoats grama-----	5	
			Blue grama-----	5	
Prairie sandreed-----	5				
Western wheatgrass-----	5				
LyF*: Lynch-----	Limy Upland-----	Favorable	3,000	Big bluestem-----	25
		Normal	2,700	Little bluestem-----	15
		Unfavorable	2,400	Sidecoats grama-----	10
			Needleandthread-----	10	
			Green needlegrass-----	5	
			Switchgrass-----	5	
			Blue grama-----	5	
Sedge-----	5				
Western wheatgrass-----	5				
Bristow-----	Shallow Limy-----	Favorable	2,300	Little bluestem-----	35
		Normal	2,000	Big bluestem-----	20
		Unfavorable	1,800	Sidecoats grama-----	10
			Green needlegrass-----	5	
			Blue grama-----	5	
			Sedge-----	5	
			Leadplant-----	5	
LzD*: Lynch-----	Limy Upland-----	Favorable	3,000	Big bluestem-----	25
		Normal	2,700	Little bluestem-----	15
		Unfavorable	2,400	Sidecoats grama-----	10
			Needleandthread-----	10	
			Green needlegrass-----	5	
			Switchgrass-----	5	
			Blue grama-----	5	
Sedge-----	5				
Western wheatgrass-----	5				
Verdel-----	Clayey-----	Favorable	3,800	Big bluestem-----	25
		Normal	3,400	Western wheatgrass-----	25
		Unfavorable	3,000	Little bluestem-----	5
			Switchgrass-----	5	
			Sedge-----	5	
			Tall dropseed-----	5	
			Blue grama-----	5	
Kentucky bluegrass-----	5				
Green needlegrass-----	5				
MbF----- Mariaville	Shallow Limy-----	Favorable	2,300	Little bluestem-----	20
		Normal	2,000	Big bluestem-----	15
		Unfavorable	1,800	Sidecoats grama-----	10
			Threadleaf sedge-----	10	
			Needleandthread-----	10	
			Blue grama-----	5	
			Plains muhly-----	5	
Leadplant-----	5				
Fringed sagebrush-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
MeB----- Meadin	Shallow to Gravel-----	Favorable	1,500	Blue grama-----	25
		Normal	1,300	Clubmoss-----	15
		Unfavorable	1,100	Needleandthread-----	15
				Prairie sandreed-----	10
				Fringed sagebrush-----	10
				Sand bluestem-----	5
				Hairy grama-----	5
				Sand dropseed-----	5
MgF*: Meadin-----	Shallow to Gravel-----	Favorable	1,500	Blue grama-----	25
		Normal	1,300	Clubmoss-----	15
		Unfavorable	1,100	Needleandthread-----	15
				Prairie sandreed-----	10
				Fringed sagebrush-----	10
				Sand bluestem-----	5
				Hairy grama-----	5
				Sand dropseed-----	5
O'Neill-----	Sandy-----	Favorable	3,500	Sand bluestem-----	20
		Normal	3,300	Little bluestem-----	15
		Unfavorable	3,000	Prairie sandreed-----	15
				Blue grama-----	10
				Needleandthread-----	10
				Switchgrass-----	5
				Sand dropseed-----	5
				Sedge-----	5
Cudweed sagewort-----	5				
Mm, MmC, Mo, MoC--- Moody	Silty-----	Favorable	4,000	Big bluestem-----	30
		Normal	3,600	Little bluestem-----	25
		Unfavorable	3,300	Needlegrass-----	10
				Western wheatgrass-----	5
				Sideoats grama-----	5
				Sedge-----	5
Indiangrass-----	5				
Switchgrass-----	5				
NoC, NoD, NoE----- Nora	Silty-----	Favorable	4,000	Little bluestem-----	25
		Normal	3,600	Big bluestem-----	20
		Unfavorable	3,300	Sideoats grama-----	10
				Blue grama-----	10
				Western wheatgrass-----	10
				Sedge-----	5
Switchgrass-----	5				
Ob----- Obert	Wetland-----	Favorable	6,000	Prairie cordgrass-----	30
		Normal	5,400	Bluejoint reedgrass-----	15
		Unfavorable	5,000	Northern reedgrass-----	15
				Slender wheatgrass-----	10
				Spikesedge-----	5
				Sedge-----	5
Rush-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Od----- Onawa	Clayey Overflow-----	Favorable	3,500	Big bluestem-----	25
		Normal	3,100	Little bluestem-----	15
		Unfavorable	2,700	Switchgrass-----	15
				Western wheatgrass-----	10
				Indiangrass-----	10
				Green needlegrass-----	5
				Tall dropseed-----	5
Sedge-----	5				
Oe, OeC----- O'Neill	Sandy-----	Favorable	3,500	Sand bluestem-----	20
		Normal	3,300	Little bluestem-----	15
		Unfavorable	3,000	Prairie sandreed-----	15
				Blue grama-----	10
				Needleandthread-----	10
				Switchgrass-----	5
				Sand dropseed-----	5
				Sedge-----	5
Cudweed sagewort-----	5				
Og, Oh----- Ord	Subirrigated-----	Favorable	5,500	Big bluestem-----	30
		Normal	5,300	Little bluestem-----	15
		Unfavorable	5,000	Indiangrass-----	15
				Switchgrass-----	10
				Prairie cordgrass-----	10
Plains bluegrass-----	5				
Or, OrC----- Ortello	Sandy-----	Favorable	3,500	Sand bluestem-----	25
		Normal	3,300	Little bluestem-----	20
		Unfavorable	3,000	Prairie sandreed-----	10
				Needleandthread-----	10
				Switchgrass-----	5
				Western wheatgrass-----	5
				Blue grama-----	5
				Sedge-----	5
Ou----- Orwet	Wet Subirrigated-----	Favorable	5,500	Big bluestem-----	25
		Normal	5,300	Indiangrass-----	10
		Unfavorable	5,000	Switchgrass-----	15
				Prairie cordgrass-----	10
				Plains bluegrass-----	5
				Western wheatgrass-----	5
				Sedge-----	5
				Bulrush-----	5
Rush-----	5				
Ph, PhC, PhD, PhE-- Paka	Silty-----	Favorable	4,000	Little bluestem-----	25
		Normal	3,600	Big bluestem-----	20
		Unfavorable	3,300	Sideoats grama-----	10
				Needleandthread-----	10
				Switchgrass-----	5
				Indiangrass-----	5
				Blue grama-----	5
Western wheatgrass-----	5				
Sedge-----	5				

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
Pt----- Percival	Clayey Overflow-----	Favorable	3,200	Big bluestem-----	30
		Normal	2,700	Little bluestem-----	20
		Unfavorable	2,200	Switchgrass-----	15
				Western wheatgrass-----	10
		Indiangrass-----	5		
				Tall dropseed-----	5
RdD----- Redstoe	Limy Upland-----	Favorable	3,600	Little bluestem-----	35
		Normal	3,000	Big bluestem-----	10
		Unfavorable	2,100	Sideoats grama-----	10
				Needleandthread-----	10
				Prairie dropseed-----	10
				Blue grama-----	5
				Sedge-----	5
		Green needlegrass-----	5		
RgF*: Redstoe-----	Limy Upland-----	Favorable	3,600	Little bluestem-----	35
		Normal	3,000	Big bluestem-----	10
		Unfavorable	2,100	Sideoats grama-----	10
				Needleandthread-----	10
				Prairie dropseed-----	10
				Blue grama-----	5
				Sedge-----	5
		Green needlegrass-----	5		
Gavins-----	Shallow Limy-----	Favorable	3,600	Little bluestem-----	40
		Normal	3,000	Needlegrass-----	15
		Unfavorable	2,100	Sideoats grama-----	10
				Big bluestem-----	10
				Prairie dropseed-----	5
				Western wheatgrass-----	5
				Blue grama-----	5
		Sedge-----	5		
SaG----- Sansarc	Shallow Clay-----	Favorable	3,000	Little bluestem-----	25
		Normal	2,500	Western wheatgrass-----	15
		Unfavorable	1,800	Green needlegrass-----	15
				Big bluestem-----	15
				Sideoats grama-----	10
				Blue grama-----	5
		Sedge-----	5		
Sc----- Scott	Clayey Overflow-----	Favorable	3,900	Western wheatgrass-----	70
		Normal	3,300	Sedge-----	10
		Unfavorable	2,300	Big bluestem-----	5
				Switchgrass-----	5
				Buffalograss-----	5
Sh----- Shell	Silty Lowland-----	Favorable	5,300	Big bluestem-----	35
		Normal	4,900	Little bluestem-----	20
		Unfavorable	4,500	Indiangrass-----	5
				Switchgrass-----	5
				Kentucky bluegrass-----	5
				Porcupinegrass-----	5
				Sedge-----	5
				Canada wildrye-----	5
		Tall dropseed-----	5		

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
SsF2, StC----- Simeon	Sands-----	Favorable	2,800	Sand bluestem-----	20
		Normal	2,500	Blue grama-----	15
		Unfavorable	2,100	Little bluestem-----	15
				Prairie sandreed-----	15
		Needleandthread-----	15		
		Sand dropseed-----	5		
SuC----- Simeon	Sandy-----	Favorable	3,000	Sand bluestem-----	20
		Normal	2,700	Blue grama-----	15
		Unfavorable	2,400	Little bluestem-----	15
				Prairie sandreed-----	15
		Needleandthread-----	15		
		Sand dropseed-----	5		
SvF*: Simeon-----	Sands-----	Favorable	2,800	Sand bluestem-----	20
		Normal	2,500	Blue grama-----	15
		Unfavorable	2,100	Little bluestem-----	15
				Prairie sandreed-----	15
		Needleandthread-----	15		
		Sand dropseed-----	5		
Thurman-----	Sandy-----	Favorable	3,500	Sand bluestem-----	25
		Normal	3,300	Little bluestem-----	20
		Unfavorable	3,000	Prairie sandreed-----	15
				Needleandthread-----	15
		Blue grama-----	10		
		Switchgrass-----	5		
Sw----- Solomon	Clayey Overflow-----	Favorable	8,500	Big bluestem-----	35
		Normal	6,000	Indiangrass-----	15
		Unfavorable	3,500	Switchgrass-----	10
				Prairie cordgrass-----	5
				Tall dropseed-----	5
				Western wheatgrass-----	5
				Little bluestem-----	5
				Sideoats grama-----	5
		Eastern gamagrass-----	5		
TfB, Tfc, ThB, ThC, ToB, ToD, ToF----- Thurman	Sandy-----	Favorable	3,500	Sand bluestem-----	25
		Normal	3,300	Little bluestem-----	20
		Unfavorable	3,000	Prairie sandreed-----	15
				Needleandthread-----	15
		Blue grama-----	10		
		Switchgrass-----	5		
Tr----- Trent	Silty-----	Favorable	4,800	Big bluestem-----	30
		Normal	4,000	Little bluestem-----	30
		Unfavorable	2,800	Needlegrass-----	20
				Sideoats grama-----	5
		Leadplant-----	5		
		Sedge-----	5		
Tx----- Trent	Silty Lowland-----	Favorable	5,700	Big bluestem-----	65
		Normal	4,800	Green needlegrass-----	10
		Unfavorable	3,400	Western wheatgrass-----	5
				Sideoats grama-----	5
		Leadplant-----	5		
		Sedge-----	5		

See footnote at end of table.

TABLE 8.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
VaD, VaE----- Valentine	Sands-----	Favorable	3,000	Sand bluestem-----	25
		Normal	2,600	Little bluestem-----	20
		Unfavorable	2,200	Prairie sandreed-----	20
				Switchgrass-----	10
				Blue grama-----	5
				Needleandthread-----	5
				Sand lovegrass-----	5
Ve, VeC, VeD----- Verdel	Clayey-----	Favorable	3,800	Big bluestem-----	25
		Normal	3,400	Western wheatgrass-----	25
		Unfavorable	3,000	Little bluestem-----	5
				Switchgrass-----	5
				Sedge-----	5
				Tall dropseed-----	5
				Blue grama-----	5
				Kentucky bluegrass-----	5
Green needlegrass-----	5				
VfC, VfD, VfF----- Verdigre	Silty-----	Favorable	3,500	Sand bluestem-----	30
		Normal	3,000	Little bluestem-----	20
		Unfavorable	2,200	Prairie sandreed-----	20
				Needleandthread-----	10
				Blue grama-----	5
				Switchgrass-----	5
				Indiangrass-----	5
				Sand lovegrass-----	5
VgC, VgD, VgF----- Verdigre	Silty-----	Favorable	4,000	Big bluestem-----	20
		Normal	3,200	Little bluestem-----	20
		Unfavorable	2,200	Sideoats grama-----	10
				Western wheatgrass-----	10
				Blue grama-----	5
				Switchgrass-----	5
				Needleandthread-----	5
				Green needlegrass-----	5
				Indiangrass-----	5
				Sedge-----	5

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

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(Only the soils suitable for windbreaks and environmental plantings are listed. The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Aa----- Albaton	Lilac-----	Siberian peashrub	Eastern redcedar, blue spruce, Russian-olive, hackberry, ponderosa pine.	Golden willow, honeylocust, green ash.	Eastern cottonwood.
AcC, AcD----- Alcester	---	Lilac, Siberian peashrub, American plum.	Bur oak, blue spruce, hackberry, Russian-olive, eastern redcedar.	Honeylocust, ponderosa pine, green ash.	---
Ao----- Aowa	American plum-----	Autumn-olive, Amur honeysuckle, common chokecherry, lilac.	Eastern redcedar, Russian mulberry.	Austrian pine, ponderosa pine, green ash, hackberry.	Eastern cottonwood.
Bd, BdC, BdD, Bn, BnC, BnD----- Bazile	---	Siberian peashrub, American plum, lilac.	Hackberry, Russian-olive, bur oak.	Eastern redcedar, Austrian pine, ponderosa pine, green ash, honeylocust.	---
BoD2, BoE2----- Betts	Silver buffaloberry, American plum.	Russian-olive, hackberry, eastern redcedar, Rocky Mountain juniper, Siberian peashrub.	Siberian elm, honeylocust, green ash, ponderosa pine.	---	---
Bp----- Blendon	Skunkbush sumac, lilac.	Eastern redcedar, Siberian peashrub, Russian-olive, Manchurian crabapple.	Green ash, honeylocust, hackberry, ponderosa pine.	Siberian elm-----	---
Br----- Blyburg	---	Siberian peashrub, lilac.	Eastern redcedar, bur oak, ponderosa pine, Russian-olive.	Golden willow, green ash, hackberry, honeylocust.	Eastern cottonwood.
Bs----- Boel	Redosier dogwood, American plum.	Common chokecherry	Hackberry, green ash, Austrian pine, Russian mulberry, eastern redcedar.	Honeylocust, silver maple, golden willow.	Eastern cottonwood.
Bt, BtC, BtD----- Boelus	Lilac, skunkbush sumac.	Siberian peashrub, Manchurian crabapple, eastern redcedar, Russian-olive.	Green ash, ponderosa pine, hackberry, honeylocust.	Siberian elm-----	---

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
BwD----- Brunswick	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine, jack pine.	---	---
BxE*: Brunswick-----	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine, jack pine.	---	---
Paka-----	Peking cotoneaster, skunkbush sumac, lilac.	Amur maple, autumn-olive, Amur honeysuckle.	Eastern redcedar, Russian mulberry, green ash.	Ponderosa pine, honeylocust, Austrian pine.	---
By----- Butler	---	---	Eastern redcedar, ponderosa pine, hackberry, blue spruce.	Golden willow, green ash, honeylocust, silver maple.	Eastern cottonwood.
Co----- Coleridge	---	Amur honeysuckle, lilac.	Eastern redcedar, ponderosa pine, hackberry.	Austrian pine, Scotch pine, green ash, golden willow, honeylocust, silver maple.	Eastern cottonwood.
CrC2, CrD2, CrE2-- Crofton	Silver buffaloberry, American plum.	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Russian-olive, hackberry.	Ponderosa pine, honeylocust, Siberian elm, green ash.	---	---
CsC2*, CsD2*, CsE2*: Crofton-----	Silver buffaloberry, American plum.	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Russian-olive, hackberry.	Ponderosa pine, honeylocust, Siberian elm, green ash.	---	---
Nora-----	---	Lilac, Siberian peashrub, American plum.	Bur oak, hackberry, blue spruce, Russian- olive, eastern redcedar.	Honeylocust, green ash, ponderosa pine.	---
CtD2*, CtE2*: Crofton-----	Silver buffaloberry, American plum.	Eastern redcedar, Rocky Mountain juniper, Siberian peashrub, Russian-olive, hackberry.	Ponderosa pine, honeylocust, Siberian elm, green ash.	---	---
Thurman-----	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine, jack pine, Scotch pine.	---	---

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ef, Eh----- Elsmere	Lilac-----	Common chokecherry, Siberian peashrub.	Eastern redcedar, green ash, Manchurian crabapple, hackberry, ponderosa pine.	Honeylocust, golden willow.	Eastern cottonwood.
Et, EtC----- Eltree	American plum-----	Amur honeysuckle, lilac.	Eastern redcedar, ponderosa pine, Russian mulberry, Russian-olive, Austrian pine, green ash.	Honeylocust, hackberry.	Eastern cottonwood.
Fm----- Fillmore	Redosier dogwood, American plum.	Common chokecherry	Eastern redcedar, green ash, hackberry, Russian mulberry, Austrian pine.	Golden willow, silver maple, honeylocust.	Eastern cottonwood.
Gf----- Gibbon	American plum, redosier dogwood.	---	Eastern redcedar, hackberry, Austrian pine, green ash, Russian mulberry.	Silver maple, golden willow, honeylocust.	Eastern cottonwood, common chokecherry.
Hd----- Hobbs	American plum-----	Amur honeysuckle, lilac, Siberian peashrub.	Eastern redcedar, Austrian pine, ponderosa pine, green ash, Russian mulberry.	Hackberry, honeylocust.	Eastern cottonwood.
Ho----- Hord	---	Eastern redcedar, Siberian peashrub, American plum, lilac.	Ponderosa pine, hackberry, blue spruce, bur oak, Russian-olive.	Green ash, honeylocust.	---
If----- Inavale	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine.	---	---
Ih----- Inavale	Lilac, American plum.	Common chokecherry	Eastern redcedar, Austrian pine, Scotch pine, ponderosa pine, green ash, honeylocust, hackberry, Russian mulberry.	Siberian elm-----	---
Im----- Inavale	Lilac, American plum.	Common chokecherry	Eastern redcedar, Russian mulberry, ponderosa pine, hackberry, Austrian pine, Scotch pine, green ash, honeylocust.	Siberian elm-----	---

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ke----- Kezan	Redosier dogwood, lilac.	Siberian peashrub	Eastern redcedar, green ash, ponderosa pine, hackberry.	Golden willow, honeylocust.	Eastern cottonwood.
LbD----- Labu	Siberian peashrub, lilac, skunkbush sumac.	Rocky Mountain juniper, Russian- olive, eastern redcedar, Manchurian crabapple, hackberry.	Green ash, honeylocust, Siberian elm.	---	---
LhC2, LhD2----- Longford	Lilac, fragrant sumac, Amur honeysuckle.	Russian mulberry	Eastern redcedar, bur oak, honeylocust, green ash, Austrian pine, hackberry, Russian-olive.	Siberian elm-----	---
Lk, LkC----- Loretto	Skunkbush sumac---	Siberian peashrub, American plum, lilac.	Eastern redcedar, honeylocust, Russian-olive, green ash, hackberry, ponderosa pine.	---	Siberian elm.
LzD*: Lynch-----	Skunkbush sumac, Siberian peashrub, lilac.	Eastern redcedar, Rocky Mountain juniper, Russian- olive, hackberry, Manchurian crabapple.	Siberian elm, honeylocust, green ash.	---	---
Verdel-----	Peking cotoneaster, lilac.	Siberian crabapple, common chokecherry, Siberian peashrub, American plum, silver buffaloberry.	Eastern redcedar, green ash, Russian-olive, hackberry, ponderosa pine.	---	---
MgF*: Meadin.					
O'Neill-----	Siberian peashrub, lilac, Peking cotoneaster.	Eastern redcedar, ponderosa pine, Rocky Mountain juniper, Russian- olive, Manchurian crabapple, bur oak.	Siberian elm, honeylocust, green ash.	---	---
Mm, MmC, Mo, MoC-- Moody	---	Siberian peashrub, American plum, lilac.	Blue spruce, hackberry, eastern redcedar, bur oak, Russian- olive.	Ponderosa pine, green ash, honeylocust.	---

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
NoC, NoD, NoE----- Nora	---	Lilac, Siberian peashrub, American plum.	Bur oak, hackberry, blue spruce, Russian-olive, eastern redcedar.	Honeylocust, green ash, ponderosa pine.	---
Od----- Onawa	---	Siberian peashrub, lilac.	Ponderosa pine, bur oak, eastern redcedar, Russian-olive.	Golden willow, honeylocust, hackberry, green ash.	Eastern cottonwood.
Oe, OeC----- O'Neill	Siberian peashrub, lilac, Peking cotoneaster.	Eastern redcedar, ponderosa pine, Rocky Mountain juniper, Russian-olive, Manchurian crabapple, bur oak.	Siberian elm, honeylocust, green ash.	---	---
Og, Oh----- Ord	Lilac, American plum.	Common chokecherry	Eastern redcedar, ponderosa pine, Russian mulberry, green ash, hackberry.	Golden willow, honeylocust.	Eastern cottonwood.
Or, OrC----- Ortello	Skunkbush sumac---	Eastern redcedar, common chokecherry, Manchurian crabapple, Siberian peashrub, Russian-olive.	Ponderosa pine, green ash, honeylocust, hackberry.	Siberian elm-----	---
Ou----- Orwet	Redosier dogwood	---	Golden willow-----	---	Eastern cottonwood.
Ph, PhC, PhD, PhE- Paka	Peking cotoneaster, skunkbush sumac, lilac.	Amur maple, autumn-olive, Amur honeysuckle.	Eastern redcedar, Russian mulberry, green ash.	Ponderosa pine, honeylocust, Austrian pine.	---
Pt----- Percival	---	Lilac, Siberian peashrub.	Ponderosa pine, bur oak, Russian-olive, eastern redcedar.	Golden willow, honeylocust, green ash, hackberry.	Eastern cottonwood.
RdD----- Redstoe	American plum, silver buffaloberry.	Russian-olive, hackberry, Rocky Mountain juniper, eastern redcedar, Siberian peashrub.	Siberian elm, ponderosa pine, green ash, honeylocust.	---	---
Sh----- Shell	---	Autumn-olive, Amur honeysuckle, Peking cotoneaster, American plum, lilac.	Eastern redcedar, bur oak.	Green ash, Austrian pine, hackberry, honeylocust.	Eastern cottonwood.

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
StC, SuC----- Simeon	---	Eastern redcedar, Rocky Mountain juniper, jack pine.	Austrian pine, ponderosa pine.	---	---
SvF*: Simeon.					
Thurman-----	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine, jack pine, Scotch pine.	---	---
Sw----- Solomon	Lilac-----	Siberian peashrub	Hackberry, ponderosa pine, eastern redcedar, Russian-olive, blue spruce.	Golden willow, honeylocust, green ash.	Eastern cottonwood.
TfB, TfC, ThB, ThC, ToB----- Thurman	Amur honeysuckle, skunkbush sumac, lilac.	Eastern redcedar, Manchurian crabapple, Russian-olive, Siberian peashrub.	Ponderosa pine, green ash, honeylocust, hackberry.	Siberian elm-----	---
ToD, ToF----- Thurman	---	Eastern redcedar, Rocky Mountain juniper.	Austrian pine, ponderosa pine, jack pine, Scotch pine.	---	---
Tr----- Trent	Peking cotoneaster	Siberian peashrub, American plum, lilac.	Ponderosa pine, Manchurian crabapple, eastern redcedar.	Honeylocust, golden willow, green ash, hackberry.	Eastern cottonwood.
Tx----- Trent	---	Siberian peashrub, American plum, lilac.	Ponderosa pine, blue spruce, Siberian crabapple, eastern redcedar.	Golden willow, green ash, hackberry.	Eastern cottonwood, Siberian elm.
VaD, VaE----- Valentine	---	Eastern redcedar, Rocky Mountain juniper.	Ponderosa pine, Austrian pine, jack pine.	---	---
Ve, VeC, VeD----- Verdel	Peking cotoneaster, lilac.	Siberian crabapple, common chokecherry, Siberian peashrub, American plum, silver buffaloberry.	Eastern redcedar, green ash, Russian-olive, hackberry, ponderosa pine.	---	---

See footnote at end of table.

TABLE 9.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
VfC, VfD----- Verdigre	Siberian peashrub, lilac, Amur honeysuckle, skunkbush sumac.	Eastern redcedar, Russian-olive, hackberry, Siberian elm, Manchurian crabapple, Rocky Mountain juniper.	Honeylocust-----	---	---
VgC, VgD----- Verdigre	Siberian peashrub, lilac, Amur honeysuckle, skunkbush sumac.	Eastern redcedar, Russian-olive, hackberry, Siberian elm, Manchurian crabapple, Rocky Mountain juniper.	Honeylocust-----	---	---

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

TABLE 10.--RECREATIONAL DEVELOPMENT

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

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Aa----- Albaton	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: too clayey.
Ab----- Albaton	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, flooding.	Severe: ponding, too clayey.
AcC----- Alcester	Slight-----	Slight-----	Moderate: slope.	Slight.
AcD----- Alcester	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Ao----- Aowa	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
Ar----- Aowa	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
Ba----- Barney	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Bd----- Bazile	Slight-----	Slight-----	Slight-----	Slight.
BdC----- Bazile	Slight-----	Slight-----	Moderate: slope.	Slight.
BdD----- Bazile	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Bn----- Bazile	Slight-----	Slight-----	Slight-----	Slight.
BnC----- Bazile	Slight-----	Slight-----	Moderate: slope.	Slight.
BnD----- Bazile	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
BoD2, BoE2----- Betts	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
BoF----- Betts	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
BoG----- Betts	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bp----- Blendon	Slight-----	Slight-----	Slight-----	Slight.
Br----- Blyburg	Severe: flooding.	Slight-----	Slight-----	Slight.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Bs----- Boel	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
Bt----- Boelus	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
BtC----- Boelus	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
BtD----- Boelus	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
BvG----- Bristow	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
BwD----- Brunswick	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
BxE*: Brunswick-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Paka-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
BxF*: Brunswick-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Paka-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
By----- Butler	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Co----- Coleridge	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding, percs slowly.	Moderate: wetness.
CrC2----- Crofton	Slight-----	Slight-----	Moderate: slope.	Severe: erodes easily.
CrD2, CrE2----- Crofton	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
CrF----- Crofton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
CrG----- Crofton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
CsC2*: Crofton-----	Slight-----	Slight-----	Moderate: slope.	Severe: erodes easily.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
CsC2*: Nora-----	Slight-----	Slight-----	Moderate: slope.	Slight.
CsD2*, CsE2*: Crofton-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Nora-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CtD2*, CtE2*: Crofton-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
Thurman-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CtF*: Crofton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.
Thurman-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Ef, Eh----- Elsmere	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Et----- Eltree	Slight-----	Slight-----	Slight-----	Slight.
EtC----- Eltree	Slight-----	Slight-----	Moderate: slope.	Slight.
Fm----- Fillmore	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
Fu----- Fluvaquents	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.
GaG----- Gavins	Severe: slope, thin layer, area reclaim.	Severe: slope, thin layer, area reclaim.	Severe: slope, thin layer, area reclaim.	Severe: slope, erodes easily.
Gf----- Gibbon	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding, percs slowly.	Moderate: wetness.
Hd----- Hobbs	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
Ho----- Hord	Slight-----	Slight-----	Slight-----	Slight.
If, Ig----- Inavale	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Ih----- Inavale	Severe: flooding.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
Im----- Inavale	Severe: flooding.	Slight-----	Slight-----	Slight.
Ke----- Kezan	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
KzB----- Kezan	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.
LbD----- Labu	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
LcF*: Labu-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Sansarc-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
LhC2----- Longford	Slight-----	Slight-----	Moderate: slope.	Slight.
LhD2----- Longford	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Lk----- Loretto	Slight-----	Slight-----	Slight-----	Slight.
LkC----- Loretto	Slight-----	Slight-----	Moderate: slope.	Slight.
LyF*: Lynch-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Bristow-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
LzD*: Lynch-----	Moderate: slope, percs slowly, too clayey.	Moderate: slope, too clayey, percs slowly.	Severe: slope.	Moderate: too clayey.
Verdel-----	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
MbF----- Mariaville	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
MeB----- Meadin	Slight-----	Slight-----	Moderate: small stones.	Slight.
MgF*: Meadin-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
O'Neill-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Mm----- Moody	Slight-----	Slight-----	Slight-----	Slight.
MmC----- Moody	Slight-----	Slight-----	Moderate: slope.	Slight.
Mo----- Moody	Slight-----	Slight-----	Slight-----	Slight.
MoC----- Moody	Slight-----	Slight-----	Moderate: slope.	Slight.
NoC----- Nora	Slight-----	Slight-----	Moderate: slope.	Slight.
NoD, NoE----- Nora	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Ob----- Obert	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Od----- Onawa	Severe: flooding, too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
Oe----- O'Neill	Slight-----	Slight-----	Slight-----	Slight.
OeC----- O'Neill	Slight-----	Slight-----	Moderate: slope.	Slight.
Og, Oh----- Ord	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
Or----- Ortello	Slight-----	Slight-----	Slight-----	Slight.
OrC----- Ortello	Slight-----	Slight-----	Moderate: slope.	Slight.
Ou----- Orwet	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
Ph----- Paka	Slight-----	Slight-----	Slight-----	Slight.
PhC----- Paka	Slight-----	Slight-----	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
PhD, PhE----- Paka	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Pt----- Percival	Severe: flooding, too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
RdD----- Redstoe	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
RgF*: Redstoe-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Gavins-----	Severe: slope, thin layer, area reclaim.	Severe: slope, thin layer, area reclaim.	Severe: slope, thin layer, area reclaim.	Severe: erodes easily.
SaG----- Sansarc	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.
Sc----- Scott	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.
Sh----- Shell	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
SsF2----- Simeon	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
StC----- Simeon	Slight-----	Slight-----	Moderate: slope.	Slight.
SuC----- Simeon	Slight-----	Slight-----	Slight-----	Slight.
SvF*: Simeon-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Thurman-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Sw----- Solomon	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.
TfB, TfC----- Thurman	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
ThB----- Thurman	Slight-----	Slight-----	Slight-----	Slight.
ThC----- Thurman	Slight-----	Slight-----	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
ToB----- Thurman	Slight-----	Slight-----	Slight-----	Slight.
ToD----- Thurman	Slight-----	Slight-----	Severe: slope.	Slight.
ToF----- Thurman	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Tr----- Trent	Slight-----	Slight-----	Slight-----	Slight.
Tx----- Trent	Severe: wetness.	Slight-----	Slight-----	Slight.
UbF*----- Urban land	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
VaD----- Valentine	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
VaE----- Valentine	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Ve----- Verdel	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
VeC----- Verdel	Moderate: too clayey.	Moderate: too clayey.	Moderate: slope, too clayey.	Moderate: too clayey.
VeD----- Verdel	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
VfC----- Verdigre	Slight-----	Slight-----	Moderate: slope.	Slight.
VfD----- Verdigre	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
VfF----- Verdigre	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
VgC----- Verdigre	Slight-----	Slight-----	Moderate: slope.	Slight.
VgD----- Verdigre	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
VgF----- Verdigre	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.

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

TABLE 11.--WILDLIFE HABITAT

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

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Aa----- Albaton	Fair	Fair	Fair	Poor	Very poor.	---	Good	Good	Fair	Poor	Good	---
Ab----- Albaton	Very poor.	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor.
AcC----- Alcester	Good	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
AcD----- Alcester	Fair	Good	Good	Fair	Very poor.	---	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
Ao----- Aowa	Good	Fair	Fair	---	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Good.
Ar----- Aowa	Poor	Fair	Poor	---	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Poor.
Ba----- Barney	Very poor.	Poor	Fair	Poor	Poor	Fair	Good	Good	Poor	Poor	Good	Fair.
Bd----- Bazile	Fair	Fair	Good	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	Good.
BdC, BdD----- Bazile	Fair	Good	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
Bn----- Bazile	Good	Good	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	Good.
BnC, BnD----- Bazile	Fair	Good	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
BoD2----- Betts	Poor	Fair	Fair	Poor	Very poor.	---	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Fair.
BoE2, BoF----- Betts	Very poor.	Poor	Fair	Poor	Very poor.	---	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
BoG----- Betts	Very poor.	Very poor.	Fair	Poor	Very poor.	---	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
Bp----- Blendon	Fair	Fair	Good	Fair	Very poor.	---	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
Br----- Blyburg	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
Bs----- Boel	Fair	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Poor	Fair.
Bt, BtC, BtD----- Boelus	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
BvG----- Bristow	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
BwD----- Brunswick	Poor	Poor	Good	---	Good	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
BxE*: Brunswick-----	Poor	Poor	Good	---	Good	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Paka-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
BxF*: Brunswick-----	Poor	Poor	Good	---	Good	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Paka-----	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
By----- Butler	Good	Good	Good	---	Good	Good	Fair	Fair	Good	---	Fair	Good.
Co----- Coleridge	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
CrC2, CrD2, CrE2--- Crofton	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
CrF, CrG----- Crofton	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
CsC2*: Crofton-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Nora-----	Fair	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
CsD2*: Crofton-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Nora-----	Poor	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
CsE2*: Crofton-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Nora-----	Poor	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
CtD2*, CtE2*: Crofton-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Thurman-----	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
CtF*: Crofton-----	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
CtF*: Thurman-----	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Ef----- Elsmere	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair.
Eh----- Elsmere	Good	Good	Good	Fair	Fair	Good	Fair	Fair	Good	Fair	Fair	Good.
Et----- Eltree	Good	Good	Fair	---	---	Fair	Poor	Very poor.	Good	---	Very poor.	Fair.
EtC----- Eltree	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Fm----- Fillmore	Fair	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
Fu----- Fluvaquents	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good	Very poor.
GaG----- Gavins	Very poor.	Very poor.	Fair	Poor	Very poor.	---	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
Gf----- Gibbon	Good	Good	Good	Good	Fair	Good	Fair	Good	Good	Good	Fair	Good.
Hd----- Hobbs	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good.
Ho----- Hord	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
If----- Inavale	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Ig----- Inavale	Very poor.	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Ih, Im----- Inavale	Fair	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Good.
Ke, KzB----- Kezan	Poor	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	Fair.
LbD----- Labu	Fair	Good	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
LcF*: Labu-----	Poor	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Sansarc-----	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
LhC2, LhD2----- Longford	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Lk, LkC----- Loretto	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
LyF*: Lynch-----	Poor	Fair	Poor	---	Good	Good	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Bristow-----	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
LzD*: Lynch-----	Fair	Fair	Poor	---	Good	Good	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Verdel-----	Poor	Good	Fair	Good	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
MbF----- Mariaville	Poor	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Poor.
MeB----- Meadin	Poor	Poor	Fair	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
MgF*: Meadin-----	Very poor.	Poor	Fair	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
O'Neill-----	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Mm, MmC, Mo, MoC--- Moody	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
NoC----- Nora	Good	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
NoD----- Nora	Fair	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
NoE----- Nora	Poor	Good	Good	Good	Very poor.	---	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
Ob----- Obert	Very poor.	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor.
Od----- Onawa	Fair	Fair	Fair	Poor	Very poor.	---	Good	Good	Fair	Poor	Good	---
Oe, OeC----- O'Neill	Fair	Good	Good	Fair	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.	Fair.
Og, Oh----- Ord	Good	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	Good.
Or----- Ortello	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
OrC----- Ortello	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Ou----- Orwet	Poor	Fair	Fair	---	Fair	Fair	Good	Good	Poor	---	Good	Fair.
Ph, PhC----- Paka	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	Good.
PhD, PhE----- Paka	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Pt----- Percival	Fair	Fair	Fair	Fair	Poor	---	Fair	Fair	Fair	Fair	Fair	---
RdD----- Redstoe	Fair	Good	Good	---	---	---	Poor	Very poor.	Good	---	Very poor.	Good.
RgF*: Redstoe-----	Poor	Fair	Good	---	---	---	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Gavins-----	Very poor.	Very poor.	Fair	Poor	Very poor.	---	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
SaG----- Sansarc	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
Sc----- Scott	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good	Fair.
Sh----- Shell	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Very poor.	Good.
SsF2----- Simeon	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
StC, SuC----- Simeon	Fair	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
SvF*: Simeon-----	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
Thurman-----	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Sw----- Solomon	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	---
TfB, TfC, ThB, ThC, ToB----- Thurman	Fair	Good	Good	Fair	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
ToD, ToF----- Thurman	Poor	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Tr----- Trent	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	Good.
Tx----- Trent	Good	Good	Fair	Good	Very poor.	---	Very poor.	Very poor.	Good	Very poor.	Very poor.	Fair.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
UbF*. Urban land												
VaD, VaE----- Valentine	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
Ve----- Verdel	Good	Good	Fair	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.	Fair.
VeC----- Verdel	Fair	Good	Fair	Good	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
VeD----- Verdel	Poor	Good	Fair	Good	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
VfC----- Verdigre	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	Good.
VfD----- Verdigre	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
VfF----- Verdigre	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
VgC----- Verdigre	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.	Good.
VgD----- Verdigre	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
VgF----- Verdigre	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.

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

TABLE 12.--BUILDING SITE DEVELOPMENT

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

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Aa----- Albaton	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: too clayey.
Ab----- Albaton	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, flooding, too clayey.
AcC----- Alcester	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
AcD----- Alcester	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Ao----- Aowa	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: flooding.
Ar----- Aowa	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
Ba----- Barney	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Bd----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
BdC----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
BdD----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Bn----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
BnC----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
BnD----- Bazile	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BoD2, BoE2----- Betts	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
BoF, BoG----- Betts	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Bp----- Blendon	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Moderate: frost action.	Slight.
Br----- Blyburg	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: frost action.	Slight.
Bs----- Boel	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, droughty, flooding.
Bt----- Boelus	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
BtC----- Boelus	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
BtD----- Boelus	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
BvG----- Bristow	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, depth to rock, too clayey.
BwD----- Brunswick	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope, depth to rock.
BxE*: Brunswick-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope, depth to rock.
Paka-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
BxF*: Brunswick-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Paka-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
By----- Butler	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Co----- Coleridge	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
CrC2----- Crofton	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: low strength.	Slight.
CrD2, CrE2----- Crofton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
CrF, CrG----- Crofton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
CsC2*: Crofton-----	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: low strength.	Slight.
Nora-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
CsD2*, CsE2*: Crofton-----	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Nora-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
CtD2*, CtE2*: Crofton-----	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Thurman-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty.
CtF*: Crofton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Thurman-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ef, Eh----- Elsmere	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding, frost action.	Moderate: wetness, droughty.
Et----- Eltree	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EtC----- Etree	Slight-----	Slight-----	Slight-----	Moderate: slope.	Moderate: low strength, frost action.	Slight.
Fm----- Fillmore	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Fu----- Fluvaquents	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.
GaG----- Gavins	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: low strength, slope.	Severe: slope, thin layer, area reclaim.
Gf----- Gibbon	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: wetness, flooding.
Hd----- Hobbs	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Ho----- Hord	Slight-----	Slight-----	Slight-----	Slight-----	Severe: low strength.	Slight.
If----- Inavale	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
Ig----- Inavale	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Ih, Im----- Inavale	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
Ke----- Kezan	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
KzB----- Kezan	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
LbD----- Labu	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: too clayey.
LcF*: Labu-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LcF*: Sansarc-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock, too clayey.
LhC2----- Longford	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
LhD2----- Longford	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
Lk----- Loretto	Slight-----	Slight-----	Slight-----	Slight-----	Severe: low strength.	Slight.
LkC----- Loretto	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: low strength.	Slight.
LyF*: Lynch-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.
Bristow-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, depth to rock, too clayey.
LzD*: Lynch-----	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: too clayey.
Verdel-----	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: too clayey.
MbF----- Mariaville	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock.
MeB----- Meadin	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
MgF*: Meadin-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
O'Neill-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mm----- Moody	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MmC----- Moody	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Mo----- Moody	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
MoC----- Moody	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
NoC----- Nora	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
NoD, NoE----- Nora	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
Ob----- Obert	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
Od----- Onawa	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Severe: too clayey.
Oe----- O'Neill	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Moderate: frost action.	Moderate: droughty.
OeC----- O'Neill	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
Og, Oh----- Ord	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: wetness, flooding.
Or----- Ortello	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Moderate: frost action.	Slight.
OrC----- Ortello	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.	Slight.
Ou----- Orwet	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding, frost action.	Moderate: wetness.
Ph----- Paka	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
PhC----- Paka	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
PhD, PhE----- Paka	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Pt----- Percival	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding, frost action.	Severe: too clayey.
RdD----- Redstoe	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer, area reclaim.
RgF*: Redstoe-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Gavins-----	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: low strength, slope.	Severe: slope, thin layer, area reclaim.
SaG----- Sansarc	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock, too clayey.
Sc----- Scott	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
Sh----- Shell	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
SsF2----- Simeon	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
StC----- Simeon	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
SuC----- Simeon	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
SvF*: Simeon-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Thurman-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sw----- Solomon	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, too clayey.
TfB----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TfC----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
ThB----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
ThC----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
ToB----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
ToD----- Thurman	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
ToF----- Thurman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tr----- Trent	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
Tx----- Trent	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
UbF*----- Urban land	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
VaD----- Valentine	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
VaE----- Valentine	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ve, VeC----- Verdel	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: too clayey.
VeD----- Verdel	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: too clayey.
VfC----- Verdigre	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
VfD----- Verdigre	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: slope.
VfF----- Verdigre	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope.	Severe: slope.
VgC----- Verdigre	Moderate: too clayey.	Moderate: shrink-swell.	Severe: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
VgD----- Verdigre	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: slope.
VgF----- Verdigre	Severe: slope.	Severe: slope.	Severe: slope, shrink-swell.	Severe: slope.	Severe: slope.	Severe: slope.

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

TABLE 13.--SANITARY FACILITIES

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

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Aa----- Albaton	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Ab----- Albaton	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
AcC----- Alcester	Slight-----	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
AcD----- Alcester	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Ao, Ar----- Aowa	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Ba----- Barney	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Bd, BdC----- Bazile	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BdD----- Bazile	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bn, BnC----- Bazile	Severe: percs slowly, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BnD----- Bazile	Severe: percs slowly, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BoD2, BoE2----- Betts	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
BoF, BoG----- Betts	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Bp----- Blendon	Slight: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.
Br----- Blyburg	Moderate: flooding, percs slowly.	Moderate: seepage.	Moderate: flooding.	Moderate: flooding.	Good.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Bs----- Boel	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Bt, BtC----- Boelus	Moderate: percs slowly.	Severe: seepage.	Moderate: too clayey.	Severe: seepage.	Fair: too clayey.
BtD----- Boelus	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope, too clayey.	Severe: seepage.	Fair: too clayey, slope.
BvG----- Bristow	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
BwD----- Brunswick	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
BxE*: Brunswick-----	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.
Paka-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
BxF*: Brunswick-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Paka-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
By----- Butler	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Co----- Coleridge	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
CrC2----- Crofton	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----	Slight-----	Good.
CrD2, CrE2----- Crofton	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CrF, CrG----- Crofton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
CsC2*: Crofton-----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----	Slight-----	Good.
Nora-----	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
CsD2*, CsE2*: Crofton-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Nora-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
CtD2*, CtE2*: Crofton-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Thurman-----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CtF*: Crofton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Thurman-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Ef, Eh----- Elsmere	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Et----- Eltree	Slight-----	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
EtC----- Eltree	Slight-----	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
Fm----- Fillmore	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Fu----- Fluvaquents	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GaG----- Gavins	Severe: thin layer, seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: area reclaim, hard to pack, slope.
Gf----- Gibbon	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Hd----- Hobbs	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: hard to pack.
Ho----- Hord	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
If----- Inavale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Ig----- Inavale	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
Ih, Im----- Inavale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Ke, KzB----- Kezan	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
LbD----- Labu	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
LcF*: Labu-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Sansarc-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, hard to pack, slope.
LhC2----- Longford	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
LhD2----- Longford	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Lk, LkC----- Loretto	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LyF*: Lynch-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Bristow-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
LzD*: Lynch-----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Verdel-----	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
MbF----- Mariaville	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
MeB----- Meadin	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
MgF*: Meadin-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
O'Neill-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Mm----- Moody	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Poor: hard to pack.
MmC----- Moody	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Poor: hard to pack.
Mo----- Moody	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Poor: hard to pack.
MoC----- Moody	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Poor: hard to pack.
NoC----- Nora	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NoD, NoE----- Nora	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Ob----- Obert	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: hard to pack, ponding.
Od----- Onawa	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.
Oe, OeC----- O'Neill	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Og, Oh----- Ord	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
Or, OrC----- Ortello	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Ou----- Orwet	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Ph----- Paka	Severe: percs slowly.	Moderate: seepage, depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
PhC----- Paka	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
PhD, PhE----- Paka	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
Pt----- Percival	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy.
RdD----- Redstoe	Severe: thin layer, seepage.	Severe: seepage, slope.	Severe: seepage.	Moderate: seepage, slope.	Poor: area reclaim, hard to pack.
RgF*: Redstoe-----	Severe: thin layer, seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: area reclaim, hard to pack, slope.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RgF*: Gavins-----	Severe: thin layer, seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: area reclaim, hard to pack, slope.
SaG----- Sansarc	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, hard to pack, slope.
Sc----- Scott	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Sh----- Shell	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
SsF2----- Simeon	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
StC, SuC----- Simeon	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
SvF*: Simeon-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Thurman-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Sw----- Solomon	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
TfB, TfC, ThB, ThC, ToB----- Thurman	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
ToD----- Thurman	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
ToF----- Thurman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Tr----- Trent	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Tx----- Trent	Severe: wetness, percs slowly.	Slight-----	Moderate: wetness.	Moderate: wetness.	Good.
UbF*----- Urban land	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
VaD----- Valentine	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
VaE----- Valentine	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Ve----- Verdel	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
VeC----- Verdel	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
VeD----- Verdel	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
VfC----- Verdigre	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
VfD----- Verdigre	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
VfF----- Verdigre	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
VgC----- Verdigre	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
VgD----- Verdigre	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
VgF----- Verdigre	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.

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

TABLE 14.--CONSTRUCTION MATERIALS

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

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Aa----- Albaton	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ab----- Albaton	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
AcC----- Alcester	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
AcD----- Alcester	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Ao, Ar----- Aowa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Ba----- Barney	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: area reclaim, too sandy, wetness.
Bd, BdC----- Bazile	Good-----	Probable-----	Improbable: too sandy.	Fair: too clayey, thin layer.
BdD----- Bazile	Good-----	Probable-----	Improbable: too sandy.	Fair: too clayey, thin layer, slope.
Bn, BnC----- Bazile	Good-----	Probable-----	Improbable: too sandy.	Fair: too clayey, thin layer.
BnD----- Bazile	Good-----	Probable-----	Improbable: too sandy.	Fair: too clayey, thin layer, slope.
BoD2, BoE2----- Betts	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, too clayey.
BoF----- Betts	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BoG----- Betts	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bp----- Blendon	Good-----	Probable-----	Improbable: too sandy.	Fair: small stones.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Br----- Blyburg	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
Bs----- Boel	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy.
Bt, BtC, BtD----- Boelus	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
BvG----- Bristow	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, slope.
BwD----- Brunswick	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
BxE*: Brunswick-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Paka-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
BxF*: Brunswick-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Paka-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
By----- Butler	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Co----- Coleridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CrC2----- Crofton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
CrD2, CrE2----- Crofton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
CrF----- Crofton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CrG----- Crofton	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CsC2*: Crofton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Nora-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CsD2*, CsE2*: Crofton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Nora-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
CtD2*, CtE2*: Crofton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Thurman-----	Good-----	Probable-----	Improbable: too sandy.	Fair: too sandy, thin layer, slope.
CtF*: Crofton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Thurman-----	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: slope.
Ef----- Elsmere	Fair: wetness.	Probable-----	Improbable: too sandy.	Fair: too sandy.
Eh----- Elsmere	Fair: wetness.	Probable-----	Improbable: too sandy.	Good.
Et, EtC----- Eltree	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Fm----- Fillmore	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Fu----- Fluvaquents	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: wetness.
GaG----- Gavins	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, area reclaim, slope.
Gf----- Gibbon	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Hd----- Hobbs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ho----- Hord	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
If, Ig, Ih, Im----- Inavale	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
Ke, KzB----- Kezan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LbD----- Labu	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LcF*: Labu-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Sansarc-----	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
LhC2, LhD2----- Longford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Lk, LkC----- Loretto	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
LyF*: Lynch-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Bristow-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, slope.
LzD*: Lynch-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Verdel-----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MbF----- Mariaville	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
MeB----- Meadin	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
MgF*: Meadin-----	Fair: slope.	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
O'Neill-----	Fair: slope.	Probable-----	Probable-----	Poor: slope.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Mm, MmC----- Moody	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mo, MoC----- Moody	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
NoC----- Nora	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
NoD, NoE----- Nora	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Ob----- Obert	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Od----- Onawa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Oe, OeC----- O'Neill	Good-----	Probable-----	Probable-----	Fair: small stones, area reclaim.
Og, Oh----- Ord	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy.
Or, OrC----- Ortello	Good-----	Probable-----	Improbable: too sandy.	Fair: thin layer.
Ou----- Orwet	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: thin layer.
Ph, PhC----- Paka	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
PhD, PhE----- Paka	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Pt----- Percival	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too clayey.
RdD----- Redstoe	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer, slope.
RgF*: Redstoe-----	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Gavins-----	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, area reclaim, slope.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SaG----- Sansarc	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Sc----- Scott	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Sh----- Shell	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
SsF2----- Simeon	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: too sandy, slope.
StC, SuC----- Simeon	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
SvF*: Simeon-----	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: too sandy, slope.
Thurman-----	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: slope.
Sw----- Solomon	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
TfB, TfC, ThB, ThC, ToB, ToD----- Thurman	Good-----	Probable-----	Improbable: too sandy.	Fair: too sandy, thin layer.
ToF----- Thurman	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: slope.
Tr, Tx----- Trent	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
UbF*----- Urban land	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
VaD----- Valentine	Good-----	Probable-----	Improbable: too sandy.	Poor: area reclaim, too sandy.
VaE----- Valentine	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: area reclaim, too sandy, slope.
Ve, VeC, VeD----- Verdel	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
VfC----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
VfD----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
VfF----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
VgC----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
VgD----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
VgF----- Verdigre	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

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

TABLE 15.--WATER MANAGEMENT

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

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Aa----- Albaton	Slight-----	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ab----- Albaton	Slight-----	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
AcC----- Alcester	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.
AcD----- Alcester	Severe: slope.	Moderate: piping.	Deep to water	Slope-----	Slope, erodes easily.	Slope, erodes easily.
Ao, Ar----- Aowa	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-----	Erodes easily	Erodes easily.
Ba----- Barney	Severe: seepage.	Severe: seepage, piping, wetness.	Flooding, cutbanks cave.	Wetness, droughty.	Wetness, too sandy.	Wetness, droughty, rooting depth.
Bd----- Bazile	Severe: seepage.	Severe: seepage, piping.	Deep to water	Fast intake----	Too sandy, soil blowing.	Favorable.
BdC----- Bazile	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, fast intake.	Too sandy, soil blowing.	Favorable.
BdD----- Bazile	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, fast intake.	Slope, too sandy, soil blowing.	Slope.
Bn----- Bazile	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable-----	Too sandy-----	Favorable.
BnC----- Bazile	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope-----	Too sandy-----	Favorable.
BnD----- Bazile	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope-----	Slope, too sandy.	Slope.
BoD2, BoE2, BoF, BoG----- Betts	Severe: slope.	Moderate: piping.	Deep to water	Slope, excess salt.	Slope, erodes easily.	Slope, erodes easily.
Bp----- Blendon	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
Br----- Blyburg	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Bs----- Boel	Severe: seepage.	Severe: seepage, piping, wetness.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty, rooting depth.
Bt----- Boelus	Severe: seepage.	Moderate: piping.	Deep to water	Fast intake, soil blowing.	Erodes easily, soil blowing.	Erodes easily.
BtC----- Boelus	Severe: seepage.	Moderate: piping.	Deep to water	Slope, fast intake, soil blowing.	Erodes easily, soil blowing.	Erodes easily.
BtD----- Boelus	Severe: seepage, slope.	Moderate: piping.	Deep to water	Slope, fast intake, soil blowing.	Slope, erodes easily, soil blowing.	Slope, erodes easily.
BvG----- Bristow	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
BwD----- Brunswick	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
BxE*, BxF*: Brunswick-----	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Paka-----	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Slope-----	Slope.
By----- Butler	Moderate: seepage.	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Co----- Coleridge	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness-----	Favorable.
CrC2----- Crofton	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
CrD2, CrE2, CrF, CrG----- Crofton	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
CsC2*: Crofton-----	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Nora-----	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.
CsD2*, CsE2*: Crofton-----	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
CsD2*, CsE2*: Nora-----	Severe: slope.	Severe: piping.	Deep to water	Slope-----	Slope, erodes easily.	Slope, erodes easily.
CtD2*, CtE2*, CtF*: Crofton-----	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Thurman-----	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Ef----- Elsmere	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Eh----- Elsmere	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
Et----- Eltree	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
EtC----- Eltree	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.
Fm----- Fillmore	Moderate: seepage.	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Fu----- Fluvaquents	Severe: seepage.	Severe: ponding.	Ponding, flooding.	Ponding, rooting depth.	Ponding-----	Wetness, rooting depth.
GaG----- Gavins	Severe: seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slope, erodes easily, thin layer.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
Gf----- Gibbon	Slight-----	Severe: piping, wetness.	Flooding, frost action.	Wetness, flooding.	Wetness-----	Favorable.
Hd----- Hobbs	Moderate: seepage.	Severe: piping, hard to pack.	Deep to water	Flooding-----	Favorable-----	Favorable.
Ho----- Hord	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
If, Ig, Ih----- Inavale	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Im----- Inavale	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ke, KzB----- Kezan	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, flooding.	Wetness-----	Wetness.
LbD----- Labu	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
LcF*: Labu-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Sansarc-----	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
LhC2----- Longford	Moderate: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
LhD2----- Longford	Severe: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
Lk----- Loretto	Severe: seepage.	Moderate: piping.	Deep to water	Favorable-----	Soil blowing---	Favorable.
LkC----- Loretto	Severe: seepage.	Moderate: piping.	Deep to water	Slope-----	Soil blowing---	Favorable.
LyF*: Lynch-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Bristow-----	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
LzD*: Lynch-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Verdel-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
MbF----- Mariaville	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
MeB----- Meadin	Severe: seepage.	Severe: seepage.	Deep to water	Droughty-----	Too sandy, soil blowing.	Droughty.
MgF*: Meadin-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MgF*: O'Neill-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Mm----- Moody	Moderate: seepage.	Moderate: thin layer, piping, hard to pack.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
MmC----- Moody	Moderate: seepage, slope.	Moderate: thin layer, piping, hard to pack.	Deep to water	Slope-----	Erodes easily	Erodes easily.
Mo----- Moody	Moderate: seepage.	Moderate: thin layer, piping, hard to pack.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
MoC----- Moody	Moderate: seepage, slope.	Moderate: thin layer, piping, hard to pack.	Deep to water	Slope-----	Erodes easily	Erodes easily.
NoC----- Nora	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.
NoD, NoE----- Nora	Severe: slope.	Severe: piping.	Deep to water	Slope-----	Slope, erodes easily.	Slope, erodes easily.
Ob----- Obert	Moderate: seepage.	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding-----	Wetness.
Od----- Onawa	Severe: seepage.	Severe: piping.	Percs slowly, frost action.	Wetness, slow intake, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
Oe----- O'Neill	Severe: seepage.	Severe: seepage.	Deep to water	Droughty-----	Too sandy, soil blowing.	Droughty, rooting depth.
OeC----- O'Neill	Severe: seepage.	Severe: seepage.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
Og----- Ord	Severe: seepage.	Severe: seepage, piping, wetness.	Flooding, frost action, cutbanks cave.	Wetness, soil blowing, flooding.	Wetness, too sandy, soil blowing.	Favorable.
Oh----- Ord	Severe: seepage.	Severe: seepage, piping, wetness.	Flooding, frost action, cutbanks cave.	Wetness, flooding.	Wetness, too sandy.	Favorable.
Or----- Ortello	Severe: seepage.	Severe: seepage, piping.	Deep to water	Soil blowing---	Too sandy, soil blowing.	Favorable.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
OrC----- Ortello	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.	Favorable.
Ou----- Orwet	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness-----	Wetness, too sandy.	Wetness.
Ph----- Paka	Moderate: seepage, depth to rock.	Moderate: thin layer, piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
PhC----- Paka	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Favorable-----	Favorable.
PhD, PhE----- Paka	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Slope-----	Slope.
Pt----- Percival	Severe: seepage.	Severe: seepage, piping.	Percs slowly, cutbanks cave.	Wetness, droughty, slow intake.	Wetness, too sandy.	Droughty, percs slowly.
RdD----- Redstoe	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, thin layer.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
RgF*: Redstoe-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, thin layer.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
Gavins-----	Severe: seepage, slope.	Severe: hard to pack, thin layer.	Deep to water	Slope, erodes easily, thin layer.	Slope, area reclaim, erodes easily.	Slope, erodes easily, area reclaim.
SaG----- Sansarc	Severe: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, droughty, slow intake.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
Sc----- Scott	Moderate: seepage.	Severe: hard to pack, ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Sh----- Shell	Moderate: seepage.	Moderate: piping.	Deep to water	Flooding-----	Favorable-----	Favorable.
SsF2----- Simeon	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
StC----- Simeon	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
SuC----- Simeon	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty-----	Too sandy, soil blowing.	Droughty.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SvF*: Simeon-----	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Thurman-----	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Sw----- Solomon	Slight-----	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, droughty, slow intake.	Wetness, percs slowly.	Wetness, droughty, percs slowly.
TfB----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
TfC----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
ThB----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
ThC----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
ToB----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty-----	Too sandy, soil blowing.	Droughty.
ToD----- Thurman	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
ToF----- Thurman	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Tr----- Trent	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
Tx----- Trent	Moderate: seepage.	Slight-----	Deep to water	Favorable-----	Erodes easily	Erodes easily.
UbF*----- Urban land	Severe: slope.	Slight-----	Deep to water	Slope-----	Slope-----	Slope.
VaD----- Valentine	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty, rooting depth.
VaE----- Valentine	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Ve----- Verdel	Slight-----	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
VeC----- Verdel	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Percs slowly---	Percs slowly.
VeD----- Verdel	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
VfC----- Verdigre	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing, percs slowly.	Soil blowing, percs slowly.	Percs slowly.
VfD, VfF----- Verdigre	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing, percs slowly.	Slope, soil blowing, percs slowly.	Slope, percs slowly.
VgC----- Verdigre	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly---	Percs slowly.
VgD, VgF----- Verdigre	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.

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

TABLE 16.--ENGINEERING INDEX PROPERTIES

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

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Aa----- Albaton	0-6	Silty clay-----	CH	A-7	0	100	100	95-100	95-100	60-85	40-60
	6-60	Silty clay, clay	CH	A-7	0	100	100	95-100	95-100	60-85	40-60
Ab----- Albaton	0-60	Silty clay-----	CH	A-7	0	100	100	95-100	95-100	60-85	40-60
AcC, AcD----- Alcester	0-23	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	100	100	95-100	85-100	24-40	3-20
	23-50	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	100	100	95-100	90-100	35-50	10-25
	50-60	Silty clay loam, silt loam.	ML, CL	A-6, A-7	0	100	95-100	95-100	85-100	35-50	10-25
Ao, Ar----- Aowa	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	90-100	80-100	20-40	5-20
	7-60	Loam, silt loam, silty clay loam.	CL-ML, CL, ML	A-6, A-4, A-7	0	100	100	85-100	80-100	22-46	3-20
Ba----- Barney	0-10	Loam-----	ML, CL, CL-ML	A-4, A-6	0	90-100	90-100	85-95	60-95	20-35	3-15
	10-60	Coarse sand, sand, fine sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	90-100	85-100	30-70	3-15	---	NP
Bd, BdC, BdD----- Bazile	0-15	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	100	85-100	5-25	---	NP
	15-35	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7	0	100	100	90-100	85-95	35-45	15-25
	35-60	Sand, loamy fine sand, fine sand.	SP-SM, SP, SM	A-2, A-3	0	100	100	50-90	2-15	<20	NP
Bn, BnC, BnD----- Bazile	0-6	Loam-----	ML, CL	A-4, A-6	0	100	100	90-100	65-95	25-40	3-15
	6-30	Silty clay loam, silt loam, clay loam.	CL	A-6, A-7	0	100	100	90-100	85-95	35-45	15-25
	30-60	Sand, loamy fine sand, fine sand.	SP-SM, SP, SM	A-2, A-3	0	100	100	50-90	2-15	<20	NP
BoD2, BoE2, BoF, BoG----- Betts	0-5	Clay loam-----	CL	A-6	0-5	95-100	80-100	75-100	65-75	30-40	10-20
	5-26	Loam, clay loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
	26-60	Clay loam, loam	CL	A-6, A-7	0-5	90-100	85-100	75-100	50-85	30-45	10-25
Bp----- Blendon	0-16	Fine sandy loam	SM	A-4	0	100	90-100	60-100	35-50	20-30	NP-5
	16-30	Fine sandy loam, sandy loam.	SM, SC, SC-SM	A-4, A-2	0	100	85-100	60-100	20-45	<30	NP-10
	30-60	Fine sandy loam, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-4	0	85-100	65-100	50-100	10-45	<25	NP-5
Br----- Blyburg	0-12	Silt loam-----	ML, CL-ML	A-4	0	100	100	90-100	70-95	22-35	3-10
	12-60	Silt loam, very fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	50-90	22-35	3-12
Bs----- Boel	0-18	Loamy fine sand	SM, SP	A-2, A-3	0	100	95-100	85-95	0-35	---	NP
	18-60	Fine sand, loamy fine sand, coarse sand.	SP, SM	A-2, A-3	0	100	95-100	85-95	0-25	---	NP

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Bt, BtC, BtD----- Boelus	0-11	Loamy sand-----	SM, SP-SM	A-2	0	100	100	50-100	10-35	<20	NP
	11-24	Loamy fine sand, loamy sand, sand.	SM, SP-SM	A-2	0	100	100	50-100	10-35	<20	NP
	24-40	Silt loam, loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	80-100	30-40	8-18
	40-60	Silt loam, loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	80-100	30-40	8-18
BvG----- Bristow	0-6	Silty clay-----	CH, CL, MH	A-7	0	100	100	95-100	90-100	45-65	25-40
	6-16	Clay-----	CL, CH	A-7	0	100	100	100	95-100	45-65	25-45
	16-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
BwD----- Brunswick	0-6	Fine sandy loam	SM, SC, ML, CL	A-4	0	95-100	95-100	70-95	40-55	<25	NP-10
	6-25	Fine sandy loam, loamy very fine sand, loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0	95-100	95-100	65-95	30-65	18-35	NP-10
	25-35	Loamy fine sand, fine sand, fine sandy loam.	SM	A-2, A-4	0	95-100	95-100	65-90	20-50	---	NP
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
BxE*, BxF*: Brunswick-----	0-5	Fine sandy loam	SM, SC, ML, CL	A-4	0	95-100	95-100	70-95	40-55	<25	NP-10
	5-16	Fine sandy loam, loamy very fine sand, loam.	SM, ML, CL-ML, SC-SM	A-2, A-4	0	95-100	95-100	65-95	30-65	18-35	NP-10
	16-36	Loamy fine sand, fine sand, fine sandy loam.	SM	A-2, A-4	0	95-100	95-100	65-90	20-50	---	NP
	36-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Paka-----	0-7	Loam-----	CL	A-4, A-6	0	100	100	95-100	65-100	20-35	8-18
	7-21	Silty clay loam, clay loam, silt loam.	CL	A-6	0	100	100	95-100	80-95	30-40	15-25
	21-34	Silt loam, very fine sandy loam, silty clay loam.	CL	A-4, A-6	0	100	100	95-100	75-95	25-40	8-20
	34-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
By----- Butler	0-14	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	100	100	100	95-100	20-35	5-15
	14-60	Clay, silty clay	CH	A-7	0	100	100	100	95-100	50-70	30-45
Co----- Coleridge	0-21	Silt loam-----	CL	A-6	0	100	100	95-100	80-100	25-40	5-15
	21-45	Silty clay loam	CL	A-7, A-6	0	100	100	90-100	90-100	35-50	18-25
	45-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	90-100	80-100	30-50	14-25
CrC2, CrD2, CrE2, CrF, CrG----- Crofton	0-6	Silt loam-----	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-50	10-25
	6-60	Silt loam-----	CL	A-6, A-7	0	100	95-100	95-100	95-100	32-50	10-25
CsC2*, CsD2*, CsE2*: Crofton-----	0-7	Silt loam-----	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-50	10-25
	7-60	Silt loam-----	CL	A-6, A-7	0	100	95-100	95-100	95-100	32-50	10-25

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CsC2*, CsD2*, CsE2*: Nora-----	0-7	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	95-100	35-50	12-25
	7-18	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	95-100	95-100	95-100	85-100	35-50	11-20
	18-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	95-100	95-100	95-100	85-100	27-50	6-20
CtD2*, CtE2*, CtF*: Crofton-----	0-6	Silt loam-----	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-50	10-25
	6-60	Silt loam-----	CL	A-6, A-7	0	100	95-100	95-100	95-100	32-50	10-25
Thurman-----	0-10	Fine sandy loam	SM	A-4	0	100	100	70-100	35-50	<20	NP
	10-60	Loamy fine sand, loamy sand.	SM, SP-SM	A-2, A-3, A-4	0	100	100	90-100	5-40	<20	NP
Ef----- Elsmere	0-19	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	100	70-100	5-35	---	NP
	19-34	Loamy fine sand, loamy sand.	SP-SM, SM	A-2, A-3	0	100	100	60-100	5-30	---	NP
	34-60	Fine sand, sand	SP-SM, SM	A-2, A-3	0	100	100	60-100	5-30	---	NP
Eh----- Elsmere	0-18	Fine sandy loam	SM, SC-SM	A-4, A-2	0	100	100	70-100	30-50	<25	NP-5
	18-40	Loamy fine sand, loamy sand.	SP-SM, SM	A-2, A-3	0	100	100	60-100	5-30	---	NP
	40-60	Fine sand, sand	SP-SM, SM	A-2, A-3	0	100	100	60-100	5-30	---	NP
Et, EtC----- Eltree	0-25	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	100	85-100	65-100	20-40	3-15
	25-42	Silt loam, very fine sandy loam, loam.	CL, CL-ML	A-4, A-6	0	100	95-100	85-100	85-100	25-40	5-20
	42-60	Silt loam, loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	100	95-100	90-100	65-100	25-45	7-22
Fm----- Fillmore	0-15	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	100	100	95-100	20-40	2-20
	15-60	Silty clay, clay	CH, CL	A-7	0	100	100	100	95-100	40-75	20-45
Fu----- Fluvaquents	0-60	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	85-100	60-95	25-35	5-15
GaG----- Gavins	0-3	Silt loam-----	ML, MH, CL, CH	A-7	0	100	100	90-100	85-100	40-55	15-25
	3-12	Silt loam, loam, silty clay loam.	ML, MH	A-7	0	100	95-100	90-100	75-100	40-60	10-28
	12-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gf----- Gibbon	0-12	Silt loam-----	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	20-30	2-10
	12-29	Silty clay loam	CL	A-7	0	100	100	95-100	85-95	40-45	20-25
	29-60	Stratified very fine sandy loam to silty clay loam.	ML, CL-ML, SM, SC	A-4, A-6	0	100	100	75-95	35-95	15-35	NP-15

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Hd----- Hobbs	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	25-40	5-20
	7-35	Stratified silt loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	25-40	5-20
	35-60	Silt loam, silty clay loam, very fine sandy loam.	CL, CL-ML, MH	A-4, A-6, A-7	0	100	100	95-100	80-100	25-55	5-25
Ho----- Hord	0-17	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	100	95-100	85-100	20-35	3-18
	17-46	Silt loam, silty clay loam, loam.	CL	A-6, A-4	0	100	100	98-100	85-100	25-40	8-23
	46-60	Silt loam, very fine sandy loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	100	85-100	25-40	6-21
If----- Inavale	0-5	Fine sand-----	SM, SP-SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<25	NP-5
	5-14	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<25	NP-5
	14-60	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	100	70-90	5-30	<25	NP-5
Ig----- Inavale	0-7	Fine sand-----	SM, SP-SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<25	NP-5
	7-23	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<25	NP-5
	23-60	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	100	70-90	5-30	<25	NP-5
Ih----- Inavale	0-11	Loamy fine sand	SM, SP-SM, SC-SM	A-2, A-3	0	100	100	85-95	5-35	<25	NP-5
	11-17	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<25	NP-5
	17-60	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	100	70-90	5-30	<25	NP-5
Im----- Inavale	0-18	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4	0	100	95-100	65-85	35-55	<20	NP-5
	18-42	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	90-100	65-85	5-30	<20	NP-5
	42-60	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM, SC-SM	A-2, A-3	0	100	100	70-90	5-30	<20	NP-5
Ke----- Kezan	0-10	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	70-90	20-35	2-12
	10-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	20-40	4-20
KzB----- Kezan	0-12	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	70-90	20-35	2-12
	12-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	20-40	4-20

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LbD----- Labu	0-6	Silty clay-----	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	6-35	Silty clay, clay	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
LcF*: Labu-----	0-4	Silty clay-----	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	4-34	Silty clay, clay	CH, MH	A-7	0	100	95-100	90-100	85-100	50-85	20-50
	34-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sansarc-----	0-4	Silty clay-----	CH, MH	A-7	0	100	95-100	90-100	75-100	60-90	25-55
	4-18	Clay-----	CH, MH	A-7	0	95-100	95-100	95-100	85-100	60-90	25-55
	18-60	Weathered bedrock	CH, MH	A-7	0	100	95-100	90-100	85-100	50-90	20-55
LhC2, Lhd2----- Longford	0-6	Silty clay loam	CL	A-7	0	100	95-100	90-100	85-95	45-50	25-30
	6-28	Silty clay loam, silty clay, clay loam.	CH	A-7-6	0	100	95-100	90-100	75-95	50-60	30-40
	28-60	Clay loam, silty clay loam, loam.	CL	A-6, A-7-6	0	100	95-100	85-100	70-95	35-50	15-30
Lk, LkC----- Loretto	0-10	Fine sandy loam	SM, SC-SM	A-2, A-4	0	100	100	70-100	20-40	<25	NP-5
	10-30	Loam, silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	85-100	80-100	30-45	11-25
	30-60	Loam, silt loam, silty clay loam.	CL	A-6, A-7, A-4	0	100	100	80-100	80-100	30-47	8-25
LyF*: Lynch-----	0-5	Silty clay-----	CH	A-7	0	100	100	95-100	90-95	50-70	25-40
	5-35	Silty clay, clay	CH, MH	A-7	0	100	100	95-100	75-100	50-70	25-35
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Bristow-----	0-7	Silty clay-----	CH, CL, MH	A-7	0	100	100	95-100	90-100	45-65	25-40
	7-16	Clay-----	CL, CH	A-7	0	100	100	100	95-100	45-65	25-45
	16-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
LzD*: Lynch-----	0-5	Silty clay-----	CH	A-7	0	100	100	95-100	90-95	50-70	25-40
	5-35	Silty clay, clay	CH, MH	A-7	0	100	100	95-100	75-100	50-70	25-35
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Verdel-----	0-15	Silty clay-----	CH	A-7	0	100	95-100	95-100	85-100	50-70	27-45
	15-60	Silty clay, clay	CH	A-7	0	100	95-100	95-100	85-100	50-70	27-45
MbF----- Mariaville	0-6	Very fine sandy loam.	CL-ML, CL	A-4, A-6	0	95-100	95-100	85-100	50-95	20-35	5-15
	6-12	Very fine sandy loam, silty clay loam, silt loam.	CL-ML, CL	A-6, A-4	0	95-100	95-100	85-100	50-95	20-45	5-25
	12-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MeB----- Meadin	0-9	Sandy loam-----	SM, ML, CL-ML, SC-SM	A-2, A-4	0	85-100	75-95	45-80	25-55	<20	NP-5
	9-13	Sandy loam, very gravelly loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-3, A-2	0	50-90	50-90	50-65	5-35	---	NP
	13-60	Gravelly coarse sand, very gravelly coarse sand, gravelly sand.	SP-SM, SP, GP-GM, GP	A-1	0	40-80	30-70	15-50	1-10	---	NP
MgF*: Meadin-----	0-7	Sandy loam-----	SM, ML, CL-ML, SC-SM	A-2, A-4	0	85-100	75-95	45-80	25-55	<20	NP-5
	7-12	Sandy loam, very gravelly loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-3, A-2	0	50-90	50-90	50-65	5-35	---	NP
	12-60	Gravelly coarse sand, very gravelly coarse sand, gravelly sand.	SP-SM, SP, GP-GM, GP	A-1	0	40-80	30-70	15-50	1-10	---	NP
O'Neill-----	0-9	Sandy loam-----	SM, ML, CL, SC-SM	A-4	0	95-100	95-100	70-85	35-55	<25	NP-10
	9-24	Fine sandy loam, sandy loam.	SC, SC-SM	A-2, A-4	0	95-100	95-100	60-75	30-50	<30	4-10
	24-60	Stratified sand to gravelly sand.	SP, SP-SM	A-1, A-2, A-3	0	70-100	50-90	25-60	0-5	---	NP
Mm, MmC----- Moody	0-7	Loam-----	ML, CL	A-4, A-6	0	100	100	90-100	65-90	30-40	10-20
	7-42	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	95-100	32-55	11-30
	42-60	Silt loam-----	CL, CL-ML, ML	A-4, A-6, A-7	0	100	100	95-100	85-100	20-50	5-20
Mo, MoC----- Moody	0-7	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	95-100	35-50	13-25
	7-48	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	95-100	32-55	11-30
	48-60	Silt loam-----	CL, CL-ML, ML	A-4, A-6, A-7	0	100	100	95-100	85-100	20-50	5-20
NoC, NoD, NoE---- Nora	0-11	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	95-100	35-50	12-25
	11-22	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	95-100	95-100	95-100	85-100	35-50	11-20
	22-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	95-100	95-100	95-100	85-100	27-50	6-20
Ob----- Obert	0-10	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	20-35	7-20
	10-40	Silty clay loam, silt loam.	CL, CH, CL-CH	A-4, A-6, A-7	0	100	100	95-100	85-100	20-55	7-35
	40-60	Silty clay loam, silt loam, loam.	CL, CL-ML	A-4, A-6	0	100	100	80-100	75-95	25-45	7-25

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Od----- Onawa	0-10	Silty clay-----	CH	A-7	0	100	100	95-100	95-100	60-85	40-60
	10-25	Silty clay, clay	CH	A-7	0	100	100	95-100	95-100	60-85	40-60
	25-60	Silt loam, very fine sandy loam, loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	25-40	5-20
Oe, OeC----- O'Neill	0-9	Sandy loam-----	SM, ML, CL, SC-SM	A-4	0	95-100	95-100	70-85	35-55	<25	NP-10
	9-23	Fine sandy loam, sandy loam.	SC, SC-SM	A-2, A-4	0	95-100	95-100	60-75	30-50	<30	4-10
	23-60	Stratified sand to gravelly sand.	SP, SP-SM	A-1, A-2, A-3	0	70-100	50-90	25-60	0-5	---	NP
Og----- Ord	0-18	Fine sandy loam	ML, SM	A-2, A-4	0	95-100	95-100	70-98	30-90	20-35	NP-10
	18-23	Fine sandy loam, loamy fine sand, sandy loam.	SM, ML	A-2, A-4	0	95-100	95-100	70-100	30-85	20-35	NP-10
	23-60	Stratified sand to loamy fine sand.	SM, SP-SM, SC-SM	A-2, A-3	0	95-100	95-100	50-100	5-30	<20	NP-5
Oh----- Ord	0-14	Loam-----	ML	A-4	0	100	100	95-100	95-100	25-35	2-8
	14-24	Fine sandy loam, loamy fine sand, sandy loam.	SM, ML	A-2, A-4	0	95-100	95-100	70-100	30-85	20-35	NP-10
	24-60	Stratified sand to loamy fine sand.	SM, SP-SM, SC-SM	A-2, A-3	0	95-100	95-100	50-100	5-30	<20	NP-5
Or, OrC----- Ortello	0-14	Fine sandy loam	SM, ML	A-4	0	100	100	70-95	40-55	<20	NP
	14-40	Fine sandy loam, sandy loam.	SM, ML	A-4	0	100	100	70-95	40-55	<20	NP
	40-60	Fine sand, loamy fine sand, loamy sand.	SP-SM, SM	A-3, A-2	0	100	100	50-70	5-35	---	NP
Ou----- Orwet	0-19	Loam-----	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	85-95	60-90	22-35	3-15
	19-25	Loamy sand, fine sandy loam, sand.	SM	A-2	0	95-100	95-100	51-85	15-30	---	NP
	25-60	Sand, loamy fine sand, loamy sand.	SP-SM, SM	A-3, A-2	0	95-100	95-100	51-70	5-15	---	NP
Ph, PhC, PhD, PhE----- Paka	0-7	Loam-----	CL	A-4, A-6	0	100	100	95-100	65-100	20-35	8-18
	7-25	Silty clay loam, clay loam, silt loam.	CL	A-6	0	100	100	95-100	80-95	30-40	15-25
	25-54	Silt loam, very fine sandy loam, silty clay loam.	CL	A-4, A-6	0	100	100	95-100	75-95	25-40	8-20
	54-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Pt----- Percival	0-8	Silty clay-----	CH	A-7	0	100	100	95-100	95-100	60-85	35-60
	8-21	Silty clay, clay	CH	A-7	0	100	100	95-100	95-100	60-85	35-60
	21-60	Stratified fine sand to loamy fine sand.	SM, SC-SM, SP-SM	A-2	0	100	100	80-95	12-30	<20	NP-5

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RdD----- Redstoe	0-10	Silt loam-----	ML, MH	A-6, A-7	0	100	95-100	90-100	85-100	35-55	10-20
	10-31	Silt loam, silty clay loam.	ML, MH	A-7	0	100	100	95-100	85-100	40-55	10-20
	31-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
RgF*:											
Redstoe-----	0-10	Silt loam-----	ML, MH	A-6, A-7	0	100	95-100	90-100	85-100	35-55	10-20
	10-31	Silt loam, silty clay loam.	ML, MH	A-7	0	100	100	95-100	85-100	40-55	10-20
	31-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Gavins-----	0-4	Silt loam-----	ML, MH, CL, CH	A-7	0	100	100	90-100	85-100	40-55	15-25
	4-14	Silt loam, loam, silty clay loam.	ML, MH	A-7	0	100	95-100	90-100	75-100	40-60	10-28
	14-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
SaG----- Sansarc	0-4	Silty clay-----	CH, MH	A-7	0	100	95-100	90-100	75-100	60-90	25-55
	4-18	Clay-----	CH, MH	A-7	0	95-100	95-100	95-100	85-100	60-90	25-55
	18-60	Weathered bedrock	CH, MH	A-7	0	100	95-100	90-100	85-100	50-90	20-55
Sc----- Scott	0-9	Silt loam-----	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	100	95-100	20-45	2-20
	9-55	Silty clay, clay	CH, CL	A-7	0	100	100	100	95-100	41-75	20-45
	55-60	Silty clay loam	CL, CH	A-7, A-6	0	100	100	100	95-100	35-60	20-40
Sh----- Shell	0-24	Silt loam-----	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	6-18
	24-33	Silt loam, silty clay loam, loam.	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
	33-60	Silt loam, loam, silty clay loam.	CL	A-6	0	100	100	95-100	90-100	25-40	10-25
SsF2----- Simeon	0-5	Sand-----	SM, SP-SM	A-2, A-3	0	95-100	90-100	51-95	5-20	<20	NP
	5-60	Sand, coarse sand, loamy sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	90-100	80-100	35-95	0-30	---	NP
StC----- Simeon	0-9	Loamy sand-----	SM, SP-SM	A-2, A-3	0	95-100	90-100	51-95	5-35	<20	NP
	9-60	Sand, coarse sand, loamy sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	90-100	80-100	35-95	0-30	---	NP
SuC----- Simeon	0-9	Sandy loam-----	SM	A-2, A-4	0	95-100	90-100	60-85	30-40	<20	NP-4
	9-60	Sand, coarse sand, loamy sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	90-100	80-100	35-95	0-30	---	NP
SvF*:											
Simeon-----	0-7	Loamy sand-----	SM, SP-SM	A-2, A-3	0	95-100	90-100	51-95	5-35	<20	NP
	7-60	Sand, coarse sand, loamy sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	90-100	80-100	35-95	0-30	---	NP
Thurman-----	0-15	Fine sandy loam	SM	A-4	0	100	100	70-100	35-50	<20	NP
	15-30	Loamy fine sand, loamy sand.	SM, SP-SM	A-2, A-3, A-4	0	100	100	90-100	5-40	<20	NP
	30-60	Fine sand, sand, very fine sand.	SP-SM, SM	A-3, A-2	0	100	100	50-95	5-35	---	NP
Sw----- Solomon	0-20	Silty clay-----	CH	A-7	0	100	100	90-100	75-95	55-70	35-45
	20-60	Silty clay, clay	CH	A-7	0	100	100	90-100	75-95	55-70	35-45

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TfB, TfC----- Thurman	0-14	Fine sand-----	SP-SM, SM	A-3, A-2	0	100	100	50-95	5-35	---	NP
	14-60	Fine sand, sand, very fine sand.	SP-SM, SM	A-3, A-2	0	100	100	50-95	5-35	---	NP
ThB, ThC----- Thurman	0-14	Loamy fine sand	SM, SP-SM	A-2, A-3, A-4	0	100	100	90-100	5-40	<20	NP
	14-60	Fine sand, sand, very fine sand.	SP-SM, SM	A-3, A-2	0	100	100	50-95	5-35	---	NP
ToB, ToD, ToF---- Thurman	0-16	Fine sandy loam	SM	A-4	0	100	100	70-100	35-50	<20	NP
	16-34	Loamy fine sand, loamy sand.	SM, SP-SM	A-2, A-3, A-4	0	100	100	90-100	5-40	<20	NP
	34-60	Fine sand, sand, very fine sand.	SP-SM, SM	A-3, A-2	0	100	100	50-95	5-35	---	NP
Tr----- Trent	0-20	Silt loam-----	CL	A-6, A-4	0	100	100	90-100	80-100	30-40	8-18
	20-54	Silty clay loam	CL, CH	A-6, A-7	0	100	95-100	90-100	80-100	35-55	15-30
	54-60	Silt loam, silty clay loam.	CL	A-6, A-7, A-4	0	100	90-100	85-100	70-100	30-50	8-25
Tx----- Trent	0-17	Silt loam-----	CL, ML	A-4, A-6, A-7	0	100	100	90-100	85-100	30-45	5-20
	17-38	Silty clay loam	CL, CH	A-6, A-7	0	100	100	90-100	85-100	35-55	11-30
	38-60	Silt loam, silty clay loam.	CL, ML	A-6, A-7	0	100	95-100	90-100	70-100	35-50	10-25
UbF*----- Urban land	0-60	Variable-----	---	---	---	---	---	---	---	---	---
VaD, VaE----- Valentine	0-6	Fine sand-----	SM, SP-SM, SP	A-2, A-3	0	100	100	70-100	2-25	---	NP
	6-60	Fine sand, sand	SM, SP-SM, SP	A-2, A-3	0	100	100	70-100	2-25	---	NP
Ve, VeC, VeD----- Verdel	0-16	Silty clay-----	CH	A-7	0	100	95-100	95-100	85-100	50-70	27-45
	16-60	Silty clay, clay	CH	A-7	0	100	95-100	95-100	85-100	50-70	27-45
VfC, VfD, VfF---- Verdigre	0-15	Fine sandy loam	ML, SM, CL-ML, SC-SM	A-4	0	100	100	85-95	40-55	15-30	NP-7
	15-20	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	---	35-50	15-30
	20-36	Clay, silty clay	CH	A-7	0	95-100	95-100	90-100	85-100	55-80	35-50
	36-54	Clay, silty clay	CH	A-7	0	80-100	75-100	60-100	60-100	55-80	35-50
	54-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
VgC, VgD, VgF---- Verdigre	0-10	Loam-----	ML, CL	A-4, A-6	0	100	100	85-100	60-95	25-40	3-15
	10-25	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	---	35-50	15-30
	25-42	Clay, silty clay	CH	A-7	0	95-100	95-100	90-100	85-100	55-80	35-50
	42-56	Clay, silty clay	CH	A-7	0	80-100	75-100	60-100	60-100	55-80	35-50
	56-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

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

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

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

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
Aa----- Albaton	0-6	40-60	1.35-1.40	<0.2	0.11-0.13	7.4-8.4	<2	High-----	0.28	5	4	2-3
	6-60	50-60	1.35-1.45	<0.06	0.11-0.13	7.4-8.4	<2	High-----	0.28			
Ab----- Albaton	0-60	40-60	1.20-1.30	<0.06	0.11-0.14	7.4-8.4	<2	High-----	0.28	5	8	2-3
AcC, AcD----- Alcester	0-23	20-26	1.20-1.35	0.6-2.0	0.19-0.22	5.6-7.8	<2	Moderate	0.28	5	6	2-4
	23-50	20-32	1.20-1.35	0.6-2.0	0.19-0.22	6.1-7.8	<2	Moderate	0.28			
	50-60	20-32	1.30-1.45	0.6-2.0	0.17-0.20	6.6-8.4	<2	Moderate	0.43			
Ao, Ar----- Aowa	0-7	16-27	1.20-1.40	0.6-2.0	0.22-0.24	7.4-8.4	<2	Low-----	0.32	5	4L	2-4
	7-60	20-35	1.15-1.40	0.6-2.0	0.17-0.22	7.4-8.4	<2	Low-----	0.43			
Ba----- Barney	0-10	10-20	1.40-1.50	0.6-2.0	0.20-0.24	6.6-8.4	<2	Low-----	0.28	5	8	2-4
	10-60	0-5	1.70-1.90	>6.0	0.02-0.04	6.6-7.8	<2	Low-----	0.10			
Bd, BdC, BdD----- Bazile	0-15	2-10	1.60-1.70	6.0-20	0.06-0.11	5.1-6.5	<2	Low-----	0.17	4	2	1-2
	15-35	22-35	1.25-1.34	0.2-0.6	0.18-0.22	5.6-7.3	<2	Moderate	0.32			
	35-60	2-10	1.60-1.70	6.0-20	0.05-0.07	6.1-7.8	<2	Low-----	0.15			
Bn, BnC, BnD----- Bazile	0-6	17-27	1.35-1.45	0.6-2.0	0.20-0.24	5.1-6.5	<2	Low-----	0.32	4	6	2-4
	6-30	22-35	1.25-1.34	0.2-0.6	0.18-0.22	5.6-7.3	<2	Moderate	0.32			
	30-60	2-10	1.60-1.70	6.0-20	0.05-0.07	6.1-7.8	<2	Low-----	0.15			
BoD2, BoE2, BoF, BoG----- Betts	0-5	27-35	1.20-1.30	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.28	5	4L	1-3
	5-26	20-35	1.20-1.35	0.6-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.37			
	26-60	20-35	1.50-1.70	0.2-0.6	0.17-0.20	7.4-8.4	2-8	Moderate	0.37			
Bp----- Blendon	0-16	10-18	1.25-1.35	2.0-6.0	0.11-0.17	5.6-7.3	<2	Low-----	0.20	5	3	2-4
	16-30	10-15	1.25-1.35	2.0-6.0	0.09-0.15	6.1-8.4	<2	Low-----	0.20			
	30-60	5-18	1.30-1.45	2.0-20	0.08-0.15	6.6-8.4	<2	Low-----	0.20			
Br----- Blyburg	0-12	10-20	1.20-1.40	0.6-2.0	0.21-0.24	6.6-8.4	<2	Low-----	0.32	5	5	1-2
	12-60	10-20	1.30-1.50	0.6-2.0	0.17-0.22	7.9-8.4	<2	Low-----	0.43			
Bs----- Boel	0-18	2-10	1.60-1.80	6.0-20	0.10-0.12	6.6-8.4	<2	Low-----	0.17	5	2	1-2
	18-60	0-6	1.50-1.60	6.0-20	0.05-0.10	6.6-8.4	<2	Low-----	0.20			
Bt, BtC, BtD----- Boelus	0-11	2-12	1.50-1.70	6.0-20	0.10-0.12	5.6-7.3	<2	Low-----	0.17	5	2	1-3
	11-24	2-12	1.50-1.70	6.0-20	0.09-0.11	6.1-7.8	<2	Low-----	0.17			
	24-40	15-35	1.30-1.60	0.6-2.0	0.17-0.22	6.1-7.8	<2	Moderate	0.43			
	40-60	15-35	1.30-1.60	0.6-2.0	0.17-0.22	6.6-8.4	<2	Moderate	0.43			
BvG----- Bristow	0-6	40-65	1.20-1.40	0.06-0.2	0.10-0.12	7.4-8.4	<2	High-----	0.43	2	4	1-3
	6-16	40-65	1.20-1.40	0.06-0.2	0.08-0.10	7.4-8.4	<2	High-----	0.43			
	16-60	---	---	0.06-0.2	---	---	---	---	---			
BwD----- Brunswick	0-6	8-18	1.50-1.60	0.6-6.0	0.16-0.18	5.6-7.3	<2	Low-----	0.24	4	3	.5-1
	6-25	8-18	1.40-1.60	2.0-20	0.09-0.14	5.6-7.3	<2	Low-----	0.20			
	25-35	4-10	1.40-1.70	2.0-20	0.05-0.11	5.6-7.8	<2	Low-----	0.20			
	35-60	---	---	0.2-0.6	---	---	---	---	---			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
BxE*, BxF*: Brunswick-----	0-5	8-18	1.50-1.60	0.6-6.0	0.16-0.18	5.6-7.3	<2	Low-----	0.24	4	3	.5-1
	5-16	8-18	1.40-1.60	2.0-20	0.09-0.14	5.6-7.3	<2	Low-----	0.20			
	16-36	4-10	1.40-1.70	2.0-20	0.05-0.11	5.6-7.8	<2	Low-----	0.20			
	36-60	---	---	0.2-0.6	---	---	---	-----	---			
Paka-----	0-7	14-25	1.30-1.40	0.6-2.0	0.22-0.24	6.6-7.3	<2	Moderate	0.28	5	5	2-3
	7-21	24-35	1.40-1.60	0.2-2.0	0.18-0.20	6.6-7.8	<2	Moderate	0.32			
	21-34	10-35	1.20-1.40	0.6-2.0	0.20-0.22	7.4-8.4	<2	Moderate	0.32			
	34-60	---	---	0.06-0.2	---	---	---	-----	---			
By----- Butler	0-14	18-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-6.5	<2	Moderate	0.37	4	6	2-4
	14-60	45-55	1.10-1.20	0.06-0.2	0.11-0.13	5.6-7.8	<2	High-----	0.37			
Co----- Coleridge	0-21	20-26	1.25-1.30	0.6-2.0	0.22-0.24	5.6-7.3	<2	Moderate	0.32	5	6	1-3
	21-45	30-35	1.25-1.35	0.2-0.6	0.18-0.20	5.6-7.3	<2	Moderate	0.32			
	45-60	25-35	1.35-1.45	0.2-2.0	0.18-0.20	6.6-8.4	<2	Moderate	0.37			
CrC2, CrD2, CrE2, CrF, CrG----- Crofton	0-6	20-27	1.20-1.30	0.6-2.0	0.21-0.24	7.4-8.4	<2	Low-----	0.43	5	4L	.5-2
	6-60	15-27	1.10-1.20	0.6-2.0	0.18-0.22	7.4-8.4	<2	Low-----	0.43			
CsC2*, CsD2*, CsE2*: Crofton-----	0-7	20-27	1.20-1.30	0.6-2.0	0.21-0.24	7.4-8.4	<2	Low-----	0.43	5	4L	.5-2
	7-60	15-27	1.10-1.20	0.6-2.0	0.18-0.22	7.4-8.4	<2	Low-----	0.43			
Nora-----	0-7	27-35	1.20-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	7	2-4
	7-18	20-35	1.25-1.35	0.6-2.0	0.17-0.20	6.1-7.8	<2	Moderate	0.43			
	18-60	18-30	1.30-1.45	0.6-2.0	0.17-0.20	6.6-8.4	<2	Moderate	0.43			
CtD2*, CtE2*, CtF*: Crofton-----	0-6	20-27	1.20-1.30	0.6-2.0	0.21-0.24	7.4-8.4	<2	Low-----	0.43	5	4L	.5-2
	6-60	15-27	1.10-1.20	0.6-2.0	0.18-0.22	7.4-8.4	<2	Low-----	0.43			
Thurman-----	0-10	8-18	1.40-1.60	2.0-6.0	0.16-0.18	5.6-7.3	<2	Low-----	0.20	5	3	1-2
	10-60	5-12	1.60-1.70	6.0-20	0.08-0.10	5.6-7.3	<2	Low-----	0.17			
Ef----- Elsmere	0-19	3-10	1.55-1.70	6.0-20	0.10-0.12	5.6-8.4	<2	Low-----	0.17	5	2	1-3
	19-34	0-8	1.50-1.60	6.0-20	0.06-0.11	5.6-8.4	<2	Low-----	0.17			
	34-60	0-5	1.50-1.60	6.0-20	0.05-0.07	5.6-8.4	<2	Low-----	0.15			
Eh----- Elsmere	0-18	5-15	1.50-1.70	2.0-6.0	0.13-0.18	5.6-8.4	<2	Low-----	0.20	5	3	1-3
	18-40	0-8	1.50-1.60	6.0-20	0.06-0.11	5.6-8.4	<2	Low-----	0.17			
	40-60	0-5	1.50-1.60	6.0-20	0.05-0.07	5.6-8.4	<2	Low-----	0.15			
Et, EtC----- Eltree	0-25	12-27	1.25-1.35	0.6-2.0	0.20-0.24	6.6-8.4	<2	Low-----	0.32	5	6	1-3
	25-42	18-27	1.30-1.45	0.6-2.0	0.17-0.22	7.4-8.4	<2	Low-----	0.43			
	42-60	18-35	1.35-1.45	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low-----	0.43			
Fm----- Fillmore	0-15	18-27	1.30-1.40	0.6-2.0	0.21-0.24	5.1-6.5	<2	Low-----	0.37	3	6	3-4
	15-60	40-55	1.10-1.30	<0.06	0.11-0.14	5.6-7.8	<2	High-----	0.37			
Fu----- Fluvaquents	0-60	18-35	1.10-1.65	0.2-6.0	0.16-0.23	6.6-8.4	<2	Low-----	0.28	5	8	2-8
GaG----- Gavins	0-3	20-27	1.05-1.20	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.43	2	4L	2-4
	3-12	20-30	1.10-1.25	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.43			
	12-60	---	---	---	---	---	---	-----	---			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
Gf----- Gibbon	0-12	20-25	1.40-1.60	0.6-2.0	0.21-0.23	7.4-8.4	<2	Low-----	0.32	5	4L	2-4
	12-29	27-32	1.50-1.60	0.2-0.6	0.18-0.20	7.4-8.4	<2	Moderate	0.32			
	29-60	15-30	1.50-1.60	0.2-0.6	0.16-0.20	7.9-8.4	<2	Low-----	0.32			
Hd----- Hobbs	0-7	15-27	1.20-1.40	0.6-2.0	0.21-0.24	6.1-7.8	<2	Low-----	0.32	5	6	2-4
	7-35	15-27	1.20-1.40	0.6-2.0	0.18-0.20	6.1-7.8	<2	Low-----	0.32			
	35-60	15-30	1.20-1.40	0.6-2.0	0.18-0.22	6.6-8.4	<2	-----				
Ho----- Hord	0-17	17-27	1.30-1.40	0.6-2.0	0.20-0.24	5.6-7.3	<2	Low-----	0.32	5	6	2-4
	17-46	20-35	1.35-1.45	0.6-2.0	0.17-0.22	6.1-7.8	<2	Low-----	0.32			
	46-60	18-30	1.30-1.50	0.6-2.0	0.17-0.22	7.4-8.4	<2	Low-----	0.43			
If----- Inavale	0-5	1-5	1.50-1.60	6.0-20	0.07-0.09	5.6-7.8	<2	Low-----	0.15	5	1	.5-1
	5-14	3-10	1.50-1.60	6.0-20	0.06-0.11	5.6-7.8	<2	Low-----	0.17			
	14-60	3-10	1.50-1.60	6.0-20	0.05-0.10	5.6-7.8	<2	Low-----	0.17			
Ig----- Inavale	0-7	1-5	1.50-1.60	6.0-20	0.07-0.09	5.6-7.8	<2	Low-----	0.15	5	1	.5-1
	7-23	3-10	1.50-1.60	6.0-20	0.06-0.11	5.6-7.8	<2	Low-----	0.17			
	23-60	3-10	1.50-1.60	6.0-20	0.05-0.10	5.6-7.8	<2	Low-----	0.17			
Ih----- Inavale	0-11	2-10	1.50-1.60	6.0-20	0.10-0.12	5.6-7.8	<2	Low-----	0.17	5	2	.5-1
	11-17	3-10	1.50-1.60	6.0-20	0.06-0.11	5.6-7.8	<2	Low-----	0.17			
	17-60	3-10	1.50-1.60	6.0-20	0.05-0.10	5.6-7.8	<2	Low-----	0.17			
Im----- Inavale	0-18	7-15	1.40-1.50	2.0-6.0	0.13-0.18	5.6-7.8	<2	Low-----	0.24	5	3	.5-1
	18-42	3-10	1.50-1.60	6.0-20	0.06-0.11	5.6-7.8	<2	Low-----	0.15			
	42-60	3-10	1.50-1.60	6.0-20	0.05-0.10	5.6-7.8	<2	Low-----	0.15			
Ke----- Kezan	0-10	20-27	1.20-1.40	0.6-2.0	0.22-0.24	6.6-7.8	<2	Low-----	0.32	5	6	2-4
	10-60	20-35	1.20-1.40	0.6-2.0	0.18-0.22	6.6-8.4	<2	Low-----	0.32			
KzB----- Kezan	0-12	20-27	1.20-1.40	0.6-2.0	0.22-0.24	7.4-8.4	<2	Low-----	0.32	5	4L	2-4
	12-60	20-35	1.20-1.40	0.6-2.0	0.18-0.22	6.6-8.4	<2	Low-----	0.32			
LbD----- Labu	0-6	45-60	1.20-1.30	0.06-0.2	0.08-0.14	6.6-8.4	<2	High-----	0.32	4	4	1-3
	6-35	45-60	1.20-1.30	0.06-0.2	0.08-0.14	7.4-8.4	<2	High-----	0.32			
	35-60	---	---	0.06-0.2	---	---	---	-----				
LCF*: Labu	0-4	45-60	1.20-1.30	0.06-0.2	0.08-0.14	6.6-8.4	<2	High-----	0.32	4	4	1-3
	4-34	45-60	1.20-1.30	0.06-0.2	0.08-0.14	7.4-8.4	<2	High-----	0.32			
	34-60	---	---	0.06-0.2	---	---	---	-----				
Sansarc-----	0-4	55-65	1.10-1.20	0.06-0.2	0.08-0.12	6.6-8.4	<2	Very high	0.37	2	4	1-2
	4-18	55-65	1.10-1.20	0.06-0.2	0.06-0.12	7.4-8.4	<2	Very high	0.37			
	18-60	---	---	0.01-0.2	---	7.4-8.4	<2	-----				
LhC2, LhD2----- Longford	0-6	27-35	1.30-1.40	0.2-0.6	0.21-0.23	5.6-7.3	<2	Moderate	0.32	5	7	1-2
	6-28	35-45	1.35-1.50	0.06-0.2	0.14-0.20	5.1-7.3	<2	High-----	0.32			
	28-60	20-35	1.30-1.40	0.2-0.6	0.15-0.20	6.1-7.8	<2	Moderate	0.32			
Lk, LkC----- Loretto	0-10	8-18	1.40-1.60	2.0-6.0	0.13-0.18	5.1-6.5	<2	Low-----	0.20	5	3	1-3
	10-30	20-35	1.30-1.40	0.6-6.0	0.17-0.20	5.6-7.3	<2	Low-----	0.28			
	30-60	18-30	1.40-1.50	0.6-6.0	0.17-0.20	6.6-8.4	---	-----				
LyF*: Lynch	0-5	40-60	1.10-1.30	<0.06	0.12-0.14	7.4-8.4	<2	High-----	0.32	4	4	1-3
	5-35	45-65	1.20-1.40	<0.2	0.09-0.13	7.4-8.4	<2	High-----	0.32			
	35-60	---	---	0.06-0.2	---	---	---	-----				

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
LyF*:												
Bristow-----	0-7	40-65	1.20-1.40	0.06-0.2	0.10-0.12	7.4-8.4	<2	High-----	0.43	2	4	1-3
	7-16	40-65	1.20-1.40	0.06-0.2	0.08-0.10	7.4-8.4	<2	High-----	0.43			
	16-60	---	---	0.06-0.2	---	---	---	-----	---			
LzD*:												
Lynch-----	0-5	40-60	1.10-1.30	<0.06	0.12-0.14	7.4-8.4	<2	High-----	0.32	4	4	1-3
	5-35	45-65	1.20-1.40	<0.2	0.09-0.13	7.4-8.4	<2	High-----	0.32			
	35-60	---	---	0.06-0.2	---	---	---	-----	---			
Verdel-----	0-15	40-60	1.20-1.40	0.06-0.2	0.12-0.15	6.1-7.8	<2	High-----	0.28	5	4	1-3
	15-60	40-60	1.30-1.50	0.06-0.2	0.09-0.14	6.6-9.0	<2	High-----	0.32			
MbF-----	0-6	12-26	1.20-1.40	0.6-2.0	0.18-0.24	6.6-8.4	<2	Low-----	0.43	2	3	1-2
Mariaville	6-12	12-30	1.10-1.30	0.6-2.0	0.17-0.22	7.4-8.4	<2	Low-----	0.43			
	12-60	---	---	0.06-0.2	---	---	---	-----	---			
MeB-----	0-9	5-12	1.50-1.60	0.6-2.0	0.13-0.18	5.1-7.3	<2	Low-----	0.20	3	3	1-2
Meadin	9-13	5-18	1.50-1.60	6.0-20	0.09-0.11	5.1-7.3	<2	Low-----	0.10			
	13-60	2-5	1.50-1.70	>20	0.02-0.05	6.1-7.3	<2	Low-----	0.10			
MgF*:												
Meadin-----	0-7	5-12	1.50-1.60	0.6-2.0	0.13-0.18	5.1-7.3	<2	Low-----	0.20	3	3	1-2
	7-12	5-18	1.50-1.60	6.0-20	0.09-0.11	5.1-7.3	<2	Low-----	0.10			
	12-60	2-5	1.50-1.70	>20	0.02-0.05	6.1-7.3	<2	Low-----	0.10			
O'Neill-----	0-9	3-12	1.60-1.80	2.0-20	0.10-0.15	5.1-6.5	<2	Low-----	0.20	4	3	1-3
	9-24	6-18	1.60-1.80	2.0-6.0	0.10-0.15	5.6-7.3	<2	Low-----	0.20			
	24-60	0-3	1.50-1.70	>20	0.02-0.04	5.6-7.3	<2	Low-----	0.10			
Mm, MmC-----	0-7	15-27	1.25-1.45	0.6-2.0	0.19-0.22	5.6-7.3	<2	Moderate	0.28	5	6	2-4
Moody	7-42	27-35	1.20-1.30	0.2-0.6	0.18-0.20	6.1-7.3	<2	Moderate	0.43			
	42-60	20-27	1.20-1.30	0.6-2.0	0.19-0.21	6.6-8.4	<2	Moderate	0.43			
Mo, MoC-----	0-7	27-35	1.20-1.30	0.2-0.6	0.21-0.23	5.6-7.3	<2	Moderate	0.32	5	7	1-3
Moody	7-48	27-35	1.20-1.30	0.2-0.6	0.18-0.20	6.1-7.3	<2	Moderate	0.43			
	48-60	20-27	1.20-1.30	0.6-2.0	0.19-0.21	6.6-8.4	<2	Moderate	0.43			
NoC, NoD, NoE-----	0-11	27-35	1.20-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.32	5	7	2-4
Nora	11-22	20-35	1.25-1.35	0.6-2.0	0.17-0.20	6.1-7.8	<2	Moderate	0.43			
	22-60	18-30	1.30-1.45	0.6-2.0	0.17-0.20	6.6-8.4	<2	Moderate	0.43			
Ob-----	0-10	15-27	1.30-1.40	0.6-2.0	0.20-0.23	7.4-8.4	<2	Moderate	0.28	5	8	2-4
Obert	10-40	18-35	1.20-1.35	0.2-0.6	0.18-0.20	7.4-8.4	<2	High-----	0.32			
	40-60	18-35	1.30-1.40	0.2-2.0	0.17-0.20	7.4-8.4	<2	Moderate	0.43			
Od-----	0-10	40-55	1.30-1.35	0.2-0.6	0.12-0.14	7.4-8.4	<2	High-----	0.32	5	4	2-3
Onawa	10-25	50-60	1.30-1.40	0.06-0.2	0.12-0.14	7.4-8.4	<2	High-----	0.28			
	25-60	12-18	1.40-1.50	0.6-6.0	0.20-0.22	7.4-8.4	<2	Low-----	0.43			
Oe, OeC-----	0-9	3-12	1.60-1.80	2.0-20	0.10-0.15	5.1-6.5	<2	Low-----	0.20	4	3	1-3
O'Neill	9-23	6-18	1.60-1.80	2.0-6.0	0.10-0.15	5.6-7.3	<2	Low-----	0.20			
	23-60	0-3	1.50-1.70	>20	0.02-0.04	5.6-7.3	<2	Low-----	0.10			
Og-----	0-18	8-15	1.40-1.60	0.6-6.0	0.16-0.24	7.4-8.4	<2	Low-----	0.20	4	3	1-2
Ord	18-23	8-15	1.50-1.70	2.0-6.0	0.15-0.17	6.6-8.4	<2	Low-----	0.20			
	23-60	3-12	1.60-1.70	2.0-20	0.02-0.04	6.6-8.4	<2	Low-----	0.20			
Oh-----	0-14	8-15	1.40-1.60	0.6-2.0	0.20-0.22	7.4-8.4	<2	Low-----	0.28	4	4L	2-4
Ord	14-24	8-15	1.50-1.70	2.0-6.0	0.15-0.17	6.6-8.4	<2	Low-----	0.20			
	24-60	3-12	1.60-1.70	2.0-20	0.02-0.04	6.6-8.4	<2	Low-----	0.20			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
Or, OrC----- Ortello	0-14	5-15	1.40-1.60	2.0-6.0	0.13-0.18	5.6-7.3	<2	Low-----	0.20	5	3	1-2
	14-40	5-15	1.40-1.60	2.0-6.0	0.12-0.17	6.1-7.3	<2	Low-----	0.20			
	40-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.6-7.8	<2	Low-----	0.15			
Ou----- Orwet	0-19	10-20	1.30-1.40	0.6-2.0	0.20-0.24	7.4-8.4	<2	Low-----	0.28	3	4L	2-4
	19-25	2-10	1.50-1.70	6.0-20	0.09-0.11	6.6-8.4	<2	Low-----	0.15			
	25-60	2-10	1.50-1.70	6.0-20	0.05-0.07	6.6-7.3	<2	Low-----	0.15			
Ph, PhC, PhD, PhE----- Paka	0-7	14-25	1.30-1.40	0.6-2.0	0.22-0.24	6.6-7.3	<2	Moderate	0.28	5	5	2-3
	7-25	24-35	1.40-1.60	0.2-2.0	0.18-0.20	6.6-7.8	<2	Moderate	0.32			
	25-54	10-35	1.20-1.40	0.6-2.0	0.20-0.22	7.4-8.4	<2	Moderate	0.32			
	54-60	---	---	0.06-0.2	---	---	---	---	---			
Pt----- Percival	0-8	40-60	1.30-1.35	0.06-0.2	0.10-0.12	7.4-8.4	<2	High-----	0.28	4	4	1-3
	8-21	40-60	1.30-1.35	0.06-0.2	0.10-0.12	7.4-8.4	<2	High-----	0.28			
	21-60	2-12	1.30-1.50	6.0-20	0.02-0.04	7.4-8.4	<2	Low-----	0.15			
RdD----- Redstoe	0-10	18-26	1.10-1.25	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.28	4	4L	1-3
	10-31	18-35	1.15-1.25	0.6-2.0	0.13-0.17	6.6-8.4	<2	Low-----	0.43			
	31-60	---	---	0.06-0.6	---	---	---	---	---			
RgF*: Redstoe-----	0-10	18-26	1.10-1.25	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.28	4	4L	1-3
	10-31	18-35	1.15-1.25	0.6-2.0	0.13-0.17	6.6-8.4	<2	Low-----	0.43			
	31-60	---	---	0.06-0.6	---	---	---	---	---			
Gavins----- Gavins	0-4	20-27	1.05-1.20	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.43	2	4L	2-4
	4-14	20-30	1.10-1.25	0.6-2.0	0.15-0.19	6.6-8.4	<2	Low-----	0.43			
	14-60	---	---	---	---	---	---	---	---			
SaG----- Sansarc	0-4	55-65	1.10-1.20	0.06-0.2	0.08-0.12	6.6-8.4	<2	Very high	0.37	2	4	1-2
	4-18	55-65	1.10-1.20	0.06-0.2	0.06-0.12	7.4-8.4	<2	Very high	0.37			
	18-60	---	---	0.01-0.2	---	7.4-8.4	<2	---	---			
Sc----- Scott	0-9	15-27	1.25-1.40	0.6-2.0	0.21-0.24	5.6-7.3	<2	Low-----	0.37	3	6	2-4
	9-55	40-55	1.20-1.40	<0.06	0.08-0.16	6.1-7.8	<2	High-----	0.37			
	55-60	27-40	1.15-1.40	0.2-0.6	0.18-0.20	6.6-7.8	<2	High-----	0.37			
Sh----- Shell	0-24	15-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.3	<2	Low-----	0.32	5	6	2-4
	24-33	20-30	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.3	<2	Low-----	0.32			
	33-60	20-30	1.20-1.30	0.6-2.0	0.20-0.22	6.1-7.8	<2	Low-----	0.32			
SsF2----- Simeon	0-5	3-10	1.30-1.50	6.0-20	0.06-0.12	6.1-7.8	<2	Low-----	0.15	5	1	.5-1
	5-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	<2	Low-----	0.15			
StC----- Simeon	0-9	5-12	1.30-1.50	6.0-20	0.08-0.14	6.1-7.8	<2	Low-----	0.17	5	2	.5-1
	9-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	<2	Low-----	0.15			
SuC----- Simeon	0-9	6-18	1.30-1.50	2.0-6.0	0.13-0.15	6.1-7.8	<2	Low-----	0.24	5	3	.5-1
	9-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	<2	Low-----	0.15			
SvF*: Simeon-----	0-7	5-12	1.30-1.50	6.0-20	0.08-0.14	6.1-7.8	<2	Low-----	0.17	5	2	.5-1
	7-60	2-10	1.50-1.70	6.0-20	0.05-0.10	6.1-7.8	<2	Low-----	0.15			
Thurman----- Thurman	0-15	8-18	1.40-1.60	2.0-6.0	0.16-0.18	5.6-7.3	<2	Low-----	0.20	5	3	1-2
	15-30	5-12	1.60-1.70	6.0-20	0.08-0.10	5.6-7.3	<2	Low-----	0.17			
	30-60	2-7	1.60-1.70	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
Sw----- Solomon	0-20	40-55	1.35-1.45	<0.06	0.12-0.14	7.4-8.4	<2	High-----	0.28	5	4L	2-4
	20-60	40-55	1.35-1.45	<0.06	0.08-0.12	7.9-9.0	<2	High-----	0.28			
TfB, TfC----- Thurman	0-14	2-7	1.60-1.70	6.0-20	0.07-0.09	5.6-7.3	<2	Low-----	0.15	5	1	1-2
	14-60	2-7	1.60-1.70	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
ThB, ThC----- Thurman	0-14	5-12	1.60-1.70	6.0-20	0.10-0.12	5.6-7.3	<2	Low-----	0.17	5	2	1-2
	14-60	2-7	1.60-1.70	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
ToB, ToD, ToF---- Thurman	0-16	8-18	1.40-1.60	2.0-6.0	0.16-0.18	5.6-7.3	<2	Low-----	0.20	5	3	1-2
	16-34	5-12	1.60-1.70	6.0-20	0.08-0.10	5.6-7.3	<2	Low-----	0.17			
	34-60	2-7	1.60-1.70	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
Tr----- Trent	0-20	20-26	1.10-1.25	0.6-2.0	0.17-0.20	5.6-7.3	<2	Moderate	0.28	5	6	4-6
	20-54	27-35	1.20-1.35	0.6-2.0	0.17-0.20	6.1-7.3	<2	Moderate	0.43			
	54-60	25-33	1.25-1.40	0.6-2.0	0.17-0.20	6.6-8.4	<2	Moderate	0.43			
Tx----- Trent	0-17	20-27	1.10-1.25	0.6-2.0	0.19-0.22	6.1-7.3	<2	Moderate	0.28	5	6	4-6
	17-38	27-35	1.20-1.35	0.6-2.0	0.17-0.20	6.1-7.8	<2	Moderate	0.43			
	38-60	25-35	1.25-1.40	0.6-2.0	0.17-0.20	6.6-8.4	<2	Moderate	0.43			
UbF*----- Urban land	0-60	---	---	0.06-6.0	---	---	<2	-----	---	---	8	---
VaD, VaE----- Valentine	0-6	0-6	1.70-1.90	6.0-20	0.07-0.09	5.6-7.3	<2	Low-----	0.15	5	1	.5-1
	6-60	0-6	1.70-1.90	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
Ve, VeC, VeD---- Verdel	0-16	40-60	1.20-1.40	0.06-0.2	0.12-0.15	6.1-7.8	<2	High-----	0.28	5	4	1-3
	16-60	40-60	1.30-1.50	0.06-0.2	0.09-0.14	6.6-9.0	<2	High-----	0.32			
VfC, VfD, VfF---- Verdigre	0-15	8-20	1.30-1.50	2.0-6.0	0.13-0.18	5.6-7.3	<2	Low-----	0.20	5	3	2-4
	15-20	20-35	1.30-1.65	0.2-0.6	0.17-0.20	5.6-7.3	<2	Moderate	0.32			
	20-36	45-60	1.20-1.40	0.06-0.2	0.10-0.16	6.6-8.4	<2	High-----	0.32			
	36-54	45-60	1.20-1.40	0.06-0.2	0.08-0.12	6.6-8.4	<2	High-----	0.28			
	54-60	---	---	0.06-0.2	---	---	---	-----	---			
VgC, VgD, VgF---- Verdigre	0-10	18-27	1.35-1.45	0.6-2.0	0.20-0.23	5.6-7.3	<2	Low-----	0.28	5	6	2-4
	10-25	20-35	1.30-1.65	0.2-0.6	0.17-0.20	5.6-7.3	<2	Moderate	0.32			
	25-42	45-60	1.20-1.40	0.06-0.2	0.10-0.16	6.6-8.4	<2	High-----	0.32			
	42-56	45-60	1.20-1.40	0.06-0.2	0.08-0.12	6.6-8.4	<2	High-----	0.28			
	56-60	---	---	0.06-0.2	---	---	---	-----	---			

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

TABLE 18.--SOIL AND WATER FEATURES

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

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion		
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete	
					Ft						In		
Aa----- Albaton	D	Occasional	Brief-----	Feb-Nov	1.0-3.0	Apparent	Nov-Jul	>60	---	Moderate	High-----	Low.	
Ab----- Albaton	D	Frequent---	Very long	Nov-Jun	+5-2.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.	
AcC, AcD----- Alcester	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.	
Ao----- Aowa	B	Occasional	Very brief	Apr-Jun	>6.0	---	---	>60	---	High-----	Moderate	Low.	
Ar----- Aowa	B	Frequent---	Very brief	Apr-Jun	>6.0	---	---	>60	---	High-----	Moderate	Low.	
Ba----- Barney	D	Frequent---	Long-----	Mar-Jun	0-2.0	Apparent	Nov-Jun	>60	---	Moderate	High-----	Low.	
Bd, BdC, BdD, Bn, BnC, BnD----- Bazile	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Low-----	Low.	
BoD2, BoE2, BoF, BoG----- Betts	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.	
Bp----- Blendon	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.	
Br----- Blyburg	B	Rare-----	---	---	>6.0	---	---	>60	---	High-----	Low-----	Low.	
Bs----- Boel	A	Occasional	Brief-----	Mar-Jun	1.5-3.5	Apparent	Nov-May	>60	---	Moderate	High-----	Low.	
Bt, BtC, BtD----- Boelus	A	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.	
BvG----- Bristow	D	None-----	---	---	>6.0	---	---	10-20	Soft	Moderate	High-----	Moderate.	
BwD----- Brunswick	B	None-----	---	---	>6.0	---	---	20-40	Soft	Moderate	High-----	Low.	

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>				
BxE*, BxF*: Brunswick-----	B	None-----	---	---	>6.0	---	---	20-40	Soft	Moderate	High-----	Low.
Paka-----	B	None-----	---	---	>6.0	---	---	40-60	Soft	Moderate	High-----	Low.
By----- Butler	D	None-----	---	---	0.5-3.0	Perched	Mar-Jul	>60	---	High-----	High-----	Low.
Co----- Coleridge	C	Occasional	Very brief or brief.	Mar-Oct	1.5-3.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Moderate.
CrC2, CrD2, CrE2, CrF, CrG----- Crofton	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Low.
CsC2*, CsD2*, CsE2*: Crofton-----	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Low.
Nora-----	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.
CtD2*, CtE2*, CtF*: Crofton-----	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Low.
Thurman-----	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
Ef, Eh----- Elsmere	A	Rare-----	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	Low.
Et, EtC----- Eltree	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Low.
Fm----- Fillmore	D	None-----	---	---	0-1.0	Perched	Mar-Sep	>60	---	High-----	High-----	Low.
Fu----- Fluvaquents	D	Frequent---	Brief to very long.	Nov-Jun	+2-1.0	Apparent	Jan-Dec	>60	---	Moderate	High-----	Low.
GaG----- Gavins	D	None-----	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	High.
Gf----- Gibbon	B	Occasional	Very brief	Mar-Jul	1.5-3.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>				
Hd----- Hobbs	B	Occasional	Brief-----	Apr-Sep	>6.0	---	---	>60	---	Moderate	Low-----	Low.
Ho----- Hord	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
If----- Inavale	A	Rare-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate	Low.
Ig----- Inavale	A	Frequent---	Very brief	Jan-Jul	>6.0	---	---	>60	---	Low-----	Moderate	Low.
Ih, Im----- Inavale	A	Rare-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate	Low.
Ke----- Kezan	D	Occasional	Brief-----	Mar-Jul	1.0-3.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
KzB----- Kezan	D	Frequent---	Brief-----	Mar-Jul	1.0-3.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
LbD----- Labu	D	None-----	---	---	>6.0	---	---	20-40	Soft	Low-----	High-----	Moderate.
LcF*: Labu-----	D	None-----	---	---	>6.0	---	---	20-40	Soft	Low-----	High-----	Moderate.
Sansarc-----	D	None-----	---	---	>6.0	---	---	4-20	Soft	Low-----	High-----	Moderate.
LhC2, LhD2----- Longford	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
Lk, LkC----- Loretto	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Low.
LyF*: Lynch-----	D	None-----	---	---	>6.0	---	---	20-40	Soft	Low-----	High-----	High.
Bristow-----	D	None-----	---	---	>6.0	---	---	10-20	Soft	Moderate	High-----	Moderate.
LzD*: Lynch-----	D	None-----	---	---	>6.0	---	---	20-40	Soft	Low-----	High-----	High.
Verdel-----	D	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
MbF----- Mariaville	D	None-----	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	Low.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>				
MeB----- Meadin	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Moderate.
MgF*: Meadin	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Moderate.
O'Neill-----	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Mm, MmC, Mo, MoC-- Moody	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.
NoC, NoD, NoE----- Nora	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.
Ob----- Obert	C	Occasional	Very brief or brief.	Mar-Oct	+5-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
Od----- Onawa	D	Rare-----	---	---	2.0-4.0	Apparent	Nov-Jul	>60	---	High-----	High-----	Low.
Oe, OeC----- O'Neill	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Og, Oh----- Ord	B	Occasional	Brief-----	Mar-May	1.5-3.5	Apparent	Nov-May	>60	---	High-----	High-----	Low.
Or, OrC----- Ortello	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Ou----- Orwet	A/D	Rare-----	---	---	1.0-3.0	Apparent	Nov-May	>60	---	Moderate	High-----	Moderate.
Ph, PhC, PhD, PhE- Paka	B	None-----	---	---	>6.0	---	---	40-60	Soft	Moderate	High-----	Low.
Pt----- Percival	C	Rare-----	---	---	2.0-4.0	Apparent	Nov-Jul	>60	---	Moderate	High-----	Low.
RdD----- Redstoe	B	None-----	---	---	>6.0	---	---	20-40	Soft	Moderate	High-----	Moderate.
RgF*: Redstoe-----	B	None-----	---	---	>6.0	---	---	20-40	Soft	Moderate	High-----	Moderate.
Gavins-----	D	None-----	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	High.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>				
SaG----- Sansarc	D	None-----	---	---	>6.0	---	---	4-20	Soft	Low-----	High-----	Moderate.
Sc----- Scott	D	None-----	---	---	+1-1.0	Perched	Mar-Aug	>60	---	High-----	High-----	Low.
Sh----- Shell	B	Occasional	Brief-----	Mar-Jun	>6.0	---	---	>60	---	Moderate	Low-----	Low.
SsF2, StC, SuC---- Simeon	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
SvF*: Simeon-----	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
Thurman-----	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
Sw----- Solomon	D	Occasional	Brief or long.	Nov-May	0-2.0	Apparent	Dec-May	>60	---	Moderate	High-----	Low.
TfB, TfC, ThB, ThC, ToB, ToD, ToF----- Thurman	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
Tr----- Trent	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.
Tx----- Trent	B	None-----	---	---	3.5-6.0	Perched	Oct-Jun	>60	---	High-----	High-----	Moderate.
UbF*----- Urban land	D	None-----	---	---	>6.0	---	---	>60	---	---	---	---
VaD, VaE----- Valentine	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Low.
Ve, VeC, VeD----- Verdel	D	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
VfC, VfD, VfF, VgC, VgD, VgF---- Verdigre	C	None-----	---	---	>6.0	---	---	40-60	Soft	Moderate	High-----	Moderate.

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

TABLE 19.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. LL means liquid limit; PI, plasticity index; and NP, nonplastic)

Soil name, report number, horizon, and depth in inches	Classifi- cation		Grain-size distribution									LL	PI	Specific gravity
			Percentage passing sieve--						Percentage smaller than--					
			AASHTO	Uni- fied	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.05 mm			
												Pct		
Alcester silt loam: (S84NE-107-4)														
Ap----- 0 to 7	A-6(10)	CL	---	---	---	---	---	95	85	---	27	38	15	2.60
A2----- 10 to 23	A-7-6(11)	CL	---	---	---	---	---	95	86	---	26	41	17	2.66
Bw1----- 23 to 36	A-6(11)	CL	---	---	---	---	---	95	87	---	27	40	18	2.66
Bk----- 50 to 60	A-7-6(14)	CL	---	---	---	100	99	97	91	---	32	43	23	2.67
Bristow silty clay: (S74NE-107-13)														
A1----- 0 to 3	A-7-5(20)	MH	100	98	96	95	94	90	90	64	49	64	28	2.65
Cr----- 16 to 60	A-7-5(18)	MH	---	---	---	100	98	88	86	66	47	58	26	2.91
Crofton silt loam: (S77NE-107-4)														
Ap----- 0 to 6	A-6(9)	CL	---	---	---	---	99	98	90	29	22	37	13	2.72
C1----- 6 to 18	A-6(9)	CL	---	---	---	---	100	98	92	28	20	36	13	2.73
C3----- 38 to 60	A-4(8)	ML	---	---	---	---	---	98	89	22	16	32	8	2.72
Labu silty clay: (S74NE-107-12)														
A----- 0 to 4	A-7-5(22)	MH	---	100	99	97	94	90	86	50	39	69	31	2.63
Bw2----- 8 to 16	A-7-5(30)	CH	---	---	---	100	98	95	95	78	64	82	45	2.71
C----- 25 to 34	A-7-5(32)	CH	---	---	---	---	---	99	99	88	73	89	55	2.74
Lynch silty clay: (S75NE-107-4)														
Ap----- 0 to 5	A-7-5(15)	MH	---	---	---	100	99	96	94	55	39	52	21	2.69
BC----- 12 to 20	A-7-5(23)	MH	---	---	---	---	---	99	99	80	64	67	34	2.73
Simeon sand: (S76NE-107-14)														
A----- 0 to 5	A-2-4(0)	SM	---	100	99	97	87	14	10	6	4	NP	NP	2.65
AC----- 5 to 13	A-3(0)	SP-SM	---	100	99	97	86	9	8	4	3	NP	NP	2.65
C1----- 13 to 50	A-3(0)	SP-SM	---	---	---	100	89	6	5	3	3	NP	NP	2.64

See footnotes at end of table.

TABLE 19.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classifi- cation		Grain-size distribution									LL	PI	Specific gravity
			Percentage passing sieve--						Percentage smaller than--					
			AASHTO	Uni- fied	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.05 mm			
											Pct			
Trent silt loam: (S84NE-107-9)														
Ap----- 0 to 8	A-6(9)	CL	---	---	100	99	96	87	79	---	23	36	12	2.59
Bw1----- 20 to 32	A-7-6(14)	CL	---	---	---	---	99	95	92	---	32	44	23	2.66
Bw2----- 32 to 45	A-7-6(17)	CL	---	---	---	---	99	97	93	---	37	49	28	2.64
C----- 54 to 60	A-7-6(17)	CL	---	---	---	---	99	96	92	---	34	49	29	2.64

* Locations of the sampled pedons are as follows:

- Alcester silt loam, 820 feet south and 270 feet west of the northeast corner of sec. 21, T. 32 N., R. 3 W.
- Bristow silty clay, 930 feet east and 100 feet north of the southwest corner of sec. 33, T. 33 N., R. 7 W.
- Crofton silt loam, 210 feet south and 290 feet east of the northwest corner of sec. 10, T. 31 N., R. 4 W.
- Labu silty clay, 630 feet south and 90 feet east of the northwest corner of sec. 9, T. 32 N., R. 5 W.
- Lynch silty clay, 480 feet north and 210 feet west of the southeast corner of sec. 8, T. 33 N., R. 8 W.
- Simeon sand, 1,000 feet south and 330 feet west of the center of sec. 11, T. 31 N., R. 7 W.
- Trent silt loam, 1,300 feet west and 1,850 feet north of the southeast corner of sec. 1, T. 29 N., R. 6 W.

TABLE 20.--CLASSIFICATION OF THE SOILS

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

Soil name	Family or higher taxonomic class
Albaton-----	Fine, montmorillonitic (calcareous), mesic Vertic Fluvaquents
Alcester-----	Fine-silty, mixed, mesic Cumulic Haplustolls
Aowa-----	Fine-silty, mixed (calcareous), mesic Mollic Ustifluvents
Barney-----	Sandy, mixed, mesic Mollic Fluvaquents
Bazile-----	Fine-silty over sandy or sandy-skeletal, mixed, mesic Udic Argiustolls
Betts-----	Fine-loamy, mixed (calcareous), mesic Typic Ustorthents
Blendon-----	Coarse-loamy, mixed, mesic Pachic Haplustolls
*Blyburg-----	Coarse-silty, mixed, mesic Fluventic Hapludolls
Boel-----	Sandy, mixed, mesic Fluvaquentic Haplustolls
Boelus-----	Sandy over loamy, mixed, mesic Udic Haplustolls
Bristow-----	Clayey, gypsic, mesic, shallow Typic Ustorthents
Brunswick-----	Coarse-loamy, mixed, mesic Udic Ustochrepts
Butler-----	Fine, montmorillonitic, mesic Abruptic Argiaquolls
Coleridge-----	Fine-silty, mixed, mesic Cumulic Haplustolls
Crofton-----	Fine-silty, mixed (calcareous), mesic Typic Ustorthents
Elsmere-----	Sandy, mixed, mesic Aquic Haplustolls
Eltree-----	Fine-silty, mixed, mesic Pachic Haplustolls
Fillmore-----	Fine, montmorillonitic, mesic Typic Argialbolls
Fluvaquents-----	Fluvaquents
Gavins-----	Loamy, carbonatic, mesic, shallow Typic Ustorthents
*Gibbon-----	Fine-silty, mixed (calcareous), mesic Fluvaquentic Haplaquolls
Hobbs-----	Fine-silty, mixed, nonacid, mesic Mollic Ustifluvents
Hord-----	Fine-silty, mixed, mesic Cumulic Haplustolls
Inavale-----	Sandy, mixed, mesic Typic Ustifluvents
*Kezan-----	Fine-silty, mixed, nonacid, mesic Mollic Fluvaquents
Labu-----	Fine, montmorillonitic, mesic Vertic Ustochrepts
*Longford-----	Fine, montmorillonitic, mesic Udic Argiustolls
Loretto-----	Fine-loamy, mixed, mesic Udic Argiustolls
Lynch-----	Fine, mixed, mesic Typic Ustochrepts
Mariaville-----	Loamy, mixed (calcareous), mesic, shallow Typic Ustorthents
Meadin-----	Sandy, mixed, mesic Entic Haplustolls
Moody-----	Fine-silty, mixed, mesic Udic Haplustolls
Nora-----	Fine-silty, mixed, mesic Udic Haplustolls
Obert-----	Fine-silty, mixed (calcareous), mesic Cumulic Haplaquolls
Onawa-----	Clayey over loamy, montmorillonitic (calcareous), mesic Aquic Udifluvents
O'Neill-----	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplustolls
*Ord-----	Coarse-loamy over sandy or sandy-skeletal, mesic Aeric Calcicquolls
Ortello-----	Coarse-loamy, mixed, mesic Udic Haplustolls
Orwet-----	Sandy, mesic Typic Calcicquolls
Paka-----	Fine-silty, mixed, mesic Typic Argiustolls
Percival-----	Clayey over sandy or sandy-skeletal, montmorillonitic (calcareous), mesic Aquic Udifluvents
Redstoe-----	Fine-silty, mixed, mesic Typic Calcicquolls
Sansarc-----	Clayey, montmorillonitic (calcareous), mesic, shallow Typic Ustorthents
Scott-----	Fine, montmorillonitic, mesic Typic Argialbolls
Shell-----	Fine-silty, mixed, mesic Cumulic Haplustolls
Simeon-----	Mixed, mesic Typic Ustipsamments
Solomon-----	Fine, montmorillonitic (calcareous), mesic Vertic Haplaquolls
Thurman-----	Sandy, mixed, mesic Udorthentic Haplustolls
Trent-----	Fine-silty, mixed, mesic Pachic Haplustolls
Valentine-----	Mixed, mesic Typic Ustipsamments
Verdel-----	Fine, montmorillonitic, mesic Vertic Haplustolls
Verdigre-----	Fine-loamy, mixed, mesic Typic Argiustolls