3 inches thick and an A2 horizon 3 to 8 inches thick. The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is silty clay, clay, silty clay loam, or clay loam. The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is silty clay loam or clay loam and is mildly alkaline or moderately alkaline.

Fitchville series

The Fitchville series consists of deep, somewhat poorly drained, moderately slowly permeable soils. These soils formed in lacustrine deposits on terraces and in basins of former glacial lakes. Slopes range from 0 to 6 percent.

Fitchville soils are commonly adjacent to Glenford and Sebring soils and are similar to Caneadea, Platea, and Wadsworth soils. Glenford soils are moderately well drained and have less gray in the subsoil. Sebring soils are poorly drained and have more gray in the subsoil. Caneadea soils have more clay in the subsoil and substratum. Platea and Wadsworth soils formed in glacial till and have a fragipan.

Typical pedon of Fitchville silt loam, 0 to 2 percent slopes, 4.2 miles south of Burton, in Troy Township, 550 yards south along Rapids Road from its intersection with Stafford Road, then 120 yards east:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

B&A—7 to 15 inches; 85 percent yellowish brown (10YR 5/4) silt loam (B2t); common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common roots; 15 percent thick continuous light brownish gray (10YR 6/2) silt loam (A2); few fine very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); very strongly acid; clear wavy boundary.

B21t—15 to 23 inches; yellowish brown (10YR 5/6) silty clay loam; many medium distinct light brownish gray (10YR 6/2) and common fine faint yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few roots; thin patchy gray (10YR 5/1) clay films and thin very patchy light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); very strongly acid; clear wavy boundary.

B22t—23 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; many medium distinct yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; gray (10YR 5/1) coatings on faces of peds; thin patchy clay films on faces of peds; common medium black (10YR 2/1) stains and concretions (iron and manganese oxides); strongly acid; gradual wavy boundary.

B23t—34 to 46 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; gray (10YR 5/1) coatings on faces of peds; thin patchy clay films on faces of peds; common medium black (10YR 2/1) stains and concretions (iron and manganese oxides); strongly acid; gradual wavy boundary.

B3—46 to 59 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and gray (10YR 6/1) mottles; weak coarse prismatic structure; friable; laminated; thin grayish brown (10YR 5/2) coatings mainly on vertical faces of peds; thin very patchy clay films on vertical faces of peds; common medium dark brown (7.5YR 3/2) stains and concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

C—59 to 69 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; laminated; neutral.

The solum is 30 to 60 inches thick. Pedons commonly do not have coarse fragments, although the C horizon is as much as 5 percent by volume.

The Ap horizon has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2. Some pedons have an A1 horizon 1 to 4 inches thick and have an A2 horizon. The A horizon is very strongly acid to medium acid, except where lime has been added. The Bt horizon has hue of 2.5Y to 7.5YR, value of 4 to 6, and chroma of 2 to 6. It is silt loam or silty clay loam and is very strongly acid to medium acid. The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is laminated or stratified and commonly is silt loam or silty clay loam. Thin lenses of loam or fine sandy loam are in some pedons. Reaction ranges from medium acid to mildly alkaline.

Geeburg series

The Geeburg series consists of deep, moderately well drained, very slowly permeable soils that formed in glacial till on uplands. Slopes range from 2 to 12 percent.

Geeburg soils are similar to Ellsworth and Rittman soils. Ellsworth and Rittman soils have less clay in the subsoil and substratum, and Rittman soils have a fragipan.

Typical pedon of Geeburg silt loam, 2 to 6 percent slopes, about 3 miles southeast of Parkman, in Parkman Township, 1,045 yards west along Bradford Road from its intersection with Hobart Road, then 360 yards south:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; friable; many roots; 2 percent coarse fragments; neutral; abrupt smooth boundary.

B1—7 to 10 inches; yellowish brown (10YR 5/4) silty clay loam; common medium faint yellowish brown (10YR 5/6 and 5/8) mottles; weak fine and medium subangular blocky structure; firm; common roots; brown (10YR 4/3) organic stains on faces of peds; 2 percent coarse fragments; strongly acid; clear smooth boundary.

B21t—10 to 13 inches; dark yellowish brown (10YR 4/4) silty clay; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common roots; grayish brown (2.5Y 5/4) clay films that are thin continuous on vertical faces of peds and thin patchy on horizontal faces; 2 percent coarse fragments; very strongly acid; clear wavy boundary.

B22t—13 to 19 inches; dark yellowish brown (10YR 4/4) silty clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular and subangular blocky; firm; common roots; thin continuous grayish brown (2.5Y 5/2) clay films on vertical faces of peds and thin patchy brown (10YR 4/3) clay films on horizontal faces; 3 percent coarse fragments; very strongly acid; clear wavy boundary.

B23t—19 to 30 inches; dark yellowish brown (10YR 4/4) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium and coarse angular and subangular blocky; firm; few roots; thin continuous grayish brown (2.5Y 5/2) clay films on vertical faces of peds and thin patchy brown (10YR 4/3) clay films on horizontal faces; few fine very dark brown (10YR 2/2) stains (iron and manganese oxides); 2 percent coarse fragments; neutral; clear wavy boundary.

C1—30 to 42 inches; dark yellowish brown (10YR 4/4) silty clay; massive with vertical partings; firm; gray (10YR 6/1) coatings in vertical partings; common white (2.5Y 8/2) calcium carbonate splotches; common fine and medium dark brown (7.5YR 3/2) stains (iron and manganese oxides); 2 percent coarse fragments; slight effervescence; mildly alkaline; diffuse wavy boundary.

C2—42 to 60 inches; yellowish brown (10YR 5/4) silty clay; common medium faint yellowish brown (10YR 5/6) mottles; massive with vertical partings; firm; grayish brown (2.5Y 5/2) coatings in partings; common white (2.5Y 8/2) calcium carbonate splotches; few fine distinct dark brown (7.5YR 3/2) stains (iron and manganese oxides); 3 percent coarse fragments; slight effervescence; mildly alkaline.

The solum is 20 to 40 inches thick. The content of coarse fragments, mainly shale and sandstone, is less than 5 percent by volume throughout the soil.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 4 inches thick. The A horizon is strongly acid or very strongly acid, except where lime has been added. The B2t horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 5. It is silty clay or clay. Reaction is strongly acid or very strongly acid in the upper part of the B2t horizon and medium acid to mildly alkaline in the lower part. The C horizon is clay or silty clay and is mildly alkaline or moderately alkaline.

Glenford series

The Glenford series consists of deep, moderately well drained, moderately slowly permeable soils. These soils formed in glaciolacustrine or stream-deposited material on lake plains and terraces. Slopes range from 2 to 12 percent.

Glenford soils are commonly adjacent to Fitchville and Sebring soils and are similar to Ellsworth soils. Fitchville and Sebring soils are wetter and are more gray in the subsoil. Ellsworth soils formed in glacial till and have more clay and coarse fragments in the subsoil and substratum.

Typical pedon of Glenford silt loam, 2 to 6 percent slopes, about 4 miles south of Chardon, in Munson Township, 1,680 yards west along U.S. Route 322 from its intersection with Bass Lake Road, then 16 yards north:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; friable; many roots; 2 percent small pebbles; neutral; abrupt smooth boundary.

B1—8 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; common roots; grayish brown (10YR 5/2) organic stains along root channels; 3 percent small pebbles; medium acid; clear wavy boundary.

B21t—12 to 16 inches; yellowish brown (10YR 5/4) silt loam; few medium faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; common roots; thin patchy dark brown (7.5YR 4/4) clay films in pores and root channels; few medium grayish brown (10YR 5/2) organic stains along root channels; strongly acid; clear wavy boundary.

B22t—16 to 21 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/8) and common coarse distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium platy; friable; few roots; thin patchy dark brown (7.5YR 4/4) clay films on faces of peds and in voids; strongly acid; clear wavy boundary.

B23t—21 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; many coarse prominent light brownish gray (10YR 6/2) and common medium distinct strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium platy; firm; thin very patchy dark brown (7.5YR 4/4) clay films in pores; strongly acid; clear wavy boundary.

B31—25 to 31 inches; yellowish brown (10YR 5/4) silt loam; few coarse distinct light brownish gray (10YR 6/2) and few medium distinct yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to weak medium platy; friable; medium acid; clear wavy boundary.

B32—31 to 39 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/8) and common coarse distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium platy; friable; medium acid; clear wavy boundary.

C—39 to 60 inches; yellowish brown (10YR 5/4) silt loam; massive; laminated; friable; a few horizontal streaks of dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2); medium acid.

The solum is 35 to 60 inches thick.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 4 inches thick. The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It is silt loam or silty clay loam. The B horizon is very strongly acid to medium acid in the upper part and medium acid to neutral in the lower part. The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is laminated. Silt loam and silty clay loam are the dominant textures, although thin strata of loam, fine sandy loam, and silty clay are in many pedons.

Haskins series

The Haskins series consists of deep, somewhat poorly drained soils that formed in glacial outwash and in the underlying glacial till or lacustrine material on outwash plains and uplands. Permeability is moderate in the upper and middle parts of the subsoil and slow or very slow in the lower part of the subsoil and in the underlying material. Slopes range from 0 to 6 percent.

Haskins soils are commonly adjacent to Rawson soils and are similar to Jimtown soils. Jimtown soils formed in glacial outwash and do not have glacial till or lacustrine material in the substratum. Rawson soils are moderately well drained and are less gray in the subsoil.

Typical pedon of Haskins loam, 2 to 6 percent slopes, about 3 miles north of Auburn Center, in Newbury Township, 465 yards west along Bell Street from its intersection with Auburn Road, then 125 yards south:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam; weak fine and medium granular structure; friable; many roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.

A2—7 to 10 inches; brown (10YR 5/3) loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; friable; common roots; dark grayish brown (10YR 4/2) organic stains on faces of peds and along root channels; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B1—10 to 17 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; moderate coarse subangular blocky structure; friable; few roots; thin patchy light brownish gray (2.5Y 6/2) silt coatings on vertical faces of peds; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B21t—17 to 21 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few roots; thin patchy grayish brown (10YR 5/2) clay films on faces of prisms; thin very patchy light brownish gray (2.5Y 6/2) silt coatings on faces of peds; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B22t—21 to 26 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few roots; thin patchy grayish brown (10YR 5/2) clay films on vertical faces of prisms; common medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; strongly acid; clear wavy boundary.

B23t—26 to 31 inches; dark yellowish brown (10YR 4/4) gravelly sandy clay loam; few medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; grayish brown (10YR 5/2) clay films in voids and bridging sand grains and pebbles; many medium distinct very dark brown (10YR 2/2) concretions (iron and manganese oxides); 15 percent coarse fragments; strongly acid; abrupt wavy boundary.

IIB3t—31 to 43 inches; dark brown (10YR 4/3) clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; weak very coarse prismatic structure parting to weak thick platy; firm; thin patchy grayish brown (10YR 5/2) clay films on vertical faces of peds and in voids; many medium distinct very dark brown (10YR 2/2) concretions (iron and manganese oxides); 5 percent coarse fragments; slightly acid; gradual wavy boundary.

IIC1—43 to 53 inches; brown (10YR 4/3) clay loam; common medium and coarse distinct yellowish brown (10YR 5/6) mottles; massive; firm; 8 percent coarse fragments; neutral; gradual wavy boundary.
IIC2—53 to 60 inches; brown (10YR 4/3) clay loam; common medium and coarse distinct yellowish brown (10YR 5/6) mottles; massive; firm; 10 percent coarse fragments; strong effervescence; moderately alkaline.

The solum is 32 to 48 inches thick and typically extends into the underlying fine textured material. Gravel content ranges from 2 to 20 percent in the upper part of the B horizon and 0 to 10 percent in the lower part of the B horizon and in the C horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. It is neutral to strongly acid. The B horizon has hue of 10YR or 2.5Y, value of 4 to 5, and chroma of 2 to 4. It is dominantly clay loam or sandy clay loam, but the range includes loam and thin strata of sandy loam and gravelly phases of these textures. The B horizon is slightly acid to strongly acid in the upper part and neutral to strongly acid in the lower part. The IIB horizon has hue of 10YR to 5Y or N, value of 4 or 5, and chroma of 0 to 3. It is clay, silty clay, silty clay loam, or clay loam. It is slightly acid to mildly alkaline. The IIC horizon is clay, silty clay, clay loam, or silty clay loam.

Holly series

The Holly series consists of deep, poorly drained soils that formed in alluvium on flood plains. Permeability is moderate or moderately slow. Slopes range from 0 to 2 percent.

Holly soils are commonly adjacent to Orrville soils and are similar to Damascus, Sebring, and Wabasha soils. Orrville soils are somewhat poorly drained and are in slightly higher positions on the flood plains. Damascus and Sebring soils have an argillic horizon. Damascus soils are on terraces. Sebring soils are on terraces and in basins of former glacial lakes and have more silt and less sand in the subsoil. Wabasha soils have a darker colored surface layer and have more clay in the subsoil and substratum.

Typical pedon of Holly silt loam, frequently flooded, about 3.4 miles east-southeast of Chesterland, in Munson Township, 0.5 mile south along Rockhaven Road from its intersection with Wye Road, then 17 yards west:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; friable; many fine roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.
B21g—9 to 12 inches; dark gray (10YR 4/1) silt loam; weak medium and coarse subangular blocky structure; firm; 5 percent coarse fragments; common fine black stains (iron and manganese oxides); thin very patchy very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.
B22g—12 to 17 inches; dark gray (10YR 4/1) clay loam; common medium distinct brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; firm; few fine roots; 5 percent coarse fragments; slightly acid; abrupt smooth boundary.
B23g—17 to 21 inches; dark gray (10YR 4/1) clay loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; many medium black (10YR 2/1) stains and concretions (iron and manganese oxides); 5 percent coarse fragments; slightly acid; clear smooth boundary.
C1g—21 to 25 inches; gray (10YR 5/1) clay loam; many coarse distinct yellowish brown (10YR 5/4) mottles; massive; friable; 15 percent coarse fragments; slightly acid; clear smooth boundary.
C2g—25 to 30 inches; very dark gray (N 3/0) gravelly loam; many coarse prominent dark yellowish brown (10YR 4/4) and common fine distinct gray (N 6/0) mottles; massive; friable; about 25 percent coarse fragments; neutral; abrupt smooth boundary.
C3g—30 to 35 inches; gray (N 5/0) sandy loam; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; friable; 10 percent coarse fragments; neutral; clear smooth boundary.
C4g—35 to 60 inches; gray (N 5/0) gravelly sandy loam; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; very friable; 20 percent coarse fragments; slight effervescence; mildly alkaline.

The solum is 20 to 40 inches thick. Content of coarse fragments ranges from 0 to 15 percent by volume in the B horizon and 10 to 25 percent in the C horizon.

The Ap horizon has hue of 10YR, value of 4, and chroma of 1 or 2. Some pedons have a thin A1 horizon. The A horizon is dominantly silt loam, although it is loam in some pedons. Reaction is slightly acid or medium acid. The B horizon has hue of 10YR, 5Y, or N, value of 4 to 6, and chroma of 2 or less. It is silt loam, loam, or clay loam. Thin subhorizons less than 4 inches thick that have coarser or finer texture are present in some pedons. The B horizon ranges from neutral to strongly acid. The C horizon has hue of 10YR to 5Y or N, value of 3 to 6, and chroma of 2 or less. It is silt loam, loam, sandy loam, or a gravelly analog above a depth of 40 inches. Below a depth of 40 inches the C horizon typically is stratified sandy loam, loamy sand, sand, or a gravelly analog. Thin strata of clay loam and silty clay loam are in some pedons. The C horizon is slightly acid to mildly alkaline.

Jimtown series

The Jimtown series consists of deep, somewhat poorly drained, moderately permeable soils that formed in

stratified outwash deposits on stream terraces and outwash plains. Slopes range from 0 to 3 percent.

Jimtown soils are commonly adjacent to Bogart and Damascus soils and are similar to Haskins soils. Bogart soils are moderately well drained and are in slightly higher positions on the landscape. They are less gray in the subsoil. Damascus soils are poorly drained and are more gray in the subsoil. Haskins soils formed in glacial outwash and the underlying glacial till or lacustrine material on outwash plains and uplands.

Typical pedon of Jimtown silt loam, 0 to 3 percent slopes, about 3 miles southwest of Montville, in Montville Township, 715 yards north along Kile Road from its intersection with Chardon Windsor Road, then 83 yards east:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; friable; many roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.

B1—9 to 14 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) and common medium and coarse distinct strong brown (7.5YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; friable; common roots; thin patchy light gray (10YR 7/2) silt coatings, white (10YR 8/1) dry, on horizontal and vertical faces of peds; 2 percent coarse fragments; medium acid; clear wavy boundary.

B21t—14 to 20 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium and coarse distinct strong brown (7.5YR 5/6 and 5/8) mottles; weak medium and fine subangular blocky structure; firm; common roots; thin patchy light gray (10YR 6/1) and light brownish gray (10YR 6/2) clay films on horizontal and vertical faces of peds; thin patchy light gray (10YR 7/2) silt coatings, white (10YR 8/1) dry, on faces of peds; 2 percent coarse fragments; medium acid; clear wavy boundary.

B22t—20 to 26 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) and common medium and coarse distinct strong brown (7.5YR 5/8 and 5/6) mottles; weak medium and fine subangular blocky structure; firm; few roots; thin very patchy light gray (10YR 6/1) and light brownish gray (10YR 6/2) clay films on faces of peds; medium very patchy light gray (10YR 7/2) silt coatings, white (10YR 8/1) dry, on vertical faces of peds; 3 percent coarse fragments; strongly acid; abrupt smooth boundary.

B23t—26 to 32 inches; yellowish brown (10YR 5/4) fine sandy loam; common fine faint yellowish brown (10YR 5/6) and few medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few roots; thin very patchy brown (10YR 5/3) clay films bridging sand grains and pebbles on faces of peds; slightly acid; abrupt smooth boundary.

B3t—32 to 40 inches; yellowish brown (10YR 5/4) gravelly loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; thin very patchy brown (10YR 5/3) clay films on faces of peds; clay films bridging sand grains and pebbles; 25 percent coarse fragments; slightly acid; abrupt smooth boundary.

C1—40 to 53 inches; dark grayish brown (10YR 4/2) gravelly loamy sand; single grained; loose; 40 percent coarse fragments; mildly alkaline; clear smooth boundary.

C2—53 to 60 inches; dark gray (10YR 4/1) gravelly loamy sand; single grained; loose; 20 percent coarse fragments; mildly alkaline.

The solum is 30 to 48 inches thick. The content of coarse fragments ranges from 2 to 15 percent in the A and B horizons above a depth of 20 inches, from 0 to 50 percent in the B and C horizons between depths of 20 and 40 inches, and as much as 60 percent in the B and C horizons below a depth of 40 inches.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3. Some pedons have an A1 horizon as much as 5 inches thick and an A2 horizon as much as 8 inches thick. The A horizon is very strongly acid to neutral. The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is loam, sandy clay loam, fine sandy loam, or a gravelly analog. Thin subhorizons of silt loam or silty clay loam are in some pedons. The B horizon is slightly acid to very strongly acid. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 0 to 4. It is loamy sand, sandy loam, fine sandy loam, loamy fine sand, sand, or a gravelly analog. It is slightly acid to moderately alkaline.

Lordstown series

The Lordstown series consists of moderately deep, well drained, moderately permeable soils that formed in glacial till and in residuum of sandstone bedrock on uplands. Slopes range from 2 to 70 percent.

Lordstown soils are commonly adjacent to Loudonville and Mitiwanga soils and are similar to Brecksville, Loudonville, and Wooster soils. Brecksville soils have more clay in the subsoil and are underlain by shale bedrock. Loudonville soils have fewer coarse fragments in the solum and have an argillic horizon. Mitiwanga soils are wetter and are gray in the subsoil. Wooster soils are deep to bedrock and have a fragipan.

Typical pedon of Lordstown channery loam from an area of Lordstown-Rock outcrop complex, 18 to 70 percent slopes, about 3 miles north-northwest of Middlefield, in Huntsburg Township, 770 yards north of the intersection of State Route 608 and Durkee Road:

O1—4 inches to 0; fresh and partially decomposed leaves and twigs.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) channery loam; moderate medium granular

structure; very friable; many roots; 20 percent coarse fragments; very strongly acid; abrupt smooth boundary.

A2—4 to 6 inches; brown (10YR 5/3) channery loam; weak fine and medium granular structure; very friable; many roots; very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) organic coatings in old root and worm channels; 20 percent coarse fragments; very strongly acid; clear wavy boundary.

B21—6 to 12 inches; dark yellowish brown (10YR 4/4) channery loam; weak medium subangular blocky structure; friable; common roots; very dark grayish brown (10YR 3/2) organic coatings in old root and worm channels; 25 percent coarse fragments; very strongly acid; clear wavy boundary.

B22—12 to 21 inches; yellowish brown (10YR 5/4) channery fine sandy loam; weak medium and coarse subangular blocky structure; friable; common roots; very dark grayish brown (10YR 3/2) organic coatings in old root and worm channels; 30 percent coarse fragments; very strongly acid; gradual wavy boundary.

C—21 to 28 inches; yellowish brown (10YR 5/4) very channery fine sandy loam; massive; friable; few roots; very dark grayish brown (10YR 3/2) organic coatings in old root and worm channels; 50 percent coarse fragments; very strongly acid; abrupt wavy boundary.

R—28 inches; thin- to thick-bedded jointed sandstone conglomerate bedrock.

Thickness of the solum and depth to bedrock ranges from 20 to 40 inches. The content of coarse fragments ranges from 10 to 35 percent by volume in the A horizon, 15 to 35 percent in the B horizon, and 20 to 60 percent in the C horizon.

The A1 horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. It is very strongly acid to slightly acid. The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is loam, fine sandy loam, or a channery analog. Reaction is strongly acid or very strongly acid. The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is medium acid to very strongly acid.

Loudonville series

The Loudonville series consists of moderately deep, well drained, moderately permeable soils that formed on uplands in glacial till and in residuum of the underlying sandstone bedrock. Slopes range from 2 to 12 percent.

Loudonville soils are commonly adjacent to Lordstown and Mitiwanga soils and are similar to Lordstown and Wooster soils. Lordstown soils do not have an argillic horizon and have more coarse fragments in the solum. Mitiwanga soils are on low knolls and flats and are grayish in the upper part of the subsoil. Wooster soils are deep to bedrock and have a fragipan.

Typical pedon of Loudonville silt loam, 2 to 6 percent slopes, about 2.6 miles north-northwest of Middlefield, in Middlefield Township, about 245 yards southeast along State Route 608 from its intersection with Durkee Road, then 522 yards west:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many roots; 3 percent coarse fragments; medium acid; abrupt smooth boundary.

B1—8 to 12 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; common roots; 3 percent coarse fragments; very strongly acid; clear wavy boundary.

B21t—12 to 20 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; thin patchy dark brown (7.5YR 4/4) clay films on faces of peds; 5 percent coarse fragments; very strongly acid; gradual wavy boundary.

B22t—20 to 26 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; firm; thin very patchy dark brown (7.5YR 4/4) clay films on faces of peds; common medium very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 8 percent coarse fragments; very strongly acid; clear wavy boundary.

IIB3—26 to 34 inches; yellowish brown (10YR 5/4) sandy loam; common medium distinct light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) mottles; weak medium and coarse subangular blocky structure; friable; few fine and medium dark brown (7.5YR 3/2) stains and concretions (iron and manganese oxides); 10 percent coarse fragments; strongly acid; abrupt wavy boundary.

IIR—34 inches; sandstone bedrock.

The thickness of the solum and depth to sandstone bedrock range from 20 to 40 inches. The content of coarse fragments ranges from 0 to 5 percent by volume in the Ap horizon, 2 to 15 percent in the B2 horizon, and 10 to 60 percent in the IIB3 and IIC horizons. Reaction in the solum is medium acid to very strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 4 inches thick and an A2 horizon. The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The B2 horizon is loam, clay loam, silt loam, or silty clay loam. The IIB3 horizon is loam, sandy loam, or a channery analog.

Mahoning series

The Mahoning series consists of deep, somewhat poorly drained, slowly or very slowly permeable soils that formed in glacial till on uplands. Slopes range from 0 to 12 percent.

Mahoning soils are commonly adjacent to Ellsworth soils and are similar to Caneadea, Darien, and Wadsworth soils and are less gray in the subsoil. Caneadea soils formed in lacustrine material and have more clay in the B and C horizons. Darien soils have less clay in the subsoil and have mixed mineralogy. Wadsworth soils have a fragipan.

Typical pedon of Mahoning silt loam, 2 to 6 percent slopes, about 3.5 miles north of Newbury, in Munson Township, 740 yards east along Bean Road from its intersection with Auburn Road, then 100 yards south:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many fine roots; 2 to 5 percent coarse fragments; neutral; abrupt smooth boundary.

B1—8 to 12 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; moderate medium and coarse subangular blocky structure; firm; common fine roots; grayish brown (10YR 5/2) coatings on faces of peds; many fine black (10YR 2/1) concretions (iron and manganese oxides); 2 to 5 percent coarse fragments; medium acid; abrupt smooth boundary.

B21t—12 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate medium and coarse subangular blocky structure; firm; common fine roots; grayish brown (10YR 5/2) coatings on faces of peds; thin patchy clay films on faces of peds, common black (10YR 2/1) stains (iron and manganese oxides); 2 to 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B22t—14 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to strong medium and coarse subangular blocky; firm; grayish brown (10YR 5/2) coatings on faces of peds; thin patchy clay films on faces of peds; common black (10YR 2/1) stains (iron and manganese oxides); 2 to 5 percent coarse fragments; strongly acid; clear smooth boundary.

B23t—18 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate coarse prismatic structure parting to strong medium and coarse subangular blocky; firm; gray (10YR 5/1) coatings on surfaces of peds; thin continuous clay films on faces of peds; common black (10YR 2/1) stains (iron and manganese oxides); about 5 percent coarse fragments; neutral; clear smooth boundary.

B31—27 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to weak thick platy; firm; thin patchy clay films and grayish brown (10YR 5/2) and light gray (10YR 7/1) coatings on vertical faces of peds; 2 to 5 percent coarse fragments; slight effervescence; mildly alkaline; clear wavy boundary.

B32—32 to 36 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to moderate medium platy; grayish brown (10YR 5/2) coatings on vertical faces of peds; 2 to 5 percent coarse fragments; slight effervescence; mildly alkaline; clear wavy boundary.

C—36 to 60 inches; dark yellowish brown (10YR 4/4) silty clay loam; massive with weak vertical partings; firm; common grayish brown (10YR 5/2) coatings on vertical partings; thin patchy gray (10YR 6/1) calcans on vertical partings; 5 percent coarse fragments; strong effervescence; moderately alkaline.

The solum is 30 to 42 inches thick. Depth to bedrock is typically more than 60 inches, although it is 40 to 60 inches in bedrock substratum phases. The upper part of the solum is strongly acid to very strongly acid. Except where lime has been added, the lower part of the solum ranges from medium acid to mildly alkaline.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 5 inches thick and an A2 horizon. The B horizon has hue of 10YR or 2.5Y, value of 4 or 6, ahd chroma of 2 to 4. It is commonly silty clay loam. Less commonly it is silty clay, clay, or clay loam. The color of the C horizon is similar to that of the B horizon. The C horizon is commonly silty clay loam, although in some pedons it is clay loam.

Mitiwanga series

The Mitiwanga series consists of moderately deep, somewhat poorly drained, moderately permeable soils that formed in glacial till 20 to 40 inches thick over sandstone bedrock on uplands. Slopes range from 0 to 3 percent.

Mitiwanga soils are commonly adjacent to Lordstown and Loudonville soils and are similar to Darien, Ravenna, and Wadsworth soils. Lordstown and Loudonville soils are well drained and are less gray in the subsoil. Darien, Ravenna, and Wadsworth soils are deep to bedrock. Ravenna and Wadsworth soils have a fragipan.

Typical pedon of Mitiwanga silt loam, 0 to 3 percent slopes, about .5 mile north of Thompson in Thompson Township, 1,100 yards north along State Route 528 from its intersection with Thompson Road, then 270 yards west:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium and fine granular structure; friable; many roots; common black (10YR 2/1) concretions (iron and manganese oxides); 2 percent coarse fragments; medium acid; abrupt smooth boundary.

B1—9 to 15 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; common dark grayish brown (10YR 4/2) fillings in old root channels; grayish brown (10YR 5/2) coatings on faces of peds; 2 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21t—15 to 21 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; thick continuous light brownish gray (2.5Y 6/2) coatings on faces of peds; thin patchy clay films on faces of peds; 2 percent coarse fragments; very strongly acid; clear smooth boundary.

B22t—21 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; common medium distinct brown (7.5YR 4/4) mottles; moderate coarse subangular blocky structure parting to weak thick platy; firm; light brownish gray (2.5Y 6/2) coatings on faces of peds; thin patchy grayish brown (10YR 5/2) clay films on vertical faces of peds; few black (10YR 2/1) stains (iron and manganese oxides); 2 percent coarse fragments; very strongly acid; clear smooth boundary.

B23t—26 to 31 inches; dark yellowish brown (10YR 4/4) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak thick platy; firm; light brownish gray (2.5Y 6.2) coatings on faces of peds; thin patchy clay films on faces of peds; 2 percent coarse fragments; very strongly acid; abrupt smooth boundary.

IIR—31 inches; sandstone bedrock.

The thickness of the solum and depth to a lithic contact range from 20 to 40 inches, although they are dominantly 30 to 40 inches. The content of coarse fragments is 2 to 10 percent by volume in the A horizon and 2 to 25 percent in the B horizon.

Some pedons have an A1 horizon 1 to 4 inches thick and an A2 horizon. The A horizon ranges from very strongly acid to medium acid, except where lime has been added. The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is silt loam, silty clay loam, clay loam, or loam. Reaction ranges from very strongly acid to medium acid.

Orrville series

The Orrville series consists of deep, somewhat poorly drained, moderately permeable soils that formed in alluvium on flood plains. Slopes range from 0 to 2 percent.

Orrville soils are commonly adjacent to Holly, Tioga, and Wabasha soils. Holly soils are poorly drained, and Wabasha soils are very poorly drained. Both soils are more grayish in the subsoil. Wabasha soils have more clay in the solum and have a darker colored surface layer. Tioga soils are well drained and are not gray in the subsoil.

Typical pedon of Orrville silt loam, frequently flooded, about 3.4 miles east-southeast of Chesterland, in Munson Township, 1,210 yards south along Rockhaven Road from its intersection with Wye Road, then 17 yards east:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

B21—6 to 10 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct grayish brown (10YR 5/2) and common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

B22—10 to 15 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) mottles; weak coarse subangular blocky structure; friable; common fine roots; 2 percent coarse fragments; medium acid; clear wavy boundary.

B23g—15 to 21 inches; grayish brown (10YR 5/2) loam; many medium distinct brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; friable; common fine roots; 2 percent coarse fragments; strongly acid; gradual wavy boundary.

B3g—21 to 31 inches; grayish brown (10YR 5/2) loam; massive; friable; 2 percent coarse fragments; strongly acid; clear wavy boundary.

C1g—31 to 40 inches; gray (5Y 5/1) fine sandy loam; common medium distinct olive (5Y 5/3) and common medium prominent brown (7.5YR 4/4) mottles; massive; friable; 5 percent coarse fragments; strongly acid; clear wavy boundary.

C2g—40 to 46 inches; gray (5Y 5/1) loamy fine sand; single grained; friable; 10 percent coarse fragments; medium acid; clear smooth boundary.

C3g—46 to 60 inches; gray (N 5/0) gravelly loamy sand; single grained; loose; 20 percent coarse fragments; medium acid.

The solum is 24 to 40 inches thick. Content of coarse fragments is 0 to 5 percent by volume in the A horizon and 0 to 15 percent in the B horizon.

The A horizon is slightly acid to strongly acid, except where lime has been added. The B horizon has hue of 10YR, 2.5Y, or N, value of 4 to 6, and chroma of 0 to 6. It is silt loam, loam, or clay loam. The B horizon ranges from slightly acid to strongly acid. The C horizon is typically stratified below a depth of 40 inches. Commonly the texture is fine sandy loam, sandy loam, sand, or a gravelly analog. Thin stony layers are in some pedons. Reaction ranges from neutral to strongly acid.

Oshtemo series

The Oshtemo series consists of deep, well drained soils that formed in stratified loamy and sandy material on stream terraces, outwash plains, and kames. Permeability is moderately rapid in the upper part of the subsoil and very rapid in the substratum. Slopes range from 2 to 18 percent and from 25 to 50 percent.

The Oshtemo soils are commonly adjacent to and are similar to Chili soils. Chili soils have more gravel and clay in the subsoil.

Typical pedon of Oshtemo sandy loam, 2 to 6 percent slopes, about 1.9 miles south of Auburn Corners, in Auburn Township, 330 yards south along State Route 44 from its intersection with Bartholomew Road, then 165 yards east:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) sandy loam; moderate medium granular structure; friable; many roots; 4 percent coarse fragments; slightly acid; abrupt smooth boundary.

B1—9 to 15 inches; dark brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; common roots; 6 percent coarse fragments; slightly acid; clear smooth boundary.

B21t—15 to 24 inches; dark brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; few roots; thin very dark yellowish brown (10YR 4/4) clay bridging between sand grains and small pebbles; 10 percent coarse fragments; slightly acid; clear smooth boundary.

B22t—24 to 33 inches; dark brown (7.5YR 4/4) sandy loam; weak medium and coarse subangular blocky structure; friable; thin very patchy dark yellowish brown (10YR 4/4) clay bridging between sand grains and small pebbles; 8 percent coarse fragments; strongly acid; clear smooth boundary.

B23t—33 to 38 inches; dark brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; firm; thin very patchy dark yellowish brown (10YR 4/4) clay bridging between sand grains and small pebbles; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B3—38 to 52 inches; dark brown (7.5YR 4/4) loamy sand; single grained; loose; 8 percent coarse fragments; medium acid; clear smooth boundary.

C1—52 to 64 inches; brown (10YR 5/3) loamy sand; single grained; loose; 10 percent coarse fragments; medium acid; abrupt smooth boundary.

C2—64 to 66 inches; brown (10YR 5/3) gravelly loamy sand; single grained; loose; 35 percent coarse fragments; slightly acid.

The solum is 40 to 65 inches thick, although the range is dominantly 45 to 55 inches. Content of coarse fragments ranges from 1 to 10 percent by volume in the A horizon and upper part of the B horizon, from 1 to 30 percent in the lower part of the B horizon, and from 1 to 40 percent in the C horizon. The solum ranges from slightly acid to strongly acid, except for the lower part of the B3 horizon, which is neutral in some pedons.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 5 inches thick and an A2 horizon. The B2 horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. It is sandy clay loam, sandy loam, or a gravelly analog. The C horizon has hue of 10YR, value of 5, and chroma of 2 to 4. It is loamy sand, sand, gravelly loamy sand, or gravelly sand. It is medium acid to neutral.

Platea series

The Platea series consists of deep, somewhat poorly drained soils that formed in glacial till on uplands. Permeability is moderately slow above the fragipan and very slow in the fragipan. Slopes range from 0 to 6 percent.

Platea soils are commonly adjacent to Ellsworth and Sheffield soils and are similar to Fitchville and Wadsworth soils. Ellsworth soils are moderately well drained and are less gray in the upper part of the subsoil. Ellsworth and Fitchville soils do not have a fragipan. Sheffield soils are poorly drained and are more gray in the subsoil. Wadsworth soils have a part of the argillic horizon above the fragipan.

Typical pedon of Platea silt loam, 0 to 2 percent slopes, about 3 miles southeast of Huntsburg, in Huntsburg Township, 715 yards west along Burton Windsor Road from its intersection with Bundyburg Road, then 220 yards south:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; friable; many roots; few medium very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 3 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B1—8 to 11 inches; yellowish brown (10YR 5/4) silt loam; common fine faint yellowish brown (10YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; friable; common roots; thin continuous and patchy grayish brown (10YR 5/2) silt coatings on faces of peds; few medium very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 3 percent coarse fragments; very strongly acid; clear wavy boundary.

B2—11 to 17 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and common medium faint yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium subangular blocky structure; firm; common roots; medium continuous and thin patchy light brownish gray (10YR 6/2) coatings on vertical faces of peds; few medium very dark grayish brown (10YR 3/2) stains and concretions (iron and manganese oxides); 3 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx1—17 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate very coarse prismatic structure parting to moderate medium platy; very firm and brittle; few roots along faces of prisms; medium continuous and thin very patchy grayish brown (10YR 5/2) clay films; yellowish brown (10YR 5/6 and 5/8) borders of prisms; common fine and medium very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 5 percent coarse fragments; medium acid; gradual wavy boundary.

Bx2—22 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and few fine prominent reddish brown (5YR 4/4) mottles; moderate very coarse prismatic structure parting to moderate thick platy; very firm and brittle; few roots along faces of prisms; medium patchy and thin very patchy gray (10YR 5/1) clay films; yellowish brown (10YR 5/8) borders of prisms; common fine and medium very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 8 percent coarse fragments; slightly acid; clear wavy boundary.

Bx3—28 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak very coarse prismatic structure parting to weak coarse subangular blocky; firm; few roots along faces of prisms; thick patchy gray (10YR 5/1) clay films; yellowish brown (10YR 5/8) borders of prisms; 10 percent coarse fragments; neutral; clear wavy boundary.

B3—34 to 45 inches; dark yellowish brown (10YR 4/4) silt loam; weak very coarse prismatic structure; firm; thick patchy gray (10YR 5/1) clay flows on yellowish brown (10YR 5/8) borders of prisms; 14 percent coarse fragments; slight effervescence; mildly alkaline; gradual wavy boundary.

C—45 to 60 inches; yellowish brown (10YR 5/4) silt loam; massive; firm; 8 percent coarse fragments; strong effervescence; moderately alkaline.

The solum is 34 to 48 inches thick. Depth to carbonates ranges from 30 to 42 inches. The content of coarse fragments ranges from 2 to 5 percent above the Bx horizon and from 2 to 10 percent in the Bx and C horizons.

Some pedons have an A1 horizon 2 to 4 inches thick and an A2 horizon 2 to 4 inches thick. The A horizon is medium acid to extremely acid, except where lime has been added. The B2 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is silt loam or silty clay loam. Reaction is medium acid to extremely acid. The Bx horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is commonly silty clay loam. Less commonly it is clay loam or silt loam. The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4. It is silty clay loam or silt loam.

Ravenna series

The Ravenna series consists of deep, somewhat poorly drained soils that formed in glacial till on uplands. Permeability is moderate above the fragipan and slow in the fragipan.

Ravenna soils are commonly adjacent to Canfield and Wooster soils and are similar to Platea and Wadsworth soils. Canfield and Wooster soils are better drained and are less gray in the subsoil. Platea soils have more silt and less sand in the subsoil and do not have an argillic horizon above the fragipan. Wadsworth soils have less sand and more clay above the fragipan.

Typical pedon of Ravenna silt loam, 2 to 6 percent slopes, about 3 miles south-southeast of Newbury, in Auburn Township, 105 yards south along Messenger Road from its intersection with Franks Road, then 85 yards west:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many roots; 3 percent coarse fragments; slightly acid; abrupt smooth boundary.

B1—9 to 12 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) and few fine faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common roots; thin continuous dark grayish brown (10YR 4/2) silt coatings on vertical faces of peds; 5 percent coarse fragments; medium acid; clear wavy boundary.

B21t—12 to 15 inches; yellowish brown (10YR 5/4) loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; common roots; medium patchy gray (10YR 5/1) clay films on faces of peds; thin patchy dark grayish brown (10YR 4/2) silt coatings on vertical faces of peds; 5 percent coarse fragments; medium acid; clear wavy boundary.

B22t—15 to 19 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; common roots; medium patchy gray (10YR 5/1) clay films on faces of peds; many medium and coarse dark brown (7.5YR 3/2) concretions (iron and manganese oxides); 5 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx1—19 to 31 inches; dark yellowish brown (10YR 4/4) loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium platy; firm and brittle; few roots; medium continuous light brownish gray (10YR 6/2) clay films on vertical yellowish brown (10YR 5/6) borders of prisms; moderate medium and coarse very dark brown (10YR 2/2) concretions

(iron and manganese oxides); 8 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx2—31 to 43 inches; dark brown (10YR 4/3) loam; few fine distinct light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak medium platy; firm and brittle; medium continuous light brownish gray (10YR 6/2) clay films on vertical yellowish brown (10YR 5/6) borders of prisms; common medium dark brown (7.5Y 3/2) concretions (iron and manganese oxides); 10 percent coarse fragments; very strongly acid; clear wavy boundary.

B3—43 to 50 inches; brown (10YR 4/3) loam; weak coarse subangular blocky structure; firm; medium gray (10YR 6/1) coatings on vertical yellowish brown (10YR 5/6) borders of prisms; common medium dark brown (7.5YR 3/2) concretions (iron and manganese oxides); 12 percent coarse fragments; medium acid; clear wavy boundary.

C—50 to 60 inches; brown (10YR 4/3) loam; massive; firm; common medium distinct dark brown (7.5YR 3/2) concretions (iron and manganese oxides); 12 percent coarse fragments; medium acid.

The solum is 40 to 80 inches thick. Depth to carbonates ranges from 60 to 100 inches.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. Some pedons have an A1 horizon 1 to 5 inches thick. The A horizon is medium acid or strongly acid, except where lime has been added. The B2 horizon has hue of 7.5YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is clay loam, loam, or silt loam with a weighted average clay content of 18 to 27 percent. Reaction is medium acid to very strongly acid. The Bx horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is loam, silt loam, or sandy loam. Reaction is very strongly acid to medium acid. The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma or 3 or 4. It is silt loam, loam, or sandy loam. Reaction is medium acid to mildly alkaline.

Rawson series

The Rawson series consists of deep, moderately well drained soils that formed in glacial outwash and in the underlying till or lacustrine material on terraces and uplands. Permeability is moderate in the upper loamy material and slow or very slow in the underlying material. Slopes range from 2 to 6 percent.

The Rawson soils in Geauga County have gray mottles closer to the soil surface than is defined within the range for the series. This difference, however, does not affect the use and management of these soils.

Rawson soils are commonly adjacent to Haskins soils and are similar to Bogart and Canfield soils. Bogart soils formed in glacial outwash and do not have the glacial till or lacustrine material in the substratum. Canfield soils formed in glacial till and have a fragipan. Haskins soils are somewhat poorly drained and are more gray in the subsoil.

Typical pedon of Rawson loam, 2 to 6 percent slopes, about 3 miles north of Auburn Center, in Newbury Township, 300 yards south along Auburn Road from its intersection with Bell Street, then 150 yards east:

Ap—0 to 7 inches; dark brown (10YR 4/3) loam; moderate fine and medium granular structure; friable; many roots; 3 percent coarse fragments; strongly acid; abrupt smooth boundary.

B1—7 to 16 inches; brown (7.5YR 5/4) loam; moderate medium subangular blocky structure; friable; common roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B21t—16 to 21 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam; common medium distinct pale brown (10YR 6/3) and few fine distinct strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; common roots; thin patchy dark yellowish brown (10YR 4/4) clay films on faces of peds and bridging sand grains and pebbles; 20 percent coarse fragments; strongly acid; clear wavy boundary.

B22t—21 to 28 inches; dark yellowish brown (10YR 4/4) gravelly sandy clay loam; common fine distinct light brownish gray (10YR 6/2) and common medium distinct strong brown (7.5YR 5/8) mottles; weak fine and medium subangular blocky structure; firm; few roots; thin patchy dark brown (7.5YR 4/4) clay films on faces of peds and bridging sand grains and pebbles; 25 percent coarse fragments; strongly acid; abrupt wavy boundary.

IIB3t—28 to 33 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few roots; thin continuous gray (10YR 5/1) clay films on vertical faces of prisms; strong brown (7.5YR 5/6) borders along vertical clay seams; many medium black (10YR 2/1) stains and concretions (iron and manganese oxides); 10 percent coarse fragments; strongly acid; clear wavy boundary.

IIC1—33 to 50 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct gray (10YR 6/1) and few medium and coarse distinct strong brown (7.5YR 5/6) mottles; massive; firm; many medium and coarse dark brown (10YR 3/3) concretions and stains (iron and manganese oxides); 10 percent coarse fragments; slightly acid; diffuse smooth boundary.

IIC2—50 to 62 inches; yellowish brown (10YR 5/4) clay loam; common fine distinct gray (10YR 6/1) and few medium and coarse distinct strong brown (7.5YR 5/6) mottles; massive; firm; 10 percent coarse fragments; neutral; abrupt smooth boundary.

IIC3—62 to 80 inches; yellowish brown (10YR 5/4) clay loam; massive; firm; 10 percent coarse fragments; strong effervescence; moderately alkaline.

The solum is 26 to 42 inches thick. Coarse fragments range from 0 to 10 percent by volume in the A horizon, from 3 to 30 percent in the B horizon, and from 0 to 10 percent in the IIB and IIC horizons.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Some pedons have a thin A1 horizon 2 to 4 inches thick and an A2 horizon. The A horizon is neutral to very strongly acid. The B2 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It commonly is clay loam, sandy clay loam, loam, or a gravelly analog. Reaction ranges from strongly acid to mildly alkaline. The IIB horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. It is clay, silty clay, silty clay loam, or clay loam. It is strongly acid to mildly alkaline.

Rittman series

The Rittman series consists of deep, moderately well drained soils that have a dense fragipan. The fragipan restricts rooting depth and the movement of water. Permeability is moderate above the fragipan and slow in the fragipan and substratum. These soils formed in glacial till on uplands. Slopes range from 2 to 50 percent.

Rittman soils are commonly adjacent to Wadsworth soils and are similar to Canfield, Ellsworth, and Geeburg soils. Canfield soils have less clay in the subsoil. Ellsworth and Geeburg soils have more clay in the subsoil and do not have a fragipan. Wadsworth soils are somewhat poorly drained and are more gray in the subsoil.

Typical pedon of Rittman silt loam, 2 to 6 percent slopes, about 3 miles southeast of Middlefield, in Parkman Township, 110 yards southeast on Old State Road from its intersection with Shedd Road, then 165 yards west:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; friable; many roots; 3 percent coarse fragments; medium acid; abrupt smooth boundary.

B1—8 to 15 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; common roots; thin very patchy light yellowish brown (10YR 6/4) silt coatings on faces of peds; dark grayish brown (10YR 4/2) krotovinas; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B21t—15 to 20 inches; yellowish brown (10YR 5/4) clay loam; many medium and coarse faint yellowish brown (10YR 5/6 and 5/8) and common fine and medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few roots; thin patchy brown (10YR 5/3) clay films on faces of peds; medium continuous pale brown (10YR 6/3) silt coatings on vertical faces of peds; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B22t—20 to 25 inches; dark yellowish brown (10YR 4/4) clay loam; common fine and medium distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) and many fine and medium distinct strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few roots; gray (10YR 5/1) clay films that are medium continuous on faces of peds and thin very patchy on horizontal faces; medium brown (10YR 4/3) and light gray (10YR 7/1 and 7/2) silt coatings on faces of peds; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx1—25 to 30 inches; dark yellowish brown (10YR 4/4) clay loam; common fine and medium prominent strong brown (7.5YR 5/6 and 5/8) mottles; moderate very coarse prismatic structure parting to weak medium platy; very firm and brittle; few roots along vertical faces of prisms; medium continuous light gray (5Y 6/1) clay films on vertical faces of peds; few fine distinct black (10YR 2/1) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; very strongly acid; gradual wavy boundary.

Bx2—30 to 44 inches; dark yellowish brown (10YR 4/4) clay loam; weak very coarse prismatic structure parting to moderate medium platy; very firm and brittle; medium continuous light gray (5Y 6/1) clay films on vertical faces of peds; common fine and medium distinct black (10YR 2/1) concretions and stains (iron and manganese oxides); 7 percent coarse fragments; very strongly acid; clear wavy boundary.

B3—44 to 53 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and coarse subangular blocky structure; firm; thin patchy light gray (5Y 6/1) clay films on vertical faces of peds; common fine and medium distinct black (10YR 2/1) concretions and stains (iron and manganese oxides); 7 percent coarse fragments; medium acid; clear wavy boundary.

C—53 to 60 inches; brown (10YR 4/3) clay loam; massive; firm; 10 percent coarse fragments; slightly acid.

The solum is 42 to 60 inches thick. Depth to the top of the fragipan ranges from 18 to 36 inches. Coarse fragments range from 0 to 10 percent by volume above the Bx horizon and from 2 to 15 percent in the Bx and C horizons.

The Ap horizon has hue of 10YR, value of 4 of 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 4 inches thick and an A2 horizon 4 to 6 inches thick. The A horizon is medium acid to very strongly acid, except where lime has been added. The B2 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is clay loam or silty clay loam. Reaction is very strongly acid or strongly acid. The Bx horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It is

commonly clay loam or silty clay loam. Less commonly it is loam. Reaction is strongly acid or very strongly acid in the upper part of the Bx horizon and very strongly acid to slightly acid in the lower part. The B3 horizon is medium acid to neutral. The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is silty clay loam or clay loam. Reaction is slightly acid to mildly alkaline. Most pedons have some free carbonates.

Sebring series

The Sebring series consists of deep, poorly drained, moderately slowly permeable soils. These soils formed in water-laid deposits on terraces and in basins of former glacial lakes. Slopes range from 0 to 2 percent.

Sebring soils are commonly adjacent to Fitchville and Glenford soils and are similar to Canadice, Damascus, Holly, and Sheffield soils. Canadice soils have more clay in the B and C horizons. Damascus and Holly soils have more sand in the B horizon. Damascus soils formed in stratified outwash deposits. Holly soils formed in alluvium on flood plains and do not have an argillic horizon. Sheffield soils have a fragipan. Glenford soils are moderately well drained, and Fitchville soils are somewhat poorly drained. Both Glenford and Fitchville soils are less gray in the subsoil.

Typical pedon of Sebring silt loam, about 3 miles east-southeast of Chesterland, in Munson Township, 1.2 miles east on U.S. Route 322 from its intersection with Heath Road, then 1.6 miles south:

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) rubbed; moderate medium and fine granular structure; friable; many roots; very strongly acid; abrupt smooth boundary.

A2g—3 to 8 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/4 and 5/8) mottles; weak medium and coarse subangular blocky structure; friable; many roots; thin continuous grayish brown (10YR 5/2) silt coatings on faces of peds; yellowish brown (10YR 5/4) organic stains in root channels; very strongly acid; clear wavy boundary.

B1g—8 to 13 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/4) and few medium distinct yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; friable; common roots; thin very patchy grayish brown (10YR 5/2) clay films in voids; thin continuous light brownish gray (10YR 6/2) silt coatings on faces of peds; very strongly acid; clear wavy boundary.

B21tg—13 to 20 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few roots; thin patchy grayish brown (10YR 5/2) clay films on faces of peds and in voids; medium acid; clear wavy boundary.

B22tg—20 to 32 inches; light brownish gray (10YR 6/2) silty clay loam; many medium distinct yellowish brown (10YR 5/4) and common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; few roots; thick continuous grayish brown (10YR 5/2) clay films on vertical faces of peds and thin patchy grayish brown (10YR 5/2) clay films on pores; few fine faint very dark brown (10YR 2/2) (iron and manganese oxides) stains; slightly acid; clear wavy boundary.

B23t—32 to 37 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak thick platy; firm; few roots; thick continuous grayish brown (10YR 5/2) clay films on faces of peds; neutral; clear wavy boundary.

B3—37 to 44 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; neutral; gradual smooth boundary.

C1—44 to 48 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; massive; friable; weak effervescence; mildly alkaline; gradual smooth boundary.

C2—48 to 60 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; weak effervescence; mildly alkaline.

The solum is 30 to 50 inches thick. The solum typically does not have coarse fragments, although in some pedons the B and C horizons are as much as 5 percent.

The A1 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The A horizon is very strongly acid to medium acid, except where lime has been added. The B2 horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2 above a depth of 30 inches. It is silty clay loam or silt loam. Thin strata of loam or clay loam are in some pedons. Reaction is medium acid to very strongly acid in the upper part of the B2 horizon and neutral to strongly acid in the lower part. The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 6. It is commonly stratified or laminated silt loam or silty clay loam. Less commonly it is loam or clay loam.

Sheffield series

The Sheffield series consists of deep, poorly drained soils that formed in glacial till on uplands. Permeability is very slow in the fragipan and moderately slow in the upper part of the subsoil above the fragipan and in the substratum. Slopes range from 0 to 2 percent.

Sheffield soils are commonly adjacent to Platea soils and are similar to Sebring soils. Platea soils are somewhat poorly drained and are less gray in the subsoil. Sebring soils formed in lacustrine deposits and do not have a fragipan.

Typical pedon of Sheffield silt loam, 3.7 miles southeast of Montville in Huntsburg Township, 835 yards east on Chardon Windsor Road from its intersection with State Route 86, then 220 yards north:

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam; common medium distinct dark brown (7.5YR 4/4) mottles around root channels; weak medium and coarse granular structure; friable; many roots; 2 percent coarse fragments; medium acid; abrupt smooth boundary.

B1g—8 to 11 inches; light brownish gray (2.5Y 6/2) silt loam; many coarse distinct yellowish brown (10YR 5/4) and common medium distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; firm; common roots; medium continuous light brownish gray (2.5Y 6/2) silt coatings on faces of peds; many fine very dark brown (10YR 2/2) stains (iron and manganese oxides); 2 percent coarse fragments; medium acid; clear wavy boundary.

B21g—11 to 15 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; firm; common roots; medium continuous light brownish gray (2.5Y 6/2) silt coatings on faces of peds; many fine very dark brown (10YR 2/2) stains (iron and manganese oxides); 2 percent coarse fragments; medium acid; clear wavy boundary.

B22g—15 to 20 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate coarse subangular blocky; firm; few roots; medium continuous light brownish gray (2.5Y 6/2) silt coatings on faces of peds; many medium distinct very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 2 percent coarse fragments; slightly acid; clear wavy boundary.

Bx1—20 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6) and many medium distinct light olive brown (2.5Y 5/4) mottles; weak very coarse prismatic structure parting to weak coarse subangular blocky; firm and brittle; few roots; thick continuous gray (10YR 5/1) clay films on vertical faces of peds and medium patchy clay films on horizontal faces of peds and in pores; light brownish gray (10YR 6/2) silt coatings on faces of peds; many medium distinct very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; neutral; clear wavy boundary.

Bx2—28 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; weak very coarse prismatic structure parting to weak coarse subangular blocky; firm and brittle; few roots; thick continuous grayish brown (10YR 5/2) clay films in pores and along old root channels; yellowish brown (10YR 5/8) borders along vertical structural breaks; grayish brown (10YR 5/2) silt coatings on faces of peds; 5 percent coarse fragments; neutral; clear wavy boundary.

C—40 to 60 inches; brown (10YR 4/3) silty clay loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; massive; firm; 5 percent coarse fragments; strong effervescence; moderately alkaline.

The solum is 40 to 50 inches thick. Depth to carbonates ranges from 30 to 45 inches. The solum is typically 2 to 5 percent coarse fragments, by volume, but the range is 2 to 10 percent.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Some pedons have an A1 horizon 1 to 4 inches thick and have an A2 horizon. The B2 horizon has hue of 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silt loam or silty clay loam. It is very strongly acid to slightly acid. The Bx horizon has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or silty clay loam and is medium acid to neutral. The C horizon has colors similar to those of the Bx horizon. It is mildly alkaline or moderately alkaline.

Tioga series

The Tioga series consists of deep, well drained soils that formed in alluvium on flood plains. Permeability is moderate or moderately rapid. Slopes range from 0 to 2 percent.

Tioga soils are commonly adjacent to Orrville soils. Orrville soils are somewhat poorly drained and are more gray in the subsoil.

Typical pedon of Tioga loam, frequently flooded, about 3.5 miles north of Chardon, in Chardon Township, 1,200 yards northeast along Clark Road from its intersection with Robinson Road, then 220 yards east:

A11—0 to 6 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; many roots; 2 percent coarse fragments; medium acid; clear smooth boundary.

A12—6 to 10 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; common roots; 2 percent coarse fragments; medium acid; clear wavy boundary.

B21—10 to 22 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable; few roots; few dark grayish brown (10YR 4/2) stains in old root channels; 5 percent coarse fragments; medium acid; gradual wavy boundary.

B22—22 to 30 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable; few roots; 5 percent coarse fragments; slightly acid; gradual wavy boundary.
C1—30 to 45 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; 10 percent fragments; slightly acid; clear wavy boundary.
C2—45 to 62 inches; brown (10YR 4/3) gravelly loamy sand; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; single grained; loose; 25 percent coarse fragments; neutral.

The solum is 18 to 40 inches thick. The content of coarse fragments ranges from 0 to 25 percent by volume below a depth of 40 inches. Reaction is strongly acid to slightly acid in the solum and slightly acid or neutral in the substratum.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The B horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. It is sandy loam or loam. The C horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is loamy sand, sandy loam, or a gravelly analog.

Wabasha series

The Wabasha series consists of deep, very poorly drained soils that formed in alluvium and slack-water deposits of flood plains. Permeability is slow. Slopes range from 0 to 2 percent.

Wabasha soils are commonly adjacent to Carlisle, Holly, and Orrville soils and are similar to Canadice and Willette soils. Carlisle soils formed in organic material. Willette soils formed in organic material over lakebed sediment. Canadice soils formed in lakebed sediment and have an argillic horizon. Holly and Orrville soils have less clay in the solum. Orrville soils are somewhat poorly drained and are in slightly higher positions on the flood plain.

Typical pedon of Wabasha silty clay loam, ponded, about 4.2 miles south of Burton, in Troy Township, .6 mile south along Rapids Road from its intersection with Stafford Road, then .7 mile west:

A11—0 to 3 inches; very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium granular structure; friable; many fine roots; neutral; abrupt wavy boundary.
A12—3 to 8 inches; black (10YR 2/1) silty clay loam; dark gray (10YR 4/1) dry; weak coarse subangular blocky structure parting to moderate fine and medium granular; friable; many fine roots; neutral; abrupt smooth boundary.
B1g—8 to 18 inches; dark gray (N 4/0) silty clay; few medium distinct olive brown (2.5Y 4/4) mottles; moderate medium subangular and angular blocky structure; firm; common roots; neutral; clear smooth boundary.
B21g—18 to 26 inches; gray (N 5/0) silty clay; common medium distinct olive brown (2.5Y 4/4) and few coarse prominent olive yellow (2.5Y 6/6) mottles; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; firm; few roots; neutral; clear smooth boundary.
B22g—26 to 34 inches; gray (N 6/0) silty clay; many fine and medium distinct olive (5Y 5/4 and 5/6) and few coarse prominent olive yellow (5Y 6/6 and 6/8) mottles; moderate coarse and very coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; few roots along vertical structural breaks; thin patchy dark gray (5Y 4/1) coatings on faces of peds; neutral; gradual smooth boundary.
B23g—34 to 45 inches; gray (N 6/0) silty clay; many medium distinct light olive brown (2.5Y 5/4) and few coarse prominent yellowish brown (10YR 5/4 and 5/6) mottles; weak coarse and very coarse prismatic structure parting to weak coarse subangular blocky; firm; thin patchy dark gray (5Y 4/1) coatings on faces of peds; slight effervescence; mildly alkaline; clear wavy boundary.
C—45 to 65 inches; light olive brown (2.5Y 5/4) silty clay; many medium prominent gray (N 6/0) mottles; massive with very weak vertical partings; firm; thin very patchy dark gray (N 4/0) coatings in vertical partings; few thin lenses of sandy loam; slight effervescence; mildly alkaline.

The solum is 40 to 60 inches thick.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is slightly acid or neutral. The B horizon has hue of 10YR to 5Y or N, value of 4 to 6, and chroma of 0 to 2. It is silty clay or clay and in places has strata less than 1 inch thick of a coarser texture. It is slightly acid to mildly alkaline. The C horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 to 4. It is mainly silty clay or clay, although thin layers of sandy loam, fine sandy loam, silt loam, or silty clay loam are in some pedons. The C horizon is neutral to moderately alkaline.

Wadsworth series

The Wadsworth series consists of deep, somewhat poorly drained soils that formed in glacial till on uplands. Permeability is moderate or moderately slow above the fragipan and slow or very slow in the fragipan. Slopes range from 0 to 6 percent.

Wadsworth soils are commonly adjacent to Rittman soils and are similar to Fitchville, Mahoning, Platea, and Ravenna soils. Fitchville soils formed in lake-laid sediments and do not have a fragipan. Mahoning soils have more clay in the subsoil and do not have a fragipan. Rittman soils are moderately well drained and are less gray in the subsoil. Platea soils do not have an argillic horizon above the fragipan. Ravenna soils have more sand and less silt in the subsoil and fragipan.

Typical pedon of Wadsworth silt loam, 2 to 6 percent slopes, about 1.5 miles southeast of Middlefield in Middlefield Township, .8 mile south along State Route 528 from its intersection with State Route 87, then 330 yards west:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; friable; many roots; 3 percent coarse fragments; strongly acid; abrupt smooth boundary.

B1—7 to 12 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and many medium faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; many roots; light brownish gray (10YR 6/2) coatings on faces of peds; few medium distinct very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); 3 percent coarse fragments; very strongly acid; clear wavy boundary.

B21t—12 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and many medium distinct strong brown (7.5YR 5/6 and 5/8) mottles; moderate fine and medium subangular blocky structure; firm; common roots; continuous light brownish gray (10YR 6/2) coatings and thin patchy gray (10YR 6/1) clay films on faces of peds; few medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx1—19 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak very coarse prismatic structure parting to weak thick platy; very firm and brittle; common roots along prism faces; medium continuous gray (10YR 5/1) clay films on strong brown (7.5YR 5/6) borders, 5 to 15 millimeters thick; common medium very dark grayish brown (10YR 3/2) and very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent fragments; very strongly acid; gradual wavy boundary.

Bx2—25 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak very coarse prismatic structure parting to weak thick platy; very firm and brittle; few roots along prism faces; medium continuous gray (10YR 5/1) clay films on strong brown (7.5YR 5/6) borders, 5 to 10 millimeters thick; few medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 8 percent coarse fragments; strongly acid; gradual wavy boundary.

Bx3—32 to 41 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak very coarse prismatic structure parting to moderate medium platy; very firm and brittle; thin patchy gray (10YR 5/1) clay films on strong brown (7.5YR 5/6) borders, 5 to 10 millimeters thick; few medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; medium acid; clear wavy boundary.

B3—41 to 49 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium faint yellowish brown (10YR 5/6) and common fine and medium distinct grayish brown (10YR 5/2) mottles; weak very coarse and coarse subangular blocky structure; firm; thin very patchy brown (10YR 4/3) clay films on vertical and horizontal faces of peds; few medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 5 percent coarse fragments; slightly acid; clear wavy boundary.

C—49 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; massive; firm; flecks of yellowish red (5YR 4/6); few medium very dark brown (10YR 2/2) concretions and stains (iron and manganese oxides); 10 percent coarse fragments; slight effervescence; mildly alkaline.

The solum is 34 to 60 inches thick. Coarse fragments range from 2 to 5 percent in the solum above the Bx horizon and from 5 to 10 percent in the Bx and C horizons.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. Some pedons have an A1 horizon 1 to 5 inches thick and an A2 horizon 2 to 8 inches thick. The A horizon commonly is strongly acid to extremely acid, except where lime has been added. The B2 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is silt loam, silty clay loam, or clay loam and averages 27 to 35 percent clay. Reaction is strongly acid to extremely acid. The Bx horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is clay loam, silty clay loam, or silt loam. Reaction is medium acid to very strongly acid in the upper part of the Bx horizon and medium acid to neutral in the lower part.

Wallkill series

The Wallkill series consists of deep, very poorly drained soils that formed in alluvium overlying organic soil material in bogs and on flood plains. Permeability is moderate in the mineral part and moderately rapid or rapid in the organic part. Slopes range from 0 to 2 percent.

Wallkill soils are commonly adjacent to Carlisle, Willette, and Wabasha soils and are similar to Holly and Orrville soils. Carlisle and Willette soils do not have alluvium over the organic soil material. Holly, Orrville, and Wabasha soils do not have organic material in the substratum.

Typical pedon of Wallkill silt loam, ponded, about 1.25 miles east-southeast of Burton, in Burton Township, 165 yards northwest along State Route 87 from its intersection with Gingerich Road, then 65 yards north:

A11—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine and medium crumb structure; very friable; many roots; medium acid; clear smooth boundary.
A12—2 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine and medium granular structure; very friable; many roots; few fine very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); strongly acid; clear smooth boundary.
B21g—7 to 13 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium and coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; many roots; thin dark brown (7.5YR 4/4) coatings in old root channels; few fine very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); strongly acid; clear smooth boundary.
B22g—13 to 23 inches; grayish brown (10YR 5/2) silt loam; weak fine and medium subangular blocky structure; friable; many roots; thin dark brown (7.5YR 4/4) coatings in old root channels; few fine faint very dark brown (10YR 2/2) stains and concretions (iron and manganese oxides); abrupt smooth boundary.
IIOa1—23 to 43 inches; dark brown (7.5YR 4/4) broken face and dark brown (7.5YR 3/2) rubbed sapric material; 40 percent fibers, 15 percent rubbed; moderate medium and coarse granular structure; very friable; medium acid; gradual wavy boundary.
IIOa2—43 to 56 inches; dark brown (7.5YR 4/4) broken face and rubbed sapric material; 20 percent fibers, 2 percent rubbed; massive; very friable; slightly acid; gradual wavy boundary.
IIOa3—56 to 63 inches; dark brown (7.5YR 4/4) broken face and dark brown (7.5YR 3/2) rubbed sapric material; 12 percent fibers, 2 percent rubbed; massive; friable; neutral.

Thickness of the alluvium over the organic material ranges from 16 to 40 inches, although it is dominantly 20 to 30 inches. Most pedons do not have coarse fragments, although in some pedons the mineral horizons are as much as 15 percent gravel. The soil ranges from strongly acid to mildly alkaline in the mineral horizons and from medium acid to mildly alkaline in the organic layers.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. The Bg horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. It is dominantly silt loam. Subhorizons of silty clay loam or loam are present in some pedons. The IIO horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is mainly sapric material. Subhorizons of hemic material are present in some pedons.

Willette series

The Willette series consists of deep, very poorly drained soils in bogs on lake plains and till plains. These soils formed in organic material that is 16 to 50 inches thick over mineral deposits. Permeability is moderately rapid in the organic layers and slow in the mineral material. Slopes range from 0 to 2 percent.

Willette soils are similar to Carlisle and Wabasha soils. Carlisle soils formed in organic material more than 51 inches thick. Wabasha soils formed in mineral material.

Typical pedon of Willette muck, ponded, about 4 miles south of Burton, in Troy Township, 660 yards east of the intersection of Stafford Road and Rapids Road:

Oa1—0 to 10 inches; black (10YR 2/1) broken face and rubbed sapric material; 5 percent fibers, none rubbed; moderate medium granular structure; very friable; neutral; clear wavy boundary.
Oa2—10 to 16 inches; black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed sapric material; 10 percent fibers, 5 percent rubbed; moderate medium granular structure; very friable; 2 percent woody fragments 1 to 4 inches in diameter; neutral; clear wavy boundary.
Oa3—16 to 22 inches; black (10YR 2/1) broken face, very dark grayish brown (10YR 3/2) rubbed material; 15 percent fibers, 5 percent rubbed; weak coarse granular structure; very friable; 3 percent woody fragments 1 to 4 inches in diameter; 30 percent mineral material; neutral; abrupt smooth boundary.
IIC1g—22 to 38 inches; gray (10YR 5/1) silty clay; massive; firm; neutral; clear smooth boundary.
IIC2g—38 to 60 inches; gray (10YR 6/1) silty clay; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; firm; weak effervescence; mildly alkaline.

The depth to the IIC horizon ranges from 16 to 50 inches. Some pedons have layers in the organic part of the control section that are 5 to 15 percent woody fragments. The solum ranges from medium acid to mildly alkaline, and the C horizon ranges from medium acid to moderately alkaline.

The surface tier has hue of 10YR, value of 2, and chroma of 1 or 2 on broken face and rubbed material. The organic part of the subsurface and bottom tiers has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 to 3 on broken face and rubbed material. The IIC horizon has hue of 10YR or 2.5Y or is neutral, value of 4 to 6, and chroma of 0 to 2. It is commonly silty clay or clay. Less commonly it is silty clay loam or clay loam.

Wooster series

The Wooster series consists of deep, well drained soils that formed in glacial till on uplands. These soils have a moderately slowly permeable fragipan that

restricts rooting depth and the movement of water. Slopes range from 12 to 18 percent.

Wooster soils are commonly adjacent to Canfield and Ravenna soils and are similar to Canfield, Chili, Lordstown, and Loudonville soils. Canfield and Ravenna soils are wetter and are more gray in the subsoil. Chili soils have stratified outwash deposits in the substratum and do not have a fragipan. Lordstown and Loudonville soils are moderately deep to bedrock and do not have a fragipan.

Typical pedon of Wooster silt loam, 12 to 18 percent slopes, about 2 miles north of Burton, in Burton Township, .8 mile north along Claridon Troy Road from its intersection with Fisher Road, then 330 yards west:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine and medium subangular blocky structure; friable; many roots; 5 percent coarse fragments; medium acid; abrupt smooth boundary.

B1—8 to 11 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; many roots; dark brown (10YR 4/3) organic coatings in old root and worm channels and on some faces of peds; 5 percent coarse fragments; medium acid; clear wavy boundary.

B2t—11 to 20 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; firm; common roots; thin patchy dark brown (7.5YR 4/4) clay films on faces of peds; common fine black (10YR 2/1) concretions and stains (iron and manganese oxides); 10 percent coarse fragments; very strongly acid; clear wavy boundary.

Bx1—20 to 25 inches; dark brown (10YR 4/3) loam; weak very coarse prismatic structure parting to moderate medium and thick platy; firm and brittle; few roots on vertical faces of prisms; dark brown (7.5YR 4/4) clay films that are thin patchy on vertical faces of prisms and very patchy on horizontal faces; strong brown (7.5YR 5/6 and 5/8) borders along vertical clay seams; common fine and medium black (10YR 2/1) stains and concretions (iron and manganese oxides); 12 percent coarse fragments; very strongly acid; gradual wavy boundary.

Bx2—25 to 34 inches; dark yellowish brown (10YR 4/4) loam; common fine and medium distinct light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to moderate medium platy; firm and brittle; few roots along prism faces; thin patchy gray (10YR 5/1) clay films on vertical faces of prisms and thin patchy dark brown (7.5YR 4/4) clay films on horizontal faces; strong brown (7.5YR 5/6 and 5/8) borders along vertical clay seams; thin patchy light yellowish brown (10YR 6/4) silt coatings on vertical faces of prisms; common fine and medium black (10YR 2/1) stains and concretions (iron and manganese oxides); 14 percent coarse fragments; very strongly acid; clear wavy boundary.

B3t—34 to 56 inches; brown (10YR 5/3) loam; common medium distinct grayish brown (10YR 5/2) mottles; weak medium and coarse subangular blocky structure; firm; thin patchy gray (10YR 6/1) clay films on vertical faces of peds and thin very patchy dark brown (7.5YR 4/4) clay films on horizontal faces; strong brown (7.5YR 5/6 and 5/8) borders along vertical clay seams; common fine and medium black (10YR 2/1) stains and concretions (iron and manganese oxides); 14 percent coarse fragments; very strongly acid; clear wavy boundary.

C—56 to 60 inches; dark yellowish brown (10YR 4/4) gravelly loam; massive; friable; 25 percent coarse fragments; strongly acid.

The solum is 40 to 80 inches thick. Reaction is very strongly acid to medium acid in the upper part of the solum and in the fragipan, except where lime has been added. It is very strongly acid to neutral in the B3 and C horizons. Carbonates are at a depth of 60 to 100 inches in some pedons.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Some pedons have an A1 horizon 1 to 5 inches thick. The A horizon is dominantly silt loam, although it is loam in some pedons. The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It is loam, silt loam, clay loam, or a gravelly analog. The Bx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is loam, silt loam, clay loam, silty clay loam, or a gravelly analog. The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 4 to 6. It is dominantly loam and gravelly loam, although in some pedons it is gravelly sandy loam or gravelly silt loam.

formation of the soils

This section describes the major factors of soil formation, tells how these factors have affected the soils in Geauga County, and explains some of the processes in soil formation.

factors of soil formation

Soils are the product of soil-forming processes acting on material deposited or accumulated by geologic forces. The major factors in soil formation are parent material, climate, relief, living organisms, and time.

Climate and living organisms, particularly vegetation, are the active forces in soil formation. Their effect on the parent material is modified by relief and by the length of time the parent material has been acted upon. The relative importance of each factor differs from place to place. In some places one factor dominates and determines most of the soil properties. However, generally the interaction of all five factors determines what kind of soil forms in any given place.

parent material

The soils in Geauga County formed in several kinds of parent material: glacial till, glacial outwash, lacustrine deposits, weathered products of sedimentary rocks, accumulated organic material, and recent alluvium derived from these various materials.

The county was covered by glaciers during several stages of the Pleistocene Age, and consequently glacial drift, a general term applied to extensive glacial deposits of both till and outwash, is the most extensive parent material in the county. The upland soils formed in glacial till, and many of the terrace soils formed in glacial outwash. The till is fairly homogenous and uniform in texture, and the soils that formed in this parent material have a medium textured to fine textured subsoil. Mahoning, Wadsworth, Ravenna, Platea, Ellsworth, Rittman, and Canfield soils formed in glacial till.

Outwash, consisting of sand and gravel, was deposited by the many streams of glacial melt water. In places, glacial kames formed. Much of this fairly well sorted, coarse material was covered by finer textured loamy outwash. Chili and Jimtown soils formed in these outwash materials. Chili soils are brown and reddish brown because they formed where the natural drainage is good. Jimtown soils are mottled with gray because they formed where the water table is high and aeration is poor during part of the year.

Minor areas of lacustrine material or lake-bottom sediment are primarily in the Chagrin and Cuyahoga River systems. The interlayered silty and clayey parent material in these areas is evident in the medium textured to fine textured subsoil of the Sebring, Fitchville, Glenford, Canadice, and Caneadea soils.

Alluvial material, carried and deposited by floodwaters, is the youngest parent material in the county. This material is still accumulating, as fresh sediment is added periodically by the overflow of streams. Such sediment derives mainly from the surface layer of soils and exposed glacial drift in the surrounding higher areas. Holly, Orrville, and Tioga soils formed in deep, loamy, relatively fertile, and strongly acid to mildly alkaline alluvial material.

Organic material has accumulated in a few scattered areas of the Chagrin, Cuyahoga, and Grand River valleys. It consists mainly of the decomposed remains of trees, sedges, and grasses. This material is in depressions and in drainageways where the water table is high and seepage water has kept the area permanently wet. Carlisle and Willette soils formed in deep, fertile, black to reddish brown, and strongly acid to mildly alkaline organic material.

climate

The climate in Geauga County is uniform enough that it has not greatly contributed to differences among the soils. It has been favorable to both physical change and chemical weathering of parent materials and to biological activity.

Rainfall has been adequate for percolating water to leach carbonates to a depth of 2 to 3 1/2 feet in many soils, for example, Platea and Mahoning soils, and to a depth of more than 4 feet in other soils, for example, Chili and Rittman soils. The distribution of rainfall has caused wetting and drying cycles favorable to the translocation of clay minerals and to the formation of soil structure, evident in Mahoning and Ellsworth soils, for example.

Temperature variations have favored physical change and chemical weathering of parent material. Freezing and thawing contribute to the formation of soil structure, and warm temperatures in summer promote chemical reactions in the weathering of primary minerals.

Rainfall and temperature have been favorable to plant growth and the subsequent accumulation of some organic matter in all the soils.

More information about the climate of Geauga County is given in the section "General nature of the county."

relief

Relief can account for the formation of different soils from the same kind of parent material. Glenford, Fitchville, and Sebring soils all formed in lacustrine deposits. The moderately well drained Glenford soils formed where the slope was not steep enough to cause excessive erosion nor so nearly level as to prevent runoff. The somewhat poorly drained Fitchville soils formed where runoff was slow or medium. Nearby, the poorly drained Sebring soils formed on broad flats and in depressions where some organic residue accumulated because the water table was high several months of the year.

living organisms

The native vegetation at the time Geauga County was settled was hardwood forest of beech, maple, oak, hickory, ash, and elm. There were grassy clearings on the marshy openings in the poorly drained swales.

The soils that formed in the forested areas are acid and moderate or low in natural fertility. These soils include Mahoning, Ellsworth, and Loudonville soils. The soils that formed in the marshy swales are poorly drained and very poorly drained, less acid, and somewhat more fertile, for example, Sheffield, Canadice, and Wabasha soils.

Small animals, insects, worms, and roots make the soil more permeable by making channels in the soil. Animals also mix the soil materials through their activities and contribute organic matter to the soil. Wormholes or worm casts are plentiful in the highly organic surface layer of forested and grassed mineral soils, for example, Ellsworth and Rittman soils. Crawfish channels are prevalent in the poorly drained and very poorly drained Canadice, Sebring, and Wabasha soils.

Man also affects the formation of the soils, mainly by plowing, planting, and introducing plants. In some areas the formation of the soils is affected by drainage, irrigation, and removal of soil material for construction purposes. The use of lime and fertilizer changes the chemistry of the soils.

time

Time is needed for the other soil-forming factors to produce their effects. The age of a soil is indicated, to some extent, by the degree of profile formation. In many places, factors other than time have been responsible for most of the differences in kind and distinctness of horizons in the different soils. If the parent material weathers slowly, the profile forms slowly. If slopes are steep and soil is removed almost as fast as it forms, no distinct horizons form.

Most of the soils in the county have a well formed profile, including Ellsworth, Mahoning, and Chili soils. On the flood plains, periodic deposits of fresh sediment interrupt the soil-forming processes. The Holly and Orrville soils on the flood plains are examples of soils in which horizons are not well formed or expressed.

processes of soil formation

Most of the soils in Geauga County have a strongly expressed profile, because the processes of soil formation have produced distinct changes in the material in which the soils formed. For example, the soils that formed in glacial till on uplands and in glacial outwash on terraces along the major valleys show evidence of distinct changes. In contrast, the soils on the flood plains are only slightly modified from the parent material.

There are four main processes responsible for horizon differentiation: *additions, removals, transfers,* and *transformations.* Some of these processes promote horizon differentiation, and others retard or obliterate differences that are already present.

Organic matter is an example of an addition to the soil. Soils that formed where a high water table has restricted decomposition of organic matter have a deep, dark colored surface layer. The surface layer is high in organic matter and has good structure. Base saturation exceeds 50 percent. Examples of such soils are Carlisle, Willette, and Wabasha soils. In most soils some organic matter accumulates as a thin mat on the surface, but this mat is usually obliterated by cultivation. Severe erosion can remove all evidence of this addition to the soil profile.

Leaching of carbonates from calcareous parent material is a significant loss that precedes many other chemical changes. Most of the glacial till in Geauga County has a low content of carbonates, generally 5 to 15 percent. In most of the soils, carbonates have been leached to a depth of 36 inches or more; consequently, the soil in the upper 36 inches is acid. Other minerals in the soil are subject to the same chemical weathering, but their resistance is higher and therefore removal is slower. Following the removal of carbonates, alteration of such minerals as biotite and feldspar results in changes in color within the profile. Free iron oxides are produced and, if segregated by a fluctuating high water table, are the cause of gray colors and mottling. This process is evident in Sebring soils. Unless the water table is seasonally high within the profile, the upper horizons typically have brownish colors that have stronger chroma of redder hue than those in the C horizon.

Seasonal wetting and drying is largely responsible for the transfer of clay from the A horizon to the ped surfaces in the B horizon. The fine clays become suspended in percolating water moving through the A horizon and are carried downward to the B horizon. In the B horizon the fine clays are deposited on the surface of peds by drying or by precipitation caused by free carbonates. This transfer of fine clays accounts for the

patchy or nearly continuous clay films on the faces of peds in the B horizon of Ellsworth and Fitchville soils. Transformation of mineral compounds is evident in most of the soils. The results of transformation are most apparent if the formation of horizons is not affected by rapid erosion or by accumulation of material at the surface. The primary silicate minerals are weathered chemically to produce secondary minerals, mainly those of the layer-lattice silicate clays. Most of the layer-lattice clays remain in place in the soil profile; however, clay from the A horizon is transferred to the deeper horizons.

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glossary

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—

	Inches
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, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

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

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

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

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

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

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

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

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

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

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

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

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

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

Compressible (in tables). Excessive decrease in volume of soft soil under load.

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.

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.

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

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

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

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

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.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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 the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

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

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some 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 ovendry 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, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

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.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

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.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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 7.5 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 (7.5 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 underlying material below the water table.

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

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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 upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

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 A or B 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, the Roman numeral II precedes the letter C.

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

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-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.

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

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

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

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

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

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.

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

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.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

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

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

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

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

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

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. Sandy loam and fine sandy loam.

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

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

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

Mottling, soil. Irregular spots of different colors that vary in number and size. 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).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

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

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

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

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

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

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

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

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

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 0.20 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. For example, slope, stoniness, and thickness.

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

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

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

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

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

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

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

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.

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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

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

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-size 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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses

of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

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 runoff water.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

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.

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

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

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 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 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
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 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.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind 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 grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

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

Surface soil. The A horizon including all subdivisions (A1, A2, and A3).

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.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

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

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

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

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

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

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

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

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

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

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

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

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

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Chardon, Ohio]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	32.7	17.1	24.9	59	-9	0	3.20	2.01	4.27	9	26.7
February	34.9	17.7	26.4	60	-9	0	2.71	1.75	3.58	8	21.8
March	43.3	25.4	34.4	75	5	6	3.71	2.37	4.91	11	19.4
April	57.4	36.2	46.8	82	17	77	4.25	2.72	5.63	10	4.4
May	68.2	46.0	57.1	86	28	250	3.83	2.41	5.11	10	.1
June	77.4	55.5	66.5	92	40	495	4.05	2.74	5.25	8	.0
July	80.9	59.3	70.1	92	45	623	3.54	2.17	4.76	7	.0
August	79.7	58.1	68.9	92	44	586	3.98	2.16	5.47	8	.0
September	73.3	51.5	62.4	91	33	378	3.48	2.25	4.59	7	.0
October	62.8	41.9	52.4	83	24	155	3.62	1.70	5.18	9	1.5
November	48.3	32.5	40.4	72	12	9	4.25	3.00	5.39	11	12.0
December	36.4	22.4	29.4	65	-1	0	3.69	2.57	4.71	11	26.8
Yearly:											
Average	57.9	38.6	48.3	---	---	---	---	---	---	---	---
Extreme	---	---	---	94	-11	---	---	---	---	---	---
Total	---	---	---	---	---	2,579	44.31	39.47	49.01	109	112.7

[1]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° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Chardon, Ohio]

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--	April 23	May 5	May 24
2 years in 10 later than--	April 19	April 30	May 19
5 years in 10 later than--	April 10	April 22	May 9
First freezing temperature in fall:			
1 year in 10 earlier than--	October 22	October 11	September 25
2 years in 10 earlier than--	October 28	October 17	October 2
5 years in 10 earlier than--	November 8	October 29	October 15

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Chardon, Ohio]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	187	167	132
8 years in 10	195	175	141
5 years in 10	211	190	158
2 years in 10	227	204	175
1 year in 10	235	212	184

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

Map symbol	Soil name	Acres	Percent
BgB	Bogart loam, 2 to 6 percent slopes	1,849	0.7
BrF	Brecksville silt loam, 25 to 70 percent slopes	700	0.3
Ca	Canadice silt loam	1,449	0.6
CcA	Caneadea silt loam, 0 to 2 percent slopes	523	0.2
CcB	Caneadea silt loam, 2 to 6 percent slopes	229	0.1
CdB	Canfield silt loam, 2 to 6 percent slopes	11,762	4.5
CdC	Canfield silt loam, 6 to 12 percent slopes	2,570	1.0
Cf	Carlisle muck, ponded	2,170	0.8
CnA	Chili loam, 0 to 2 percent slopes	270	0.1
CnB	Chili loam, 2 to 6 percent slopes	4,553	1.8
CnC	Chili loam, 6 to 12 percent slopes	2,699	1.0
CoD2	Chili gravelly loam, 12 to 18 percent slopes, eroded	1,957	0.8
CyD	Chili-Oshtemo complex, 6 to 18 percent slopes	2,454	0.9
CyF	Chili-Oshtemo complex, 25 to 50 percent slopes	330	0.1
Da	Damascus silt loam	1,417	0.5
DrA	Darien silt loam, bedrock substratum, 0 to 2 percent slopes	5,018	1.9
DrB	Darien silt loam, bedrock substratum, 2 to 6 percent slopes	1,582	0.6
EhB	Ellsworth silt loam, 2 to 6 percent slopes	8,892	3.4
EhB2	Ellsworth silt loam, 2 to 6 percent slopes, eroded	3,132	1.2
EhC	Ellsworth silt loam, 6 to 12 percent slopes	6,883	2.6
EhC2	Ellsworth silt loam, 6 to 12 percent slopes, eroded	3,381	1.3
EhD	Ellsworth silt loam, 12 to 18 percent slopes	2,457	0.9
EhD2	Ellsworth silt loam, 12 to 18 percent slopes, eroded	925	0.4
EhE	Ellsworth silt loam, 18 to 25 percent slopes	504	0.2
EhF	Ellsworth silt loam, 25 to 50 percent slopes	3,118	1.2
EmC	Ellsworth silt loam, shale substratum, 6 to 12 percent slopes	578	0.2
EmD	Ellsworth silt loam, shale substratum, 12 to 18 percent slopes	265	0.1
FcA	Fitchville silt loam, 0 to 2 percent slopes	2,078	0.8
FcB	Fitchville silt loam, 2 to 6 percent slopes	1,002	0.4
GbB	Geeburg silt loam, 2 to 6 percent slopes	688	0.3
GbC	Geeburg silt loam, 6 to 12 percent slopes	135	0.1
GfB	Glenford silt loam, 2 to 6 percent slopes	551	0.2
GfC	Glenford silt loam, 6 to 12 percent slopes	168	0.1
HsA	Haskins loam, 0 to 2 percent slopes	4,402	1.7
HsB	Haskins loam, 2 to 6 percent slopes	5,495	2.1
Ho	Holly silt loam, frequently flooded	7,360	2.8
JtA	Jimtown silt loam, 0 to 3 percent slopes	2,478	1.0
LrB	Lordstown loam, 2 to 6 percent slopes	714	0.3
LrC	Lordstown loam, 6 to 12 percent slopes	520	0.2
LxD	Lordstown-Rock outcrop complex, 12 to 18 percent slopes	1,082	0.4
LxF	Lordstown-Rock outcrop complex, 18 to 70 percent slopes	1,417	0.5
LyB	Loudonville silt loam, 2 to 6 percent slopes	3,294	1.3
LyC	Loudonville silt loam, 6 to 12 percent slopes	2,856	1.1
MgA	Mahoning silt loam, 0 to 2 percent slopes	5,581	2.1
MgB	Mahoning silt loam, 2 to 6 percent slopes	41,725	16.0
MgC	Mahoning silt loam, 6 to 12 percent slopes	1,267	0.5
MsA	Mahoning silt loam, shale substratum, 0 to 2 percent slopes	994	0.4
MsB	Mahoning silt loam, shale substratum, 2 to 6 percent slopes	3,626	1.4
MtA	Mitiwanga silt loam, 0 to 3 percent slopes	1,842	0.7
Or	Orrville silt loam, frequently flooded	6,117	2.4
OsB	Oshtemo sandy loam, 2 to 6 percent slopes	2,092	0.8
OsC	Oshtemo sandy loam, 6 to 12 percent slopes	367	0.1
Pg	Pits, gravel	549	0.2
Pq	Pits, quarry	537	0.2
PsA	Platea silt loam, 0 to 2 percent slopes	4,199	1.6
PsB	Platea silt loam, 2 to 6 percent slopes	5,609	2.2
ReA	Ravenna silt loam, 0 to 2 percent slopes	2,278	0.9
ReB	Ravenna silt loam, 2 to 6 percent slopes	2,550	1.0
RmB	Rawson loam, 2 to 6 percent slopes	4,728	1.8
RsB	Rittman silt loam, 2 to 6 percent slopes	15,192	5.8
RsC	Rittman silt loam, 6 to 12 percent slopes	3,745	1.4
RsC2	Rittman silt loam, 6 to 12 percent slopes, eroded	1,278	0.5
RsD	Rittman silt loam, 12 to 18 percent slopes	797	0.3
RsE	Rittman silt loam, 18 to 25 percent slopes	226	0.1
RsF	Rittman silt loam, 25 to 50 percent slopes	2,226	0.9
Sb	Sebring silt loam	4,214	1.6
Sf	Sheffield silt loam	3,657	1.4
Tg	Tioga loam, frequently flooded	2,249	0.9
Ud	Udorthents, loamy	1,455	0.6
Ur	Urban land	385	0.1
Wa	Wabasha silty clay loam, ponded	793	0.3
WbA	Wadsworth silt loam, 0 to 2 percent slopes	4,291	1.6

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

Map symbol	Soil name	Acres	Percent
WbB	Wadsworth silt loam, 2 to 6 percent slopes	26,381	10.1
Wc	Wallkill silt loam, ponded	252	0.1
Wt	Willette muck, ponded	229	0.1
WuD	Wooster silt loam, 12 to 18 percent slopes	326	0.1
	Water	2,816	1.1
	Total	260,480	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

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

Soil name and map symbol	Corn	Winter wheat	Oats	Grass-legume hay
	Bu	Bu	Bu	Ton
BgB---- Bogart	100	40	76	4.5
BrF---- Brecksville	---	---	---	---
Ca---- Canadice	75	---	60	2.5
CcA---- Caneadea	92	36	70	3.2
CcB---- Caneadea	94	38	72	3.2
CdB---- Canfield	100	40	75	4.0
CdC---- Canfield	95	35	70	3.8
Cf---- Carlisle	---	---	---	---
CnA---- Chili	102	40	80	4.6
CnB---- Chili	90	38	78	4.6
CnC---- Chili	82	32	72	3.0
CoD2---- Chili	---	30	58	2.6
CyD---- Chili-Oshtemo	---	30	58	2.6
CyF---- Chili-Oshtemo	---	---	---	---
Da---- Damascus	80	35	65	3.0
DrA---- Darien	90	45	60	3.5
DrB---- Darien	85	42	57	3.5
EhB---- Ellsworth	85	35	70	3.8
EhB2---- Ellsworth	80	35	68	3.6
EhC---- Ellsworth	80	35	68	3.6
EhC2---- Ellsworth	72	32	62	3.4
EhD---- Ellsworth	60	30	54	3.2

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Winter wheat	Oats	Grass-legume hay
	Bu	Bu	Bu	Ton
EhD2--- Ellsworth	55	26	50	3.0
EhE--- Ellsworth	---	---	---	---
EhF--- Ellsworth	---	---	---	---
EmC--- Ellsworth	75	35	68	3.8
EmD--- Ellsworth	60	30	64	3.2
FcA--- Fitchville	100	38	72	4.0
FcB--- Fitchville	100	35	68	4.0
GbB--- Geeburg	65	30	65	3.0
GbC--- Geeburg	56	28	62	2.6
GfB--- Glenford	110	40	75	4.5
GfC--- Glenford	95	36	70	4.0
HsA--- Haskins	110	46	86	4.4
HsB--- Haskins	108	44	84	4.4
Ho--- Holly	90	---	---	3.2
JtA--- Jimtown	92	40	70	4.0
LrB--- Lordstown	85	40	72	3.5
LrC--- Lordstown	75	36	68	3.2
LxD--- Lordstown-Rock outcrop	---	---	---	---
LxF--- Lordstown-Rock outcrop	---	---	---	---
LyB--- Loudonville	95	42	75	4.2
LyC--- Loudonville	85	40	70	3.8
MgA--- Mahoning	90	30	68	3.8
MgB--- Mahoning	90	32	70	3.6

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Winter wheat	Oats	Grass-legume hay
	Bu	Bu	Bu	Ton
MgC---------- Mahoning	65	24	54	3.2
MsA---------- Mahoning	90	30	68	3.8
MsB---------- Mahoning	85	32	70	3.6
MtA---------- Mitiwanga	90	40	70	4.0
Or---------- Orrville	95	45	75	4.5
OsB---------- Oshtemo	80	35	70	3.0
OsC---------- Oshtemo	75	32	65	2.6
Pg*, Pq*. Pits				
PsA---------- Platea	85	38	70	3.5
PsB---------- Platea	80	34	70	3.5
ReA---------- Ravenna	100	35	70	3.5
ReB---------- Ravenna	95	38	70	3.5
RmB---------- Rawson	105	46	84	4.2
RsB---------- Rittman	100	42	75	3.8
RsC---------- Rittman	85	35	68	3.4
RsC2---------- Rittman	75	30	65	3.0
RsD---------- Rittman	75	28	60	3.0
RsE---------- Rittman	---	---	---	2.4
RsF---------- Rittman	---	---	---	---
Sb---------- Sebring	85	32	65	3.6
Sf---------- Sheffield	75	30	75	3.5
Tg---------- Tioga	110	45	80	3.5
Ud*. Udorthents				

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Winter wheat	Oats	Grass-legume hay
	Bu	Bu	Bu	Ton
Ur*. Urban land				
Wa---------- Wabasha	---	---	---	---
WbA---------- Wadsworth	90	35	65	3.5
WbB---------- Wadsworth	88	35	65	3.5
Wc---------- Wallkill	---	---	---	---
Wt---------- Willette	---	---	---	---
WuD---------- Wooster	90	30	65	3.6

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

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	---	---	---	---
II	73,404	51,690	21,444	270
III	145,413	104,256	39,065	2,092
IV	19,227	17,778	1,449	---
V	3,444	---	3,444	---
VI	5,459	5,459	---	---
VII	7,791	7,791	---	---
VIII	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
BgB---------- Bogart	1o	Slight	Slight	Slight	Slight	White oak----------	85	Eastern white pine, black walnut, yellow-poplar, white ash, red pine, northern red oak, white oak.
						Northern red oak----	85	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
BrF---------- Brecksville	3r	Severe	Severe	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar, black walnut, white ash, white oak, northern red oak.
						White oak----------	65	
						Black cherry--------	---	
						Sugar maple---------	---	
						Black walnut--------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
Ca---------- Canadice	5w	Slight	Severe	Severe	Moderate	Red maple----------	50	Eastern white pine, white spruce.
						Eastern white pine--	55	
CcA, CcB---------- Caneadea	3c	Slight	Slight	Severe	Severe	Northern red oak----	70	Austrian pine, green ash, yellow-poplar, pin oak, red maple.
						Sugar maple---------	65	
						White ash-----------	---	
						Black cherry--------	---	
						Slippery elm--------	---	
						Red maple----------	---	
						White oak----------	---	
CdB, CdC---------- Canfield	1d	Slight	Slight	Moderate	Moderate	Northern red oak----	87	Green ash, Virginia pine, yellow-poplar, red pine.
						Sugar maple---------	70	
						White ash-----------	83	
						White oak----------	---	
						Slippery elm--------	---	
						American beech------	---	
						American sycamore---	---	
CnA, CnB, CnC------ Chili	2o	Slight	Slight	Slight	Slight	White oak----------	80	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, northern red oak, white oak.
						Northern red oak----	85	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
CoD2---------- Chili	2r	Moderate	Moderate	Slight	Slight	White oak----------	80	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, northern red oak, white oak.
						Northern red oak----	85	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
CyD*: Chili----------	2o	Slight	Slight	Slight	Slight	White oak----------	80	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, northern red oak, white oak.
						Northern red oak----	85	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
Oshtemo----------	3o	Slight	Slight	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, jack pine.
						White oak----------	---	
						American basswood---	66	
						Sugar maple---------	61	

See footnote at end of table.

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CyF*: Chili	2r	Severe	Severe	Slight	Slight	White oak Northern red oak Black walnut Black cherry Sugar maple White ash Yellow-poplar	80 85 --- --- --- --- ---	Eastern white pine, red pine, black walnut, yellow-poplar, white ash, northern red oak, white oak.
Oshtemo	3r	Severe	Severe	Slight	Slight	Northern red oak White oak American basswood Sugar maple	66 --- 66 61	Eastern white pine, red pine, white spruce, jack pine.
Da Damascus	2w	Slight	Severe	Moderate	Moderate	Pin oak Northern red oak Swamp white oak Green ash Black cherry Eastern cottonwood Red maple	86 80 --- --- --- --- ---	Red maple, green ash, American sycamore, eastern cottonwood, pin oak, swamp white oak.
DrA, DrB Darien	3o	Slight	Slight	Slight	Slight	Northern red oak Sugar maple Pin oak Green ash Black cherry Eastern cottonwood Red maple Swamp white oak	70 60 --- --- --- --- --- ---	Red maple, green ash, American sycamore, eastern cottonwood, pin oak, swamp white oak.
EhB, EhB2, EhC, EhC2 Ellsworth	3o	Slight	Slight	Slight	Slight	Northern red oak White oak Yellow-poplar Black walnut Black cherry Sugar maple White ash	70 70 80 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
EhD, EhD2, EhE Ellsworth	3r	Moderate	Moderate	Slight	Slight	Northern red oak White oak Yellow-poplar Black walnut Black cherry Sugar maple White ash	70 70 80 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
EhF Ellsworth	3r	Severe	Severe	Slight	Slight	Northern red oak White oak Yellow-poplar Black walnut Black cherry Sugar maple White ash	70 70 80 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
EmC Ellsworth	3o	Slight	Slight	Slight	Slight	Northern red oak White oak Yellow-poplar Black walnut Black cherry Sugar maple White ash	70 70 80 --- --- --- ---	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.

See footnote at end of table.

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
EmD---------- Ellsworth	3r	Moderate	Moderate	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
						White oak----------	70	
						Yellow-poplar-------	80	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash----------	---	
FcA, FcB---------- Fitchville	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, white ash, black walnut, yellow-poplar, red pine, white oak.
						Yellow-poplar-------	80	
						Sugar maple---------	---	
						White oak----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						White ash----------	---	
GbB, GbC---------- Geeburg	2c	Slight	Slight	Moderate	Severe	White oak----------	75	Yellow-poplar, Austrian pine, green ash, pin oak, red maple.
						Black cherry--------	---	
						White ash----------	---	
						Slippery elm--------	---	
						Red maple----------	---	
GfB, GfC---------- Glenford	1o	Slight	Slight	Slight	Slight	Northern red oak----	86	Eastern white pine, red pine, yellow-poplar, black walnut, white ash, white oak, northern red oak.
						Yellow-poplar-------	96	
						White oak----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash----------	---	
HsA, HsB---------- Haskins	2o	Slight	Slight	Slight	Slight	White oak----------	75	Red maple, white ash, eastern white pine, yellow-poplar.
						Northern red oak----	80	
						Pin oak------------	90	
Ho---------- Holly	2w	Slight	Severe	Severe	Moderate	Pin oak------------	90	Red maple, sweetgum, eastern cottonwood, green ash, American sycamore, pin oak, swamp white oak.
						Swamp white oak-----	---	
						Red maple----------	---	
						Green ash----------	---	
						Black cherry--------	---	
						Eastern cottonwood--	---	
JtA---------- Jimtown	2o	Slight	Slight	Slight	Slight	Northern red oak----	85	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
						Yellow-poplar-------	---	
						Sugar maple---------	---	
						White ash----------	---	
						White oak----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
LrB, LrC---------- Lordstown	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, European larch, red pine.
						Sugar maple---------	73	
						White ash----------	75	
LxD*: Lordstown---------	3r	Moderate	Moderate	Slight	Slight	Northern red oak----	70	Eastern white pine, European larch, red pine.
						Sugar maple---------	73	
						White ash----------	75	
Rock outcrop.								
LxF*: Lordstown---------	3r	Severe	Severe	Slight	Slight	Northern red oak----	70	Eastern white pine, European larch, red pine.
						Sugar maple---------	73	
						White ash----------	75	
Rock outcrop.								

See footnote at end of table.

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
LyB, LyC---------- Loudonville	2o	Slight	Slight	Slight	Slight	Northern red oak----	80	Eastern white pine, black walnut, yellow-poplar, red pine, white ash, northern red oak, white oak.
						White oak----------	75	
						Black oak----------	---	
						Black cherry--------	---	
						Black walnut--------	---	
						White ash----------	---	
						Sugar maple---------	---	
						Yellow-poplar-------	---	
MgA, MgB, MgC------ Mahoning	2c	Slight	Slight	Moderate	Moderate	Pin oak-------------	88	Red maple, yellow-poplar, green ash, Austrian pine, pin oak.
						White oak----------	---	
						Black cherry--------	---	
						Red maple----------	---	
						White ash----------	---	
						Slippery elm--------	---	
MsA, MsB---------- Mahoning	2c	Slight	Slight	Moderate	Moderate	Pin oak-------------	88	Austrian pine, yellow-poplar, green ash, pin oak, red maple.
						White oak----------	---	
						Black cherry--------	---	
						Red maple----------	---	
						White ash----------	---	
						Slippery elm--------	---	
MtA---------- Mitiwanga	3o	Slight	Slight	Slight	Slight	Northern red oak----	70	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, white oak.
						White oak----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash----------	---	
						Yellow-poplar-------	---	
Or---------- Orrville	2o	Slight	Slight	Slight	Slight	Pin oak-------------	85	Eastern white pine, yellow-poplar, black walnut, red pine, white ash, white oak.
						Northern red oak----	80	
						Yellow-poplar-------	90	
						Sugar maple---------	80	
						White oak----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						White ash----------	---	
OsB, OsC---------- Oshtemo	3o	Slight	Slight	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, jack pine.
						White oak----------	---	
						American basswood---	66	
						Sugar maple---------	61	
PsA, PsB---------- Platea	2d	Slight	Slight	Moderate	Moderate	Sugar maple---------	80	Green ash, Virginia pine, red pine, yellow-poplar.
						Northern red oak----	80	
						White oak----------	---	
						Slippery elm--------	---	
						White ash----------	---	
						American beech------	---	
						American sycamore---	---	
ReA, ReB---------- Ravenna	2d	Slight	Slight	Moderate	Moderate	Pin oak-------------	85	Eastern white pine, yellow-poplar, green ash, Virginia pine, red pine.
						Northern red oak----	80	
						Black oak----------	80	
						Yellow-poplar-------	90	
						Sugar maple---------	85	
RmB---------- Rawson	2o	Slight	Slight	Slight	Slight	White oak----------	75	Eastern white pine, yellow-poplar, black walnut, white ash, red pine, northern red oak, white oak.
						Northern red oak----	80	
						Black walnut--------	---	
						Black cherry--------	---	
						Sugar maple---------	---	
						White ash----------	---	
						Yellow-poplar-------	---	

See footnote at end of table.

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
RsB, RsC, RsC2----- Rittman	1o	Slight	Slight	Slight	Slight	Northern red oak----	90	Yellow-poplar, black walnut, green ash, Virginia pine, white ash, red pine, eastern white pine, northern red oak, white oak.
						Sugar maple----------	70	
						White oak-----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
RsD, RsE----------- Rittman	1r	Moderate	Moderate	Slight	Slight	Northern red oak----	90	Yellow-poplar, black walnut, white ash, red pine, eastern white pine, northern red oak, white oak.
						Sugar maple----------	70	
						White oak-----------	---	
						Black walnut--------	---	
						Black cherry--------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
RsF---------- Rittman	1r	Severe	Severe	Slight	Slight	Northern red oak----	90	Yellow-poplar, black walnut, white ash, red pine, eastern white pine, northern red oak, white oak.
						Sugar maple----------	70	
						White oak-----------	---	
						Black oak-----------	---	
						Black cherry--------	---	
						White ash-----------	---	
						Yellow-poplar-------	---	
Sb---------- Sebring	2w	Slight	Severe	Moderate	Moderate	Pin oak-------------	90	Red maple, green ash, pin oak, swamp white oak, American sycamore, eastern cottonwood.
						Swamp white oak-----	---	
						Red maple-----------	---	
						Green ash-----------	---	
						Black cherry--------	---	
						Eastern cottonwood--	---	
Sf---------- Sheffield	2w	Slight	Severe	Moderate	Moderate	Pin oak-------------	85	Green ash, red maple, American sycamore, eastern cottonwood, pin oak, swamp white oak, sweetgum.
						Sugar maple----------	94	
						White ash-----------	80	
						Yellow-poplar-------	88	
						Black cherry--------	---	
						Eastern cottonwood--	---	
						Red maple-----------	---	
						Swamp white oak-----	---	
Tg---------- Tioga	2o	Slight	Slight	Slight	Slight	Northern red oak----	75	Eastern white pine, yellow-poplar, black walnut, European larch.
						Yellow-poplar-------	85	
						Sugar maple----------	67	
Wa---------- Wabasha	5w	Slight	Severe	Severe	Severe	Pin oak-------------	60	Red maple, green ash, American sycamore, eastern cottonwood, pin oak.
						Red maple-----------	---	
						Black willow--------	---	
						American sycamore---	---	
						Green ash-----------	---	
						Eastern cottonwood--	---	
WbA, WbB---------- Wadsworth	2d	Slight	Slight	Moderate	Moderate	Pin oak-------------	90	Green ash, yellow-poplar, Virginia pine, red pine.
						Northern red oak----	85	
						White ash-----------	---	
						Sugar maple----------	---	
						American beech------	---	
WuD---------- Wooster	1r	Moderate	Moderate	Slight	Slight	Northern red oak----	86	Eastern white pine, black walnut, yellow-poplar, white ash, northern red oak, red pine, black cherry.
						Yellow-poplar-------	96	
						Sugar maple----------	85	
						White oak-----------	---	
						White ash-----------	---	
						Black walnut--------	---	
						Black cherry--------	---	

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

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

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

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
BgB---------- Bogart	---	Amur honeysuckle, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum.	Red pine, white fir.	Austrian pine, Norway spruce.	Eastern white pine, pin oak.
BrF---------- Brecksville	Siberian peashrub	Silky dogwood, Amur honeysuckle, redosier dogwood, forsythia, nannyberry viburnum.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Eastern white pine	---
Ca---------- Canadice	---	Redosier dogwood, gray dogwood, silky dogwood, American cranberrybush, Amur privet.	Northern white-cedar, black willow, tall purple willow, European alder.	Pin oak, eastern white pine, Norway spruce.	---
CcA, CcB---------- Caneadea	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood, Amur privet.	Northern white-cedar, Norway spruce, tall purple willow, Austrian pine.	European alder, pin oak, eastern white pine.	---
CdB, CdC---------- Canfield	---	Silky dogwood, Amur honeysuckle, redosier dogwood, forsythia, nannyberry viburnum.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Pin oak, eastern white pine, Norway spruce.	---
Cf. Carlisle					
CnA, CnB, CnC, CoD2---------- Chili	Siberian peashrub	Amur honeysuckle, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum, American cranberrybush.	Norway spruce, red pine, jack pine.	Eastern white pine, Austrian pine.	---
CyD*: Chili----------	Siberian peashrub	Amur honeysuckle, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum, American cranberrybush.	Norway spruce, red pine, jack pine.	Eastern white pine, Austrian pine.	---
Oshtemo----------	---	Late lilac, forsythia, autumn-olive, Amur privet, American cranberrybush.	Northern white cedar, eastern redcedar, jack pine.	Eastern white pine, red pine, Austrian pine, Norway spruce.	---

See footnote at end of table.

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

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
CyF*: Chili	Siberian peashrub	Amur honeysuckle, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry, viburnum, American cranberrybush.	Norway spruce, red pine, jack pine.	Eastern white pine, Austrian pine.	---
Oshtemo	---	Late lilac, forsythia, autumn-olive, Amur privet, American cranberrybush.	Northern white cedar, eastern redcedar, jack pine.	Eastern white pine, red pine, Austrian pine, Norway spruce.	---
Da Damascus	---	Gray dogwood, redosier dogwood, silky dogwood, American cranberrybush, Amur privet.	Northern white-cedar, tall purple willow, European alder, black willow.	Eastern white pine, Norway spruce.	Pin oak.
DrA, DrB Darien	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood, hawthorn.	Northern white-cedar, white fir.	European alder, pin oak, Norway spruce.	Eastern white pine, pin oak.
EhB, EhB2, EhC, EhC2, EhD, EhD2, EhE, EhF Ellsworth	---	Silky dogwood, Amur honeysuckle, redosier dogwood, forsythia, nannyberry viburnum.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Eastern white pine, pin oak, Norway spruce.	---
EmC, EmD Ellsworth	---	Redosier dogwood, forsythia, nannyberry viburnum, silky dogwood, Amur honeysuckle.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Eastern white pine, pin oak. Norway spruce.	---
FcA, FcB Fitchville	---	Amur honeysuckle, gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, Austrian pine, tall purple willow.	European alder, Norway spruce.	Eastern white pine, pin oak.
GbB, GbC Geeburg	Siberian peashrub	Amur honeysuckle, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum, American cranberrybush.	Norway spruce, red pine.	Eastern white pine, Austrian pine.	---

See footnote at end of table.

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

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
GfB, GfC---------- Glenford	---	Silky dogwood, Amur honeysuckle, redosier dogwood, forsythia, nannyberry viburnum.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Norway spruce-----	Eastern white pine, pin oak.
HsA, HsB---------- Haskins	---	Gray dogwood, silky dogwood, redosier dogwood, American cranberrybush.	Northern white-cedar, blue spruce, Washington hawthorn.	European alder, Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Ho---------- Holly	---	Gray dogwood, redosier dogwood, silky dogwood, American cranberrybush.	Northern white-cedar, tall purple willow, European alder, black willow.	Eastern white pine, Norway spruce, Austrian pine.	Pin oak.
JtA---------- Jimtown	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, blue spruce, Washington hawthorn.	European alder, Norway spruce, Austrian pine.	Eastern white pine, pin oak.
LrB, LrC---------- Lordstown	Siberian peashrub	Autumn-olive, forsythia, lilac, Tatarian honeysuckle, nannyberry, viburnum, Washington hawthorn.	Red pine, jack pine.	Eastern white pine, Austrian pine.	---
LxD*, LxF*: Lordstown--------	Siberian peashrub	Autumn-olive, lilac, forsythia, Tatarian honeysuckle, nannyberry viburnum, Washington hawthorn.	Red pine, jack pine.	Eastern white pine, Austrian pine.	---
Rock outcrop.					
LyB, LyC---------- Loudonville	Siberian peashrub	Autumn-olive, Tatarian honeysuckle, lilac, nannyberry viburnum, forsythia, Washington hawthorn.	Red pine, jack pine.	Austrian pine, eastern white pine.	---
MgA, MgB, MgC, MsA, MsB--------- Mahoning	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, Norway spruce, blue spruce, Washington hawthorn.	European alder, pin oak, eastern white pine, Austrian pine.	---
MtA---------- Mitiwanga	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, Norway spruce, blue spruce, Washington hawthorn.	European alder, pin oak, eastern white pine, Austrian pine.	---

See footnote at end of table.

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

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
Or---------- Orrville	---	Gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, Austrian pine, blue spruce, Washington hawthorn.	European alder, Norway spruce.	Eastern white pine, pin oak.
OsB, OsC---------- Oshtemo	---	Late lilac, forsythia, autumn-olive, Amur privet, American cranberrybush.	Eastern redcedar, northern white-cedar, osage-orange, jack pine.	Eastern white pine, red pine, Austrian pine, Norway spruce.	---
Pg, Pq. Pits					
PsA, PsB---------- Platea	---	Silky dogwood, American cranberrybush, redosier dogwood, Amur honeysuckle, Amur privet.	Northern white-cedar, Norway spruce, Austrian pine, Washington hawthorn.	European alder, pin oak, eastern white pine.	---
ReA, ReB---------- Ravenna	---	Silky dogwood, American cranberrybush, redosier dogwood, Amur honeysuckle, Amur privet.	Northern white-cedar, Norway spruce, Austrian pine, Washington hawthorn.	European alder, pin oak, eastern white pine.	---
RmB---------- Rawson	---	Nannyberry viburnum, silky dogwood, forsythia, Amur honeysuckle, redosier dogwood.	Northern white-cedar, European alder, eastern redcedar, autumn-olive.	Norway spruce-----	Eastern white pine.
RsB, RsC, RsC2, RsD, RsE, RsF---- Rittman	---	Amur privet, autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum, American cranberrybush.	Norway spruce, red pine, Austrain pine.	Eastern white pine, pin oak.	---
Sb---------- Sebring	---	Gray dogwood, redosier dogwood, silky dogwood, American cranberrybush, Amur honeysuckle.	Northern white-cedar, European alder, black willow, Norway spruce.	Eastern white pine	Pin oak.
Sf---------- Sheffield	---	Gray dogwood, silky dogwood, redosier dogwood, American cranberrybush, Amur honeysuckle.	Northern white-cedar, tall purple willow, European alder, black willow, Norway spruce.	Eastern white pine	Pin oak.

See footnote at end of table.

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

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
Tg---------- Tioga	---	Autumn-olive, forsythia, Tatarian honeysuckle, nannyberry viburnum, Amur privet, American cranberrybush.	Red pine, Austrian pine.	Norway spruce.	Eastern white pine, pin oak.
Ud. Udorthents					
Ur. Urban land					
Wa. Wabasha					
WbA, WbB---------- Wadsworth	---	Amur privet, gray dogwood, silky dogwood, American cranberrybush, redosier dogwood.	Northern white-cedar, Norway spruce, tall purple willow, Austrian pine.	European alder, pin oak, eastern white pine.	---
Wc. Wallkill					
Wt. Willette					
WuD---------- Wooster	---	Arrowwood, Amur honeysuckle, autumn-olive, lilac, Tatarian honeysuckle, nannyberry viburnum, American cranberrybush.	Eastern redcedar, green ash.	Austrian pine, eastern white pine, pin oak.	---

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

TABLE 9.--RECREATIONAL DEVELOPMENT

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

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BgB Bogart	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Slight	Slight.
BrF Brecksville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Ca Canadice	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
CcA, CcB Caneadea	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
CdB Canfield	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Severe: erodes easily.	Moderate: wetness.
CdC Canfield	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Cf Carlisle	Severe: floods, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, floods.	Severe: ponding, excess humus.	Severe: excess humus, ponding, floods.
CnA Chili	Slight	Slight	Moderate: small stones.	Slight	Slight.
CnB Chili	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
CnC Chili	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CoD2 Chili	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CyD*: Chili	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
Oshtemo	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
CyF*: Chili	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Oshtemo	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Da Damascus	Severe: ponding.	Severe: ponding.	Severe: small stones, ponding.	Severe: ponding.	Severe: ponding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DrA, DrB---------- Darien	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
EhB, EhB2---------- Ellsworth	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
EhC, EhC2---------- Ellsworth	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
EhD, EhD2, EhE-------- Ellsworth	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
EhF---------- Ellsworth	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.
EmC---------- Ellsworth	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
EmD---------- Ellsworth	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
FcA, FcB---------- Fitchville	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
GbB---------- Geeburg	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
GbC---------- Geeburg	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
GfB---------- Glenford	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
GfC---------- Glenford	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
HsA, HsB---------- Haskins	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Ho---------- Holly	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
JtA---------- Jimtown	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LrB---------- Lordstown	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Moderate: large stones, thin layer.
LrC---------- Lordstown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: large stones, thin layer, slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LxD*, LxF*: Lordstown	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
LyB---- Loudonville	Slight----	Slight----	Moderate: slope, small stones, depth to rock.	Slight----	Moderate: thin layer.
LyC---- Loudonville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----	Moderate: slope, thin layer.
MgA, MgB---- Mahoning	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
MgC---- Mahoning	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness, slope.
MsA, MsB---- Mahoning	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
MtA---- Mitiwanga	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, thin layer.
Or---- Orrville	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
OsB---- Oshtemo	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----	Moderate: small stones.
OsC---- Oshtemo	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----	Moderate: small stones, slope.
Pg*, Pq*. Pits					
PsA, PsB---- Platea	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, erodes easily.	Severe: wetness.
ReA, ReB---- Ravenna	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
RmB---- Rawson	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight----	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RsB---------- Rittman	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
RsC, RsC2---------- Rittman	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
RsD, RsE---------- Rittman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
RsF---------- Rittman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Sb---------- Sebring	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, erodes easily.	Severe: ponding.
Sf---------- Sheffield	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, erodes easily.	Severe: ponding.
Tg---------- Tioga	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Ud*. Udorthents					
Ur*. Urban land					
Wa---------- Wabasha	Severe: floods, ponding.	Severe: ponding.	Severe: ponding, floods.	Severe: ponding.	Severe: ponding, floods.
WbA, WbB---------- Wadsworth	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Wc---------- Wallkill	Severe: floods, ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, floods, excess humus.	Severe: ponding, excess humus.	Severe: ponding, floods.
Wt---------- Willette	Severe: floods, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, floods.	Severe: ponding, excess humus.	Severe: ponding, floods, excess humus.
WuD---------- Wooster	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

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

TABLE 10.--WILDLIFE HABITAT

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

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BgB---- Bogart	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
BrF---- Brecksville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Ca---- Canadice	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
CcA---- Caneadea	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
CcB---- Caneadea	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CdB---- Canfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CdC---- Canfield	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cf---- Carlisle	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
CnA, CnB, CnC---- Chili	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CoD2---- Chili	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CyD*:										
Chili----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Oshtemo----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CyF*:										
Chili----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Oshtemo----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Da---- Damascus	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
DrA---- Darien	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
DrB---- Darien	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EhB, EhB2---- Ellsworth	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EhC, EhC2---- Ellsworth	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EhD, EhD2, EhE---- Ellsworth	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT-Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
EhF---- Ellsworth	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EmC---- Ellsworth	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EmD---- Ellsworth	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FcA---- Fitchville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FcB---- Fitchville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GbB---- Geeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GbC---- Geeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GfB---- Glenford	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GfC---- Glenford	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HsA---- Haskins	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
HsB---- Haskins	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ho---- Holly	Poor	Fair	Good	Good	Fair	Good	Good	Fair	Good	Good.
JtA---- Jimtown	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LrB---- Lordstown	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LrC---- Lordstown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LxD*, LxF*: Lordstown---	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
LyB---- Loudonville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LyC---- Loudonville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MgA---- Mahoning	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MgB---- Mahoning	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MgC---- Mahoning	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
MsA---- Mahoning	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MsB---- Mahoning	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MtA---- Mitiwanga	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Or---- Orrville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
OsB---- Oshtemo	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OsC---- Oshtemo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pg, Pq. Pits										
PsA---- Platea	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
PsB---- Platea	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ReA---- Ravenna	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
ReB---- Ravenna	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RmB---- Rawson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RsB---- Rittman	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RsC, RsC2---- Rittman	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
RsD, RsE---- Rittman	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
RsF---- Rittman	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Sb---- Sebring	Fair	Fair	Good	Good	Fair	Good	Good	Fair	Good	Good.
Sf---- Sheffield	Fair	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good.
Tg---- Tioga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ud. Udorthents										
Ur. Urban land										
Wa---- Wabasha	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good	Good	Very poor.	Very poor.	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
WbA---------- Wadsworth	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
WbB---------- Wadsworth	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Wc---------- Wallkill	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wt---------- Willette	Good	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
WuD---------- Wooster	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

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

TABLE 11.--BUILDING SITE DEVELOPMENT

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

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BgB---- Bogart	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Slight.
BrF---- Brecksville	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope.
Ca---- Canadice	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
CcA, CcB---- Caneadea	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
CdB---- Canfield	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
CdC---- Canfield	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: wetness, slope.
Cf---- Carlisle	Severe: excess humus, ponding.	Severe: ponding, low strength, floods.	Severe: ponding, low strength, floods.	Severe: ponding, low strength, floods.	Severe: low strength, ponding, floods.	Severe: excess humus, ponding, floods.
CnA---- Chili	Severe: cutbanks cave.	Slight----	Slight----	Slight----	Moderate: frost action.	Slight.
CnB---- Chili	Severe: cutbanks cave.	Slight----	Slight----	Moderate: slope.	Moderate: frost action.	Slight.
CnC---- Chili	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
CoD2---- Chili	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CyD*: Chili----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope.
Oshtemo----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
CyF*: Chili----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Oshtemo----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Da---- Damascus	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
DrA, DrB---------- Darien	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
EhB, EhB2---------- Ellsworth	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
EhC, EhC2---------- Ellsworth	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
EhD, EhD2, EhE---- Ellsworth	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
EhF---------- Ellsworth	Severe: wetness, slope, slippage.	Severe: slope, slippage.	Severe: wetness, slope, slippage.	Severe: slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope.
EmC---------- Ellsworth	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
EmD---------- Ellsworth	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
FcA, FcB---------- Fitchville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
GbB---------- Geeburg	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
GbC---------- Geeburg	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope.
GfB---------- Glenford	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
GfC---------- Glenford	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
HsA, HsB---------- Haskins	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
Ho---------- Holly	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods, frost action.	Severe: wetness, floods.
JtA---------- Jimtown	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LrB---------- Lordstown	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Moderate: large stones, thin layer.
LrC---------- Lordstown	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, frost action.	Moderate: large stones, thin layer, slope.
LxD*, LxF*: Lordstown--------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
LyB---------- Loudonville	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, low strength.	Moderate: thin layer.
LyC---------- Loudonville	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, low strength, slope.	Moderate: slope, thin layer.
MgA, MgB---------- Mahoning	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
MgC---------- Mahoning	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
MsA, MsB---------- Mahoning	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
MtA---------- Mitiwanga	Severe: depth to rock, wetness.	Severe: wetness.	Severe: wetness, depth to rock.	Severe: wetness.	Severe: frost action.	Moderate: wetness, thin layer.
Or---------- Orrville	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, frost action.	Severe: floods.
OsB---------- Oshtemo	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: small stones.
OsC---------- Oshtemo	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
Pg, Pq. Pits						
PsA, PsB---------- Platea	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
ReA, ReB---------- Ravenna	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
RmB---------- Rawson	Moderate: too clayey, dense layer, wetness.	Slight---------	Moderate: wetness, shrink-swell.	Moderate: slope.	Moderate: frost action.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RsB---------- Rittman	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Slight.
RsC, RsC2---------- Rittman	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope.
RsD, RsE---------- Rittman	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
RsF---------- Rittman	Severe: wetness, slope, slippage.	Severe: slope, slippage.	Severe: wetness, slope, slippage.	Severe: slope, slippage.	Severe: slope, frost action, slippage.	Severe: slope.
Sb---------- Sebring	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Sf---------- Sheffield	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Tg---------- Tioga	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Ud. Udorthents						
Ur. Urban land						
Wa---------- Wabasha	Severe: ponding.	Severe: floods, ponding, shrink-swell.	Severe: floods, ponding, shrink-swell.	Severe: floods, ponding, shrink-swell.	Severe: low strength, ponding, floods.	Severe: ponding, floods.
WbA, WbB---------- Wadsworth	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
Wc---------- Wallkill	Severe: ponding, excess humus.	Severe: floods, ponding, low strength.	Severe: floods, ponding, low strength.	Severe: floods, ponding, low strength.	Severe: ponding, floods, frost action.	Severe: ponding, floods.
Wt---------- Willette	Severe: excess humus, ponding.	Severe: floods, ponding, low strength.	Severe: floods, ponding, shrink-swell.	Severe: floods, ponding, low strength.	Severe: ponding, floods, frost action.	Severe: ponding, floods, excess humus.
WuD---------- Wooster	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

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

TABLE 12.--SANITARY FACILITIES

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

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BgB Bogart	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: small stones.
BrF Brecksville	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: area reclaim, too clayey, slope.
Ca Canadice	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
CcA, CcB Caneadea	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
CdB Canfield	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
CdC Canfield	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
Cf Carlisle	Severe: floods, ponding.	Severe: excess humus, seepage, floods.	Severe: floods, ponding, excess humus.	Severe: floods, ponding, seepage.	Poor: ponding, excess humus.
CnA, CnB Chili	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
CnC Chili	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
CoD2 Chili	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
CyD*: Chili	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Oshtemo	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage.
CyF*: Chili	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Oshtemo	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, slope.

See footnote at end of table.

TABLE 12.--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
Da Damascus	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, small stones, ponding.
DrA Darien	Severe: wetness, percs slowly.	Moderate: depth to rock.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: wetness.
DrB Darien	Severe: wetness, percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: wetness.
EhB, EhB2 Ellsworth	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
EhC, EhC2 Ellsworth	Severe: wetness, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
EhD, EhD2, EhE Ellsworth	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
EhF Ellsworth	Severe: percs slowly, slope, slippage.	Severe: slope.	Severe: slope, too clayey, slippage.	Severe: slope.	Poor: too clayey, hard to pack, slope.
EmC Ellsworth	Severe: wetness, percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, wetness, slope.	Poor: too clayey, hard to pack.
EmD Ellsworth	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
FcA, FcB Fitchville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GbB Geeburg	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
GbC Geeburg	Severe: wetness, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
GfB Glenford	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
GfC Glenford	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
HsA Haskins	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 12.--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
HsB Haskins	Severe: wetness, percs slowly.	Moderate: slope, seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Ho Holly	Severe: floods, wetness, percs slowly.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.
JtA Jimtown	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, small stones, wetness.
LrB Lordstown	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
LrC Lordstown	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
LxD*, LxF*: Lordstown	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Poor: area reclaim, slope, thin layer.
Rock outcrop.					
LyB Loudonville	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
LyC Loudonville	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
MgA Mahoning	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MgB Mahoning	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MgC Mahoning	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MsA, MsB Mahoning	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MtA Mitiwanga	Severe: depth to rock, wetness.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: area reclaim, wetness.
Or Orrville	Severe: floods, wetness.	Severe: seepage, floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness.	Poor: wetness.
OsB Oshtemo	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.

See footnote at end of table.

TABLE 12.--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
OsC--- Oshtemo	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage.
Pg, Pq. Pits					
PsA, PsB--- Platea	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
ReA, ReB--- Ravenna	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RmB--- Rawson	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
RsB--- Rittman	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
RsC, RsC2--- Rittman	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
RsD, RsE--- Rittman	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Poor: slope.
RsF--- Rittman	Severe: percs slowly, slope, slippage.	Severe: slope, wetness.	Severe: slope, slippage.	Severe: slope.	Poor: slope.
Sb--- Sebring	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Sf--- Sheffield	Severe: ponding, percs slowly.	Slight---	Severe: ponding.	Severe: ponding.	Poor: ponding.
Tg--- Tioga	Severe: floods, wetness, poor filter.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Fair: wetness, small stones.
Ud. Udorthents					
Ur. Urban land					
Wa--- Wabasha	Severe: floods, ponding, percs slowly.	Severe: floods, ponding.	Severe: floods, ponding, too clayey.	Severe: floods, ponding.	Poor: too clayey, hard to pack, ponding.
WbA, WbB--- Wadsworth	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Wc--- Wallkill	Severe: floods, ponding, poor filter.	Severe: floods, seepage, excess humus.	Severe: floods, ponding, seepage.	Severe: floods, ponding, seepage.	Poor: ponding, excess humus.

See footnote at end of table.

TABLE 12.--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
Wt Willette	Severe: floods, ponding, percs slowly.	Severe: seepage, floods, excess humus.	Severe: floods, ponding, too clayey.	Severe: floods, seepage, ponding.	Poor: too clayey, hard to pack, ponding.
WuD Wooster	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

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

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BgB---- Bogart	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BrF---- Brecksville	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ca---- Canadice	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey, thin layer.
CcA, CcB---- Caneadea	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
CdB, CdC---- Canfield	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Cf---- Carlisle	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
CnA, CnB, CnC---- Chili	Good----	Probable----	Probable----	Poor: small stones, area reclaim.
CoD2---- Chili	Fair: slope.	Probable----	Probable----	Poor: small stones, area reclaim, slope.
CyD*: Chili----	Good----	Probable----	Probable----	Poor: small stones, area reclaim.
Oshtemo----	Good----	Probable----	Probable**----	Poor: small stones.
CyF*: Chili----	Poor: slope.	Probable----	Probable----	Poor: small stones, area reclaim, slope.
Oshtemo----	Poor: slope.	Probable----	Probable**----	Poor: small stones, slope.
Da---- Damascus	Poor: wetness.	Probable***----	Probable***----	Poor: small stones, area reclaim, wetness.
DrA, DrB---- Darien	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, wetness.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EhB, EhB2, EhC, EhC2-- Ellsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
EhD, EhD2, EhE-------- Ellsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
EhF-------------------- Ellsworth	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
EmC-------------------- Ellsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
EmD-------------------- Ellsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
FcA, FcB---------- Fitchville	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
GbB, GbC---------- Geeburg	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
GfB-------------------- Glenford	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
GfC-------------------- Glenford	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
HsA, HsB---------- Haskins	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
Ho--------------------- Holly	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
JtA-------------------- Jimtown	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LrB, LrC---------- Lordstown	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
LxD*: Lordstown------------	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Rock outcrop.				
LxF*: Lordstown------------	Poor: slope, thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Rock outcrop.				
LyB, LyC---------- Loudonville	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MgA, MgB, MgC, MsA, MsB---------- Mahoning	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
MtA---------- Mitiwanga	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Or---------- Orrville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
OsB, OsC---------- Oshtemo	Good----------	Probable----------	Probable**----------	Poor: small stones.
Pg, Pq. Pits				
PsA, PsB---------- Platea	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
ReA, ReB---------- Ravenna	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
RmB---------- Rawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, thin layer.
RsB---------- Rittman	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
RsC, RsC2---------- Rittman	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
RsD, RsE---------- Rittman	Fair: low strength, wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
RsF---------- Rittman	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Sb---------- Sebring	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Sf---------- Sheffield	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Tg---------- Tioga	Good----------	Probable----------	Probable----------	Good.
Ud. Udorthents				
Ur. Urban land				
Wa---------- Wabasha	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: ponding.
WbA, WbB---------- Wadsworth	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wc---------- Wallkill	Poor: low strength, wetness, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess humus.
Wt---------- Willette	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
WuD---------- Wooster	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.

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

** Many areas are not a probable source of gravel. Onsite investigation is needed.

*** Many areas are not a probable source of sand and gravel. Onsite investigation is needed.

TABLE 14.--WATER MANAGEMENT

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

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
BgB---- Bogart	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action, slope.	Wetness----	Favorable.
BrF---- Brecksville	Severe: slope, slippage.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Ca---- Canadice	Slight----	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly---	Erodes easily, wetness, percs slowly.	Wetness, percs slowly, erodes easily.
CcA---- Caneadea	Slight----	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
CcB---- Caneadea	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
CdB---- Canfield	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
CdC---- Canfield	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
Cf---- Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Subsides, floods, frost action.	Wetness, soil blowing.	Wetness.
CnA, CnB---- Chili	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable----	Favorable.
CnC---- Chili	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----	Slope.
CoD2---- Chili	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----	Slope, droughty.
CyD*, CyF*: Chili----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----	Slope, droughty.
Oshtemo----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy, soil blowing.	Slope.
Da---- Damascus	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, frost action, cutbanks cave.	Ponding, too sandy.	Wetness.
DrA---- Darien	Moderate: depth to rock.	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
DrB---- Darien	Moderate: depth to rock, slope.	Severe: wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
EhB, EhB2---- Ellsworth	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
EhC, EhC2, EhD, EhD2, EhE-------- Ellsworth	Severe: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
EhF---------- Ellsworth	Severe: slope, slippage.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
EmC, EmD---------- Ellsworth	Severe: slope.	Moderate: thin layer, piping, hard to pack.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
FcA---------- Fitchville	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action---	Erodes easily, wetness.	Wetness, erodes easily.
FcB---------- Fitchville	Moderate: seepage, slope.	Severe: piping.	Severe: slow refill.	Frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
GbB---------- Geeburg	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
GbC---------- Geeburg	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
GfB---------- Glenford	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Frost action, slope.	Erodes easily, wetness.	Erodes easily.
GfC---------- Glenford	Severe: slope.	Severe: piping.	Severe: no water.	Frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily.
HsA---------- Haskins	Moderate: seepage.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.
HsB---------- Haskins	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.
Ho---------- Holly	Severe: seepage.	Severe: piping, wetness, seepage.	Severe: slow refill, cutbanks cave.	Floods, frost action, cutbanks cave.	Wetness, too sandy.	Wetness.
JtA---------- Jimtown	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Wetness.
LrB---------- Lordstown	Moderate: seepage, depth to rock, slope.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Depth to rock	Depth to rock.
LrC---------- Lordstown	Severe: slope.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
LxD*, LxF*: Lordstown-------- Rock outcrop.	Severe: slope.	Severe: piping, thin layer.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
LyB---- Loudonville	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Depth to rock	Depth to rock.
LyC---- Loudonville	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
MgA---- Mahoning	Slight----	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
MgB---- Mahoning	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
MgC---- Mahoning	Severe: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
MsA---- Mahoning	Moderate: depth to rock.	Moderate: thin layer, piping, hard to pack.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
MsB---- Mahoning	Moderate: depth to rock, slope.	Moderate: thin layer, piping, hard to pack.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
MtA---- Mitiwanga	Severe: seepage.	Severe: piping.	Severe: no water.	Depth to rock, frost action.	Depth to rock, wetness.	Wetness, depth to rock.
Or---- Orrville	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Floods, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
OsB---- Oshtemo	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Favorable.
OsC---- Oshtemo	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy, soil blowing.	Slope.
Pg, Pq. Pits						
PsA---- Platea	Slight----	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
PsB---- Platea	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
ReA---- Ravenna	Slight----	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
ReB---- Ravenna	Moderate: slope.	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
RmB---- Rawson	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Wetness----	Percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
RsB--- Rittman	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
RsC, RsC2, RsD, RsE--- Rittman	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
RsF--- Rittman	Severe: slope, slippage.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
Sb--- Sebring	Moderate: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Erodes easily, ponding.	Wetness, erodes easily.
Sf--- Sheffield	Slight---	Severe: piping, ponding.	Severe: no water.	Ponding, percs slowly, frost action.	Erodes easily, ponding, rooting depth.	Wetness, erodes easily, rooting depth.
Tg--- Tioga	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Erodes easily	Erodes easily.
Ud. Udorthents						
Ur. Urban land						
Wa--- Wabasha	Slight---	Severe: ponding.	Severe: slow refill.	Percs slowly, floods, ponding.	Ponding, percs slowly.	Ponding, percs slowly.
WbA--- Wadsworth	Slight---	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
WbB--- Wadsworth	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Wetness, erodes easily.
Wc--- Wallkill	Severe: seepage.	Severe: excess humus, ponding, piping.	Moderate: slow refill.	Floods, frost action.	Ponding---	Wetness.
Wt--- Willette	Severe: seepage.	Severe: ponding.	Severe: no water.	Ponding, percs slowly, floods.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
WuD--- Wooster	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, erodes easily.	Slope, erodes easily, rooting depth.

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

TABLE 15.--ENGINEERING INDEX PROPERTIES

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

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BgB---------- Bogart	0-9	Loam----------	ML	A-4	0	90-100	75-100	65-90	50-80	20-35	NP-10
	9-47	Loam, gravelly sandy loam, gravelly sandy clay loam.	CL, SC, SM, ML	A-2, A-4, A-6	0-3	80-95	50-80	45-70	30-60	20-35	3-14
	47-60	Gravelly loamy sand, gravelly sandy loam, gravelly sand.	SM, GM, SC, SM-SC	A-1, A-2, A-4, A-3	0-5	60-85	35-70	15-60	5-40	<30	NP-8
BrF---------- Brecksville	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	90-100	85-100	75-100	60-90	25-38	5-15
	8-36	Silty clay loam, shaly silty clay loam, shaly silty clay.	CL	A-6, A-7	0-10	75-95	65-95	60-95	55-85	30-46	10-24
	36-42	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ca---------- Canadice	0-10	Silt loam--------	ML, OL	A-7	0	100	95-100	85-100	65-95	40-50	10-15
	10-40	Silty clay, clay, silty clay loam.	CL, CH, MH, ML	A-7	0	100	95-100	85-100	70-95	45-65	20-30
	40-60	Silty clay, clay, silty clay loam.	CL, CH, MH, ML	A-7	0	100	95-100	85-100	70-95	45-65	20-30
CcA, CcB---------- Caneadea	0-6	Silt loam--------	CL	A-7, A-6	0	100	90-100	90-100	75-95	30-45	10-24
	6-44	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	95-100	90-100	85-100	40-60	18-34
	44-60	Silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	95-100	90-100	85-100	34-55	12-28
CdB, CdC---------- Canfield	0-9	Silt loam--------	ML	A-4	0-2	90-100	75-100	70-100	55-90	25-35	2-10
	9-25	Loam, silt loam, gravelly loam.	ML, CL, CL-ML, SC	A-4, A-6	0-3	80-100	70-95	60-90	45-85	20-38	3-16
	25-48	Loam, silt loam, gravelly sandy loam.	ML, CL, CL-ML, SM	A-4, A-6	0-3	80-95	70-90	60-85	45-80	20-35	3-14
	48-78	Loam, sandy loam, gravelly loam.	ML, CL, CL-ML, SM	A-4, A-6	0-5	80-95	70-90	60-85	45-80	20-35	2-12
Cf---------- Carlisle	0-60	Sapric material	PT	A-8	---	---	---	---	---	---	---
CnA, CnB, CnC---- Chili	0-8	Loam----------	ML, CL-ML	A-4	0	85-100	75-100	65-85	55-75	25-35	4-10
	8-37	Loam, gravelly clay loam, gravelly sandy clay loam.	ML, SM, SC, CL	A-4, A-2, A-6	0	65-100	50-80	35-70	20-65	<30	NP-12
	37-43	Very gravelly sandy loam, very gravelly loam, gravelly sandy loam.	SM, GM, GM-GC, SM-SC	A-1, A-2	0-5	45-80	35-75	25-55	15-35	<30	NP-8
	43-64	Stratified gravelly loamy sand to very gravelly sand.	GW, GM, SP, SM	A-1	5-10	30-70	25-65	10-45	2-20	---	NP
CoD2---------- Chili	0-6	Gravelly loam----	SM, ML, GM	A-4, A-2	0	65-90	55-75	35-70	15-55	<30	NP-7
	6-40	Loam, gravelly sandy clay loam, gravelly sandy loam.	ML, SM, SC, CL	A-4, A-2, A-6	0	65-100	50-80	35-70	20-65	<30	NP-12
	40-64	Stratified gravelly loamy sand to very gravelly sand.	GW, GM, SP, SM	A-1	5-10	30-70	25-65	10-45	2-20	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CyD#, CyF#:											
Chili	0-6	Gravelly loam	SM, ML, GM	A-4, A-2	0	65-90	55-75	35-70	15-55	<30	NP-7
	6-42	Loam, gravelly sandy clay loam, gravelly sandy loam.	ML, SM, SC, CL	A-4, A-2, A-6	0	65-100	50-80	35-70	20-65	<30	NP-12
	42-60	Stratified gravelly loamy sand to very gravelly sand.	GW, GM, SP, SM	A-1	5-10	30-70	25-65	10-45	2-20	---	NP
Oshtemo	0-6	Sandy loam	SM, SM-SC	A-2, A-4	0	95-100	60-95	60-70	25-40	15-25	2-7
	6-30	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	95-100	60-95	60-85	25-45	12-30	2-16
	30-44	Loamy sand	SM, SP-SM	A-2	0	85-95	60-95	55-70	10-15	---	NP
	44-66	Stratified loamy sand to gravel.	SP-SM, GP, SP, GP-GM	A-1, A-2, A-3	0-5	40-90	35-85	20-60	0-10	---	NP
Da	0-10	Silt loam	ML, CL-ML	A-4	0	80-100	70-100	70-90	60-85	25-35	4-10
Damascus	10-26	Loam, clay loam, gravelly loam.	ML, CL	A-4, A-6	0-5	70-100	65-95	60-85	55-85	25-40	3-15
	26-32	Sandy loam, gravelly loamy sand, gravelly sandy clay loam.	SM, ML, GM	A-4, A-2, A-6	0-10	50-85	45-70	40-65	30-60	20-40	NP-12
	32-60	Gravelly sandy loam, loam, gravelly loamy sand.	GM, SM, GP, SP	A-1, A-2, A-4, A-3	0-15	35-70	20-65	10-55	3-40	<30	NP-6
DrA, DrB	0-12	Silt loam	ML, SM	A-4, A-5, A-6, A-7	0	80-90	75-90	65-90	45-85	35-45	5-15
Darien	12-40	Clay loam, shaly silt loam, loam.	CL, CL-ML, SC, GM-GC	A-4, A-6	0-5	60-95	55-90	50-90	40-85	25-35	5-15
	40-55	Clay loam, shaly silty clay loam.	CL, CL-ML, SM-SC, SC	A-4, A-6	0-5	60-95	55-90	50-90	40-85	25-35	3-15
	55	Weathered bedrock	---	---	---	---	---	---	---	---	---
EhB, EhB2, EhC, EhC2, EhD, EhD2, EhE, EhF	0-9	Silt loam	CL-ML, CL, ML	A-4, A-6	0-1	100	95-100	90-100	75-90	25-40	4-14
Ellsworth	9-38	Silty clay loam, clay loam, clay.	CL, CH	A-6, A-7	0-1	95-100	90-100	85-100	80-95	35-55	14-28
	38-60	Clay loam, silty clay loam.	CL	A-6, A-7, A-4	0-2	90-100	85-100	80-100	70-95	30-45	8-22
EmC, EmD	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0-1	100	95-100	90-100	75-90	25-40	4-14
Ellsworth	8-42	Silty clay loam, clay loam, silty clay.	CL, CH	A-6, A-7	0-1	95-100	90-100	85-100	80-95	35-55	14-28
	42	Weathered bedrock	---	---	---	---	---	---	---	---	---
FcA, FcB	0-7	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	24-40	4-16
Fitchville	7-59	Silt loam, silty clay loam.	CL, ML	A-6, A-4, A-7, A-5	0	100	100	90-100	80-100	28-50	5-23
	59-69	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	60-100	20-40	3-18
GbB, GbC	0-7	Silt loam	ML, CL-ML	A-4, A-6	0	95-100	95-100	90-100	65-95	25-40	4-12
Geeburg	7-30	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	95-100	95-100	90-100	41-60	20-32
	30-60	Clay, silty clay	CH, CL	A-7	0	95-100	95-100	95-100	90-100	41-60	18-32

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
GfB, GfC--- Glenford	0-8	Silt loam---	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-100	25-38	4-14
	8-21	Silty clay loam, silt loam.	CL, CL-ML, ML	A-6, A-7, A-4	0	100	100	95-100	80-100	25-45	5-18
	21-39	Silt loam, silty clay loam.	CL, ML, CL-ML	A-6, A-4	0	100	95-100	90-100	75-100	20-40	3-18
	39-60	Stratified silty clay loam to fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	70-100	20-40	3-15
HsA, HsB--- Haskins	0-7	Loam---	CL-ML, CL	A-4, A-6	0	95-100	85-100	70-100	55-90	25-40	5-20
	7-31	Sandy clay loam, loam, gravelly sandy clay loam.	SC, CL	A-6, A-4, A-2	0	85-100	70-100	55-85	30-65	20-40	7-20
	31-60	Clay, silty clay, clay loam.	CH, CL	A-7, A-6	0	100	85-100	80-100	70-95	35-65	15-40
Ho--- Holly	0-9	Silt loam---	ML	A-4	0	90-100	85-100	80-100	70-90	25-35	3-10
	9-25	Silt loam, loam, clay loam.	ML, SM	A-4, A-6	0	85-100	75-100	70-95	45-85	20-40	NP-14
	25-60	Stratified silt loam to gravelly sand.	ML, SM, SP-SM	A-4, A-2, A-1-B	0-5	70-100	65-100	40-90	10-70	20-40	NP-10
JtA--- Jimtown	0-9	Silt loam---	ML, CL-ML, CL	A-4	0	95-100	75-100	60-95	50-80	20-30	NP-8
	9-32	Loam, fine sandy loam, sandy clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-2	0-2	75-100	55-100	45-95	30-75	25-40	4-15
	32-40	Sandy loam, gravelly loam, very gravelly loamy sand.	SM, SC, GM, GC	A-1, A-4, A-2	0-5	50-90	40-75	30-70	20-55	<30	NP-8
	40-60	Stratified gravelly loam to very gravelly sand.	SM, GM, SP, SM-SC	A-1, A-4, A-2	0-5	45-90	30-80	20-75	15-50	<30	NP-7
LrB, LrC--- Lordstown	0-5	Loam---	ML, SM	A-4	0-10	80-95	75-95	65-95	45-85	<30	NP-4
	5-30	Channery fine sandy loam, channery loam.	ML, GM, SM	A-4	5-10	65-85	50-75	50-75	40-65	<30	NP-4
	30-35	Very channery loam, channery silt loam, very channery fine sandy loam.	ML, GM, SM	A-2, A-4, A-1	5-25	40-75	30-70	25-70	15-60	<30	NP-4
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LxD*, LxF*: Lordstown---	0-6	Channery loam	ML, GM, SM	A-4	5-20	65-85	50-75	50-75	40-65	<30	NP-4
	6-21	Channery fine sandy loam, channery loam.	ML, GM, SM	A-4	5-10	65-85	50-75	50-75	40-65	<30	NP-4
	21-28	Very channery loam, channery silt loam, very channery fine sandy loam.	ML, GM, SM	A-2, A-4, A-1	5-25	40-75	30-70	25-70	15-60	<30	NP-4
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LyB, LyC--------- Loudonville	0-8	Silt loam---------	ML, CL-ML	A-4	0-1	95-100	80-100	70-95	55-90	20-35	2-10
	8-34	Loam, sandy loam, clay loam.	CL, CL-ML	A-4, A-6, A-7	0-2	90-100	80-100	65-90	50-85	25-42	6-18
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MgA, MgB, MgC---- Mahoning	0-8	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0-1	95-100	90-100	85-100	65-90	25-40	5-14
	8-36	Silty clay loam, clay loam, silty clay.	CL, CH	A-7, A-6	0-1	95-100	90-100	85-100	75-95	35-55	14-28
	36-60	Clay loam, silty clay loam.	CL	A-6, A-7	0-2	90-100	85-100	80-95	70-90	30-45	12-22
MsA, MsB--------- Mahoning	0-9	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0-1	95-100	90-100	85-100	65-90	25-40	5-14
	9-48	Silty clay loam, clay loam, silty clay.	CL, CH	A-7, A-6	0-1	95-100	90-100	85-100	75-95	35-55	14-28
	48-58	Clay loam, silty clay loam.	CL	A-6, A-7	0-2	90-100	85-100	80-95	70-90	30-45	12-22
	58	Weathered bedrock	---	---	---	---	---	---	---	---	---
MtA-------------- Mitiwanga	0-9	Silt loam---------	ML, CL-ML	A-4	0-2	90-100	80-95	70-90	50-80	25-35	4-10
	9-31	Silt loam, silty clay loam, clay loam.	CL, ML, CL-ML	A-6, A-4	0-4	80-90	75-90	65-85	50-80	20-40	3-18
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Or--------------- Orrville	0-6	Silt loam---------	ML, CL-ML, CL	A-4	0	100	90-100	85-100	60-80	22-35	4-10
	6-31	Silt loam, loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0-2	95-100	75-100	70-95	45-90	20-40	2-16
	31-60	Stratified gravelly loamy sand to silt loam.	ML, CL, SM, SC	A-4, A-2	0-2	95-100	65-100	40-85	15-75	15-35	NP-10
OsB, OsC--------- Oshtemo	0-9	Sandy loam--------	SM, SM-SC	A-2, A-4	0	95-100	60-95	60-70	25-40	15-25	2-7
	9-38	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	95-100	60-95	60-85	25-45	12-30	2-16
	38-52	Loamy sand--------	SM, SP-SM	A-2	0	85-95	60-95	55-70	10-15	---	NP
	52-66	Stratified loamy sand to gravel.	SP-SM, GP, SP, GP-GM	A-1, A-2, A-3	0-5	40-90	35-85	20-60	0-10	---	NP
Pg, Pq. Pits											
PsA, PsB--------- Platea	0-8	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0-5	95-100	90-100	85-100	80-95	22-36	4-11
	8-17	Silty clay loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6	0-5	95-100	90-100	85-100	80-95	22-40	6-20
	17-34	Silt loam, clay loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	90-100	75-95	70-90	65-90	22-40	6-20
	34-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	85-95	75-95	70-90	65-85	22-40	6-20
ReA, ReB--------- Ravenna	0-9	Silt loam---------	ML, CL-ML	A-4	0-1	90-100	80-100	70-95	60-90	25-35	4-10
	9-19	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	0-1	85-100	80-95	70-90	60-90	25-40	6-15
	19-43	Loam, silt loam, sandy loam.	CL, ML, CL-ML	A-4, A-6	0-3	85-95	75-90	65-85	50-80	20-35	3-15
	43-60	Loam, silt loam, sandy loam.	ML, CL, SM, SC	A-4, A-6	0-5	80-95	70-90	60-80	45-60	20-32	3-12

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RmB---------- Rawson	0-16	Loam----------	CL-ML, CL	A-4, A-6	0	90-100	80-100	65-100	50-100	25-40	4-16
	16-28	Clay loam, sandy clay loam, gravelly sandy clay loam.	SC, CL	A-4, A-6	0	65-100	55-95	45-90	25-75	20-40	7-20
	28-80	Clay loam, silty clay, silty clay loam.	CH, CL	A-7, A-6	0	90-100	85-100	85-100	75-95	35-65	15-40
RsB, RsC, RsC2, RsD, RsE, RsF--- Rittman	0-15	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-1	95-100	90-100	85-100	70-90	25-40	4-14
	15-25	Clay loam, silty clay loam.	CL	A-6, A-7	0-1	90-100	85-100	80-95	60-85	30-44	11-20
	25-44	Clay loam, silty clay loam, loam.	CL, ML, CL-ML	A-6, A-4	0-2	85-100	75-95	65-90	50-85	25-40	6-18
	44-60	Clay loam, silty clay loam, loam.	CL, ML, CL-ML	A-6, A-4	0-2	85-100	75-95	65-90	50-85	25-40	6-16
Sb---------- Sebring	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	85-95	20-35	3-10
	8-44	Silty clay loam, silt loam.	CL, ML	A-4, A-6, A-7	0	100	95-100	90-100	80-100	30-50	7-22
	44-60	Stratified silty clay loam to sandy loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	90-100	85-100	55-100	30-95	20-45	3-20
Sf---------- Sheffield	0-8	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-5	95-100	90-100	85-100	80-95	25-35	4-11
	8-20	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	90-100	85-100	80-95	22-40	4-20
	20-40	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	95-100	95-100	85-95	70-90	22-40	4-20
	40-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-5	85-95	80-95	75-90	70-85	22-40	4-20
Tg---------- Tioga	0-10	Loam----------	ML, SM	A-4	0	100	95-100	65-95	40-85	<15	NP-4
	10-30	Sandy loam, loam, gravelly fine sandy loam.	SM, GM, ML	A-1, A-2, A-4	0	55-100	50-100	35-90	20-80	<15	NP-2
	30-60	Loamy sand, gravelly loam, gravelly loamy sand.	GW-GM, GM, SM, ML	A-1, A-2, A-4, A-3	0-10	35-100	30-100	15-90	5-80	<15	NP-2
Ud. Udorthents											
Ur. Urban land											
Wa---------- Wabasha	0-8	Silty clay loam	CL, CH	A-7, A-6	0	100	100	90-100	80-95	35-55	15-30
	8-45	Silty clay, clay	CH, CL	A-7	0	100	100	90-100	80-100	45-65	22-35
	45-65	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	90-100	80-100	40-65	18-35
WbA, WbB---------- Wadsworth	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-1	95-100	90-100	90-100	75-90	20-35	3-12
	7-19	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0-1	95-100	90-100	80-95	70-85	30-45	12-20
	19-41	Clay loam, silty clay loam, loam.	CL, CL-ML	A-6, A-4	0-2	85-100	75-95	70-90	55-80	25-40	6-18
	41-60	Clay loam, silty clay loam, loam.	CL, CL-ML	A-6, A-4	0-2	85-100	75-95	70-90	55-80	25-40	6-16

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wc	0-7	Silt loam	ML, SM, OL	A-5, A-7	0	95-100	90-100	70-100	40-90	40-50	5-15
Wallkill	7-23	Silt loam, silty clay loam, gravelly loam.	CL, CL-ML, SM-SC, SC	A-4	0	75-100	70-100	60-100	40-90	15-25	5-10
	23-63	Sapric material, hemic material.	PT	A-8	0	---	---	---	---	---	---
Wt	0-22	Sapric material	PT	---	---	---	---	---	---	---	---
Willette	22-60	Silty clay	CL, CH	A-7	0	100	95-100	90-100	85-95	45-60	25-34
WuD	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0	90-100	80-100	70-95	50-90	25-40	4-14
Wooster	8-20	Loam, gravelly loam, silt loam.	ML, CL	A-4, A-6	0	85-100	75-100	65-95	50-90	30-40	6-15
	20-34	Loam, silt loam, gravelly loam.	CL, CL-ML	A-6, A-4	0-5	80-100	70-95	65-90	50-75	25-40	4-15
	34-60	Loam, gravelly loam, sandy loam.	ML, CL, SM, SC	A-4, A-6, A-2	0-5	75-100	60-95	45-85	30-70	20-35	3-12

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

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

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

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm^3	In/hr	In/in	pH					Pct
BgB	0-9	7-24	1.30-1.50	0.6-2.0	0.16-0.21	4.5-7.3	Low	0.32	5	5	2-3
Bogart	9-47	18-30	1.25-1.60	0.6-6.0	0.11-0.16	4.5-6.5	Low	0.32			
	47-60	4-16	---	6.0-20	0.02-0.07	5.1-7.8	Low	0.10			
BrF	0-8	15-27	1.30-1.50	0.6-2.0	0.19-0.23	3.6-5.5	Low	0.43	4	6	---
Brecksville	8-36	27-35	1.40-1.65	0.06-0.2	0.10-0.18	3.6-5.5	Moderate	0.43			
	36-42	---	---	---	---	---	---	---			
Ca	0-10	20-27	1.35-1.55	0.2-2.0	0.17-0.21	4.5-6.5	Moderate	0.49	5	---	3-5
Canadice	10-40	35-60	1.40-1.75	<0.06	0.12-0.17	5.1-7.8	Moderate	0.28			
	40-60	35-60	1.40-1.50	<0.06	0.13-0.17	6.6-8.4	Moderate	0.28			
CcA, CcB	0-6	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Moderate	0.43	3	6	2-4
Caneadea	6-44	35-60	1.35-1.70	0.06-0.2	0.10-0.13	4.5-7.8	High	0.32			
	44-60	35-55	1.45-1.75	0.06-0.2	0.10-0.14	7.4-8.4	High	0.32			
CdB, CdC	0-9	10-22	1.30-1.50	0.6-2.0	0.18-0.23	4.5-7.3	Low	0.37	4	5	1-3
Canfield	9-25	18-27	1.45-1.70	0.6-2.0	0.14-0.19	4.5-6.0	Low	0.37			
	25-48	15-27	1.60-1.90	0.06-0.2	0.07-0.10	4.5-7.3	Low	0.37			
	48-78	15-25	1.55-1.85	0.06-0.2	0.07-0.10	5.1-7.8	Low	0.37			
Cf	0-60	---	0.13-0.23	2.0-6.0	0.35-0.45	4.5-7.8	---	---	---	3	>70
Carlisle											
CnA, CnB, CnC	0-8	5-15	1.30-1.50	0.6-2.0	0.14-0.18	4.5-7.3	Low	0.32	4	5	2-3
Chili	8-37	18-27	1.25-1.60	2.0-6.0	0.09-0.16	5.1-6.5	Low	0.32			
	37-43	5-18	1.25-1.60	2.0-6.0	0.06-0.12	5.1-6.5	Low	0.17			
	43-64	1-10	---	6.0-20	0.02-0.08	5.1-7.8	Low	0.10			
CoD2	0-6	7-24	1.30-1.55	0.6-2.0	0.10-0.14	4.5-7.3	Low	0.24	4	8	1-3
Chili	6-40	18-27	1.25-1.60	2.0-6.0	0.09-0.15	5.1-6.5	Low	0.32			
	40-64	1-10	---	6.0-20	0.02-0.08	5.1-7.8	Low	0.10			
CyD*, CyF*:											
Chili	0-6	7-24	1.30-1.55	0.6-2.0	0.10-0.14	4.5-7.3	Low	0.24	4	8	1-3
	6-42	18-27	1.25-1.60	2.0-6.0	0.09-0.15	5.1-6.5	Low	0.32			
	42-60	1-10	---	6.0-20	0.02-0.08	5.1-7.8	Low	0.10			
Oshtemo	0-6	2-10	1.14-1.60	2.0-6.0	0.10-0.15	5.1-6.5	Low	0.24	5	3	.5-3
	6-30	10-22	1.20-1.59	2.0-6.0	0.12-0.19	5.1-6.5	Low	0.24			
	30-44	5-15	1.20-1.59	6.0-20	0.06-0.08	5.1-7.3	Low	0.17			
	44-66	0-15	1.20-1.47	>20	0.02-0.04	5.6-7.3	Low	0.10			
Da	0-10	10-27	1.25-1.50	0.6-2.0	0.16-0.20	4.5-6.5	Low	0.32	5	6	3-5
Damascus	10-26	10-35	1.25-1.60	0.6-2.0	0.13-0.17	4.5-6.5	Low	0.32			
	26-32	10-30	1.20-1.60	2.0-6.0	0.08-0.12	4.5-6.5	Low	0.32			
	32-60	8-18	---	>6.0	0.02-0.06	5.1-7.8	Low	0.32			
DrA, DrB	0-12	15-35	1.10-1.40	0.6-2.0	0.15-0.20	5.6-7.3	Low	0.37	3	6	1-3
Darien	12-40	28-35	1.50-1.75	0.2-0.6	0.09-0.16	5.1-7.3	Moderate	0.24			
	40-55	20-35	1.50-1.85	0.06-0.2	0.05-0.08	5.6-7.3	Low	0.24			
	55	---	---	---	---	---	---	---			
EhB, EhB2, EhC, EhC2, EhD, EhD2, EhE, EhF	0-9	16-25	1.30-1.50	0.6-2.0	0.21-0.24	4.5-7.3	Low	0.43	3	6	1-3
Ellsworth	9-38	35-45	1.45-1.75	0.06-0.2	0.12-0.16	4.5-7.8	Moderate	0.32			
	38-60	27-42	1.65-1.85	<0.2	0.06-0.10	6.6-8.4	Moderate	0.32			
EmC, EmD	0-8	16-25	1.30-1.50	0.6-2.0	0.18-0.21	4.5-6.5	Low	0.43	3	6	1-3
Ellsworth	8-42	35-45	1.45-1.75	0.06-0.2	0.12-0.16	4.5-7.8	Moderate	0.32			
	42	---	---	---	---	---	---	---			

See footnote at end of table.

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

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
FcA, FcB--------- Fitchville	0-7 7-59 59-69	16-27 20-35 16-30	1.30-1.45 1.45-1.70 1.40-1.65	0.6-2.0 0.2-0.6 0.2-2.0	0.17-0.21 0.15-0.19 0.14-0.18	4.5-7.3 4.5-7.3 5.6-7.8	Low---------- Moderate----- Low----------	0.37 0.37 0.37	5	6	2-3
GbB, GbC--------- Geeburg	0-7 7-30 30-60	22-27 42-60 42-60	1.30-1.50 1.55-1.80 1.55-1.80	0.6-2.0 <0.06 <0.06	0.18-0.22 0.09-0.13 0.06-0.10	4.5-7.3 4.5-7.8 6.6-8.4	Low---------- High--------- High---------	0.43 0.32 0.32	3	6	1-3
GfB, GfC--------- Glenford	0-8 8-21 21-39 39-60	16-27 18-35 18-35 16-30	1.30-1.45 1.45-1.68 1.45-1.68 1.40-1.60	0.6-2.0 0.2-2.0 0.2-0.6 0.2-2.0	0.16-0.20 0.14-0.18 0.13-0.17 0.12-0.17	4.5-7.3 4.5-6.0 5.1-7.3 5.6-7.8	Low---------- Moderate----- Low---------- Low----------	0.37 0.37 0.37 0.37	5	6	1-3
HsA, HsB--------- Haskins	0-7 7-31 31-60	12-20 18-35 35-55	1.30-1.45 1.45-1.70 1.60-1.80	0.6-2.0 0.6-2.0 <0.2	0.18-0.22 0.12-0.16 0.08-0.12	5.1-7.3 5.1-7.3 6.1-8.4	Low---------- Low---------- Moderate-----	0.37 0.37 0.37	4	5	1-4
Ho--------------- Holly	0-9 9-25 25-60	15-27 18-30 10-27	1.20-1.40 1.20-1.50 1.20-1.40	0.6-2.0 0.2-2.0 0.6-6.0	0.20-0.24 0.17-0.21 0.07-0.18	5.6-7.3 5.1-7.3 5.6-7.8	Low---------- Low---------- Low----------	0.28 0.28 0.28	5	6	2-5
JtA-------------- Jimtown	0-9 9-32 32-40 40-60	10-24 18-27 8-20 4-16	1.30-1.50 1.25-1.60 1.25-1.60 1.25-1.65	0.6-2.0 0.6-2.0 0.6-6.0 2.0-6.0	0.18-0.22 0.10-0.18 0.07-0.11 0.04-0.10	4.5-7.3 4.5-6.5 5.1-6.5 5.1-8.4	Low---------- Low---------- Low---------- Low----------	0.32 0.32 0.24 0.10	4	5	1-3
LrB, LrC--------- Lordstown	0-5 5-30 30-35 35	8-18 8-18 5-18 ---	1.10-1.40 1.20-1.50 1.20-1.50 ---	0.6-2.0 0.6-2.0 0.6-2.0 ---	0.13-0.20 0.10-0.16 0.05-0.14 ---	4.5-6.5 4.5-6.0 4.5-6.0 ---	Low---------- Low---------- Low---------- ---	0.28 0.28 0.28 ---	3	---	1-3
LxD*, LxF*: Lordstown------- Rock outcrop.	0-6 6-21 21-28 28	8-18 5-26 5-18 ---	1.10-1.40 1.20-1.50 1.20-1.50 ---	0.6-2.0 0.6-2.0 0.6-2.0 ---	0.11-0.17 0.10-0.16 0.05-0.14 ---	4.5-6.5 4.5-6.0 4.5-6.0 ---	Low---------- Low---------- Low---------- ---	0.20 0.28 0.28 ---	3	---	---
LyB, LyC--------- Loudonville	0-8 8-34 34	13-22 20-34 ---	1.30-1.50 1.35-1.60 ---	0.6-2.0 0.6-2.0 ---	0.16-0.20 0.14-0.18 ---	4.5-6.0 4.5-6.0 ---	Low---------- Moderate----- ---	0.32 0.32 ---	4	5	1-3
MgA, MgB, MgC---- Mahoning	0-8 8-36 36-60	19-27 35-45 27-40	1.30-1.50 1.45-1.75 1.65-1.85	0.6-2.0 <0.2 <0.2	0.18-0.22 0.13-0.18 0.06-0.10	4.5-7.3 4.5-7.8 7.4-8.4	Low---------- Moderate----- Moderate-----	0.43 0.32 0.32	3	6	2-4
MsA, MsB--------- Mahoning	0-9 9-48 48-58 58	19-27 35-45 30-40 ---	1.30-1.50 1.45-1.75 1.45-1.80 ---	0.6-2.0 0.06-0.2 0.06-0.2 ---	0.18-0.22 0.13-0.18 0.06-0.10 ---	4.5-7.3 4.5-7.8 5.1-7.8 ---	Low---------- Moderate----- Moderate----- ---	0.43 0.32 0.32 ---	3	6	2-4
MtA-------------- Mitiwanga	0-9 9-31 31	15-26 24-35 ---	1.30-1.45 1.30-1.60 ---	0.6-2.0 0.6-2.0 ---	0.17-0.21 0.13-0.17 ---	4.5-6.5 4.5-6.0 ---	Low---------- Moderate----- ---	0.32 0.32 ---	4	6	2-4
Or--------------- Orrville	0-6 6-31 31-60	12-27 18-30 10-25	1.25-1.45 1.30-1.50 1.20-1.40	0.6-2.0 0.6-2.0 0.6-6.0	0.18-0.22 0.15-0.19 0.08-0.15	5.1-7.3 5.1-6.5 5.1-7.3	Low---------- Low---------- Low----------	0.37 0.37 0.37	5	6	2-4

See footnote at end of table.

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

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
OsB, OsC	0-9	2-10	1.14-1.60	2.0-6.0	0.10-0.15	5.1-6.5	Low	0.24	5	3	.5-3
Oshtemo	9-38	10-22	1.20-1.59	2.0-6.0	0.12-0.19	5.1-6.5	Low	0.24			
	38-52	5-15	1.20-1.59	6.0-20	0.06-0.08	5.1-7.3	Low	0.17			
	52-66	0-15	1.20-1.47	>20	0.02-0.04	5.6-7.3	Low	0.10			
Pg, Pq. Pits											
PsA, PsB	0-8	15-27	1.30-1.50	0.6-2.0	0.20-0.24	3.6-6.0	Low	0.43	3-2	6	1-3
Platea	8-17	20-35	1.45-1.70	0.2-0.6	0.16-0.21	3.6-6.0	Low	0.43			
	17-34	20-35	1.60-1.90	<0.06	0.08-0.12	5.6-7.3	Low	0.43			
	34-60	20-32	1.55-1.90	0.2-0.6	0.10-0.14	7.4-7.8	Low	0.43			
ReA, ReB	0-9	15-24	1.30-1.50	0.6-2.0	0.17-0.22	3.6-6.5	Low	0.37	3	6	1-3
Ravenna	9-19	18-27	1.45-1.75	0.6-2.0	0.14-0.19	3.6-6.0	Low	0.37			
	19-43	16-27	1.60-1.90	0.06-0.2	0.06-0.10	4.5-6.5	Low	0.37			
	43-60	15-27	1.55-1.90	0.06-0.6	0.06-0.10	5.6-7.8	Low	0.37			
RmB	0-16	12-20	1.35-1.50	0.6-2.0	0.18-0.22	4.5-7.3	Low	0.32	4-3	5	1-3
Rawson	16-28	18-35	1.50-1.69	0.6-2.0	0.12-0.16	5.1-7.8	Low	0.32			
	28-80	35-55	1.60-1.82	<0.2	0.08-0.12	5.1-8.4	Moderate	0.32			
RsB, RsC, RsC2, RsD, RsE, RsF	0-15	11-27	1.30-1.50	0.6-2.0	0.18-0.22	4.5-7.3	Low	0.43	4	6	1-3
Rittman	15-25	27-35	1.45-1.70	0.6-2.0	0.14-0.18	3.6-5.0	Moderate	0.43			
	25-44	20-32	1.60-1.85	0.06-0.2	0.06-0.10	4.5-7.3	Low	0.43			
	44-60	20-30	1.55-1.85	0.06-0.6	0.06-0.10	5.6-7.8	Low	0.43			
Sb	0-8	18-27	1.30-1.45	0.6-2.0	0.18-0.22	4.5-7.3	Low	0.37	5	6	3-5
Sebring	8-44	22-35	1.45-1.70	0.2-0.6	0.14-0.18	4.5-7.3	Moderate	0.37			
	44-60	15-30	1.40-1.65	0.2-2.0	0.12-0.16	6.1-8.4	Moderate	0.37			
Sf	0-8	18-27	1.30-1.50	0.6-2.0	0.16-0.20	4.5-6.0	Low	0.37	4	6	3-5
Sheffield	8-20	25-35	1.45-1.70	0.2-0.6	0.13-0.17	4.5-6.0	Low	0.37			
	20-40	25-35	1.60-1.90	<0.06	0.08-0.12	5.6-7.3	Low	0.37			
	40-60	15-32	1.55-1.90	0.2-0.6	0.10-0.14	7.4-8.4	Low	0.37			
Tg	0-10	5-18	1.15-1.40	0.6-6.0	0.15-0.21	5.1-7.3	Low	0.37	5	---	2-4
Tioga	10-30	5-18	1.15-1.45	0.6-6.0	0.07-0.20	5.1-7.3	Low	0.28			
	30-60	3-15	1.25-1.55	0.6-20	0.02-0.20	5.6-7.8	Low	0.28			
Ud. Udorthents											
Ur. Urban land											
Wa	0-8	35-40	1.35-1.55	0.2-0.6	0.16-0.20	6.1-7.8	Moderate	0.32	5	4	3-6
Wabasha	8-45	40-55	1.35-1.65	0.06-0.2	0.12-0.16	6.1-7.8	High	0.32			
	45-65	35-55	1.50-1.65	0.06-0.2	0.12-0.17	6.1-8.4	High	0.32			
WbA, WbB	0-7	13-27	1.30-1.50	0.6-2.0	0.17-0.22	3.6-7.3	Low	0.43	4	6	1-3
Wadsworth	7-19	25-35	1.45-1.70	0.2-2.0	0.14-0.18	3.6-6.0	Moderate	0.43			
	19-41	18-32	1.60-1.85	<0.2	0.06-0.10	4.5-7.3	Low	0.43			
	41-60	15-32	1.55-1.85	0.06-0.6	0.06-0.12	5.6-8.4	Low	0.43			
Wc	0-7	10-27	1.15-1.40	0.6-2.0	0.16-0.21	5.1-7.8	Low	0.32	5	---	4-12
Wallkill	7-23	15-27	1.15-1.45	0.6-2.0	0.15-0.20	5.1-7.8	Low	0.32			
	23-63	---	0.25-0.45	2.0-20	0.35-0.45	5.6-7.8	---	---			
Wt	0-22	---	0.25-0.45	2.0-6.0	0.35-0.45	5.6-7.8	---	---	---	3	>60
Willette	22-60	40-60	1.40-1.65	0.06-0.2	0.12-0.16	5.6-8.4	High	---			
WuD	0-8	11-20	1.30-1.50	0.6-2.0	0.18-0.23	4.5-6.0	Low	0.37	4	6	1-3
Wooster	8-20	18-28	1.35-1.65	0.6-2.0	0.14-0.18	4.5-6.0	Low	0.37			
	20-34	18-28	1.55-1.75	0.2-0.6	0.08-0.12	4.5-6.0	Low	0.37			
	34-60	12-22	1.40-1.65	0.2-2.0	0.08-0.14	4.5-7.3	Low	0.37			

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

TABLE 17.--SOIL AND WATER FEATURES

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

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
BgB---- Bogart	B	None	---	---	2.0-3.5	Apparent	Nov-May	>60	---	High	Moderate	High.
BrF---- Brecksville	C	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High	High.
Ca*---- Canadice	D	None	---	---	+1-1.0	Apparent	Dec-Jun	>60	---	Moderate	High	Low.
CcA, CcB---- Caneadea	D	None	---	---	1.0-2.5	Perched	Dec-May	>60	---	High	High	Moderate.
CdB, CdC---- Canfield	C	None	---	---	1.5-3.0	Perched	Nov-May	>60	---	High	Moderate	Moderate.
Cf*---- Carlisle	D	Frequent	Long	Nov-May	+.5-1.0	Apparent	Sep-Jun	>60	---	High	High	Low.
CnA, CnB, CnC, CoD2---- Chili	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
CyD**, CyF**: Chili----	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Oshtemo----	B	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
Da*---- Damascus	B/D	None	---	---	+1-1.0	Apparent	Jan-May	>60	---	High	High	High.
DrA, DrB---- Darien	C	None	---	---	0.5-1.5	Perched	Dec-May	40-60	Soft	High	High	Low.
EhB, EhB2, EhC, EhC2, EhD, EhD2, EhE, EhF---- Ellsworth	C	None	---	---	2.0-3.0	Perched	Nov-May	>60	---	High	High	Moderate.
EmC, EmD---- Ellsworth	C	None	---	---	2.0-3.0	Perched	Nov-May	40-60	Soft	High	High	Moderate.
FcA, FcB---- Fitchville	C	None	---	---	1.0-2.5	Perched	Nov-May	>60	---	High	High	Moderate.
GbB, GbC---- Geeburg	C	None	---	---	2.0-3.5	Perched	Nov-May	>60	---	Moderate	High	High.
GfB, GfC---- Glenford	C	None	---	---	2.0-3.5	Perched	Nov-May	>60	---	High	Moderate	Moderate.

See footnotes at end of table.

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

Soil name and map symbol	Hydrologic 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				
HsA, HsB---------- Haskins	C	None--------	---	---	1.0-2.5	Perched	Jan-Apr	>60	---	High-----	High-----	Moderate.
Ho---------- Holly	B/D	Frequent----	Long------	Nov-May	0-1.0	Apparent	Dec-May	>60	---	High-----	High-----	Moderate.
JtA---------- Jimtown	C	None--------	---	---	1.0-2.5	Apparent	Dec-May	>60	---	High-----	High-----	High.
LrB, LrC---------- Lordstown	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	High.
LxD**, LxF**: Lordstown--------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	High.
Rock outcrop.												
LyB, LyC---------- Loudonville	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Moderate	High.
MgA, MgB, MgC----- Mahoning	D	None--------	---	---	1.0-2.5	Perched	Nov-Jun	>60	---	High-----	High-----	High.
MsA, MsB---------- Mahoning	D	None--------	---	---	1.0-2.5	Perched	Nov-Jun	40-60	Soft	High-----	High-----	High.
MtA---------- Mitiwanga	C	None--------	---	---	1.0-2.5	Perched	Nov-Jun	20-40	Hard	High-----	High-----	Moderate.
Or---------- Orrville	C	Frequent----	Very brief to brief.	Nov-May	1.0-2.5	Apparent	Nov-Jun	>60	---	High-----	High-----	Moderate.
OsB, OsC---------- Oshtemo	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Pg, Pq. Pits												
PsA, PsB---------- Platea	C	None--------	---	---	0.5-2.0	Perched	Jan-Apr	>60	---	High-----	High-----	High.
ReA, ReB---------- Ravenna	C	None--------	---	---	0.5-2.0	Perched	Nov-Jun	>60	---	High-----	High-----	High.
RmB---------- Rawson	B	None--------	---	---	2.5-4.0	Perched	Jan-Apr	>60	---	Moderate	High-----	High.
RsB, RsC, RsC2, RsD, RsE, RsF---- Rittman	C	None--------	---	---	2.0-3.0	Perched	Nov-May	>60	---	High-----	High-----	High.
Sb*---------- Sebring	B/D	None--------	---	---	+.5-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Moderate.

See footnotes at end of table.

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

Soil name and map symbol	Hydrologic 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				
Sf* Sheffield	D	None	---	---	+ 1-1.0	Perched	Dec-May	>60	---	High	High	High.
Tg Tioga	B	Frequent	Brief	Nov-May	3.0-6.0	Apparent	Feb-Apr	>60	---	Moderate	Low	Moderate.
Ud. Udorthents												
Ur. Urban land												
Wa* Wabasha	D	Frequent	Long	Sep-Jun	+2-1.0	Apparent	Sep-Jun	>60	---	High	High	Low.
WbA, WbB Wadsworth	C	None	---	---	1.0-2.0	Perched	Nov-Jun	>60	---	High	High	High.
Wc* Wallkill	D	Frequent	Brief to long.	Sep-Jun	+1-0.5	Apparent	Sep-Jun	>60	---	High	Moderate	Moderate.
Wt* Willette	D	Frequent	Long	Nov-May	+1-1.0	Perched	Nov-May	>60	---	High	High	Low.
WuD Wooster	C	None	---	---	>4.0	Perched	Feb-Apr	>60	---	Moderate	Low	High.

* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface of the soil. The second numeral indicates the depth below the surface.

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

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Bogart	Fine-loamy, mixed, mesic Aquic Hapludalfs
Brecksville	Fine-loamy, mixed, mesic Typic Dystrochrepts
Canadice	Fine, illitic, mesic Typic Ochraqualfs
Caneadea	Fine, illitic, mesic Aeric Ochraqualfs
Canfield	Fine-loamy, mixed, mesic Aquic Fragiudalfs
Carlisle	Euic, mesic Typic Medisaprists
Chili	Fine-loamy, mixed, mesic Typic Hapludalfs
Damascus	Fine-loamy, mixed, mesic Typic Ochraqualfs
Darien	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Ellsworth	Fine, illitic, mesic Aquic Hapludalfs
Fitchville	Fine-silty, mixed, mesic Aeric Ochraqualfs
Geeburg	Fine, illitic, mesic Aquic Hapludalfs
Glenford	Fine-silty, mixed, mesic Aquic Hapludalfs
Haskins	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Holly	Fine-loamy, mixed, nonacid, mesic Typic Fluvaquents
Jimtown	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Lordstown	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Loudonville	Fine-loamy, mixed, mesic Ultic Hapludalfs
Mahoning	Fine, illitic, mesic Aeric Ochraqualfs
Mitiwanga	Fine-loamy, mixed, mesic Aeric Ochraqualfs
Orrville	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Oshtemo	Coarse-loamy, mixed, mesic Typic Hapludalfs
Platea	Fine-silty, mixed, mesic Aeric Fragiaqualfs
Ravenna	Fine-loamy, mixed, mesic Aeric Fragiaqualfs
*Rawson	Fine-loamy, mixed, mesic Typic Hapludalfs
Rittman	Fine-loamy, mixed, mesic Aquic Fragiudalfs
Sebring	Fine-silty, mixed, mesic Typic Ochraqualfs
Sheffield	Fine-silty, mixed, mesic Typic Fragiaqualfs
Tioga	Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Udorthents	Loamy, mixed, nonacid, mesic Typic Udorthents
Wabasha	Fine, illitic, nonacid, mesic Mollic Fluvaquents
Wadsworth	Fine-silty, mixed, mesic Aeric Fragiaqualfs
Wallkill	Fine-loamy, mixed, nonacid, mesic Thapto-Histic Fluvaquents
Willette	Clayey, illitic, euic, mesic Terric Medisaprists
Wooster	Fine-loamy, mixed, mesic Typic Fragiudalfs

* 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.

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